

Sustainable Development Report on Africa

*Sustainable Consumption and Production for
Sustainable Growth and Poverty Reduction*



United Nations
Economic Commission
for Africa



United Nations
Environment
Programme



United Nations
Industrial Development
Organization



African Roundtable on
Sustainable Consumption
and Production

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Acronyms

A21	Agenda 21
AEM	African Eco-labelling Mechanism
AfDB	African Development Bank
ALSF	African Legal Support Facility
AMCEN	African Ministerial Conference on the Environment
AMV	Africa's Mining Vision
ARSCP	Africa Roundtable on Sustainable Consumption and Production
ASM	Artisanal and Small Scale Mining
ASP	African Stockpiles Programme
AU	African Union
AUC	African Union Commission
BCRC	Basel Convention Regional Centre
BRT	Bus Rapid Transit
CASM	Communities in Small Scale Mining
CDM	Clean Development Mechanism
CSR	Corporate Social Responsibility
CFL	Compact Fluorescent Lamp
CFSSD	Committee on Food Security and Sustainable Development
CP	Cleaner Production
CSD	Commission on Sustainable Development
CSR	Corporate Social Responsibility
DRC	Democratic Republic of Congo
ECA	United Nations Economic Commission for Africa
ECOSOC	United Nations Economic and Social Council
ECOWAS	Economic Community of West African States
EIA	Environmental Impact Assessment
EIR	Extractive Industries Review
EITI	Extractive Industries Transparency Initiative
EU	European Union
FAO	Food and Agriculture Organization
GDP	Gross Domestic Product
GEF	Global Environment Facility
GMP	Global Mercury Project
GRI	Global Reporting Initiative
HRD	Human Resources Development
ISWM	Integrated Solid Waste Management
IWRM	Integrated Water Resources Management
JPOI	Johannesburg Plan of Implementation
KPCS	Kimberley Process Certification Scheme
MDG	Millennium Development Goal

MEA	Multilateral Environment Agreement
MTF	Marrakech Task Force
MVA	Manufacturing Value Added
NCPC	National Cleaner Production Centre
NEAP	National Environment Action Plan
NEPAD	New Partnership for Africa's Development
NEPAD-EAP	NEPAD Environment Action Plan
NGO	Non-Governmental Organization
NSSD	National Strategy for Sustainable Development
ODA	Official Development Assistance
OECD	Organization for Economic Cooperation and Development
PAN	Pesticides Action Network
PCFV	Partnership for Clean Fuels and Vehicles
PFIA 21	Programme for the Further Implementation of Agenda 21
PGM	Platinum Group Metals
PIDA	Programme for Infrastructure Development in Africa
PPP	Public Private Partnership
PRS	Poverty Reduction Strategy
PRTSR	Poverty Reduction and Transport Strategy Review
QSP	Quick Start Programme
R&D	Research and Development
RC	Regional Commission
REC	Regional Economic Community
RECP	Resource Efficient and Cleaner Production
RIM	Regional Implementation Meeting
RIM	Regional Implementation Meeting
SADC	Southern Africa Development Community
SAICM	Strategic Approach to International Chemicals Management
SC	Sustainable Consumption
SCP	Sustainable Consumption and Production
SD	Sustainable Development
SDRA	Sustainable Development Report on Africa
SME	Small and Medium-sized Enterprise
SP	Sustainable Production
SSA	Sub-Saharan Africa
SSATP	Sub-Saharan Africa Transport Policy Programme
UN	United Nations
UNDESA	United Nations Department for Economic and Social Affairs
UNEP	United Nations Environment Programme
UNFCCC	United Nations Framework Convention on Climate Change
UNIDO	United Nations Industrial Development Organization
USOAP	Universal Safety Oversight Audit Programme
WAEMU	West African Economic and Monetary Union
WSSD	World Summit on Sustainable Development
WWF	World Wide Fund for Nature
YFP	10-Year Framework of Programmes

Acknowledgements

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Executive summary

This third issue of the Sustainable Development Report on Africa (SDRA) is a joint report of the United Nations Economic Commission for Africa (ECA), the United Nations Environment Programme (UNEP), the United Nations Industrial Development Programme (UNIDO) and the African Roundtable on Sustainable Consumption and Production (ARSCP). This issue of SDRA is produced under the theme *Sustainable consumption and production (SCP) for sustainable growth and poverty reduction in Africa*. The SCP principles that underlie the sustainable development goals and commitments on the thematic cluster of issues addressed in the report influenced the choice of theme.

The report documents progress made by African countries in the implementation of sustainable development commitments on the thematic cluster of issues comprising transport, chemicals, waste management, mining and sustainable consumption and production (SCP), including a 10-Year Framework of Programmes on SCP. It also highlights implementation challenges and constraints confronting African countries, and identifies policy measures and actions needed to accelerate implementation.

The cluster of issues addressed in the report will be considered during the Eighteenth and Nineteenth Sessions of the UN Commission on Sustainable Development (CSD), (CSD-18 and 19) in 2010 and 2011, respectively. Implementation progress was assessed taking into account the main commitments and goals contained in Agenda 21 (A21), the Programme for the Further Implementation of Agenda 21 (PFIA21), and JPOI. The assessment provided in the report is in keeping with the overall goal of SDRA production, which is to serve as an important medium for monitoring and assessing sustainable development in Africa.

The report is targeted at all relevant stakeholders, including member States, regional and subregional organizations, civil society, the private sector and development partners. The intent is to advance the actions necessary to accelerate progress towards achieving sustainable development in Africa. The report is also intended to serve as a reference document for CSD-18 deliberations.

The following are highlights of the main findings of the review.

SCP including the ten-year framework of programmes for SCP

Implementation progress and achievements

- The African Ten-Year Framework of Programmes on Sustainable Consumption and Production (10-YFP) has been launched. The 10-YFP has a strategic focus on linking SCP with the challenges of meeting basic needs in a more sustainable manner.
- A regional institutional mechanism - the Africa Roundtable on Sustainable Consumption and Product (ARSCP), which provides technical support in promoting SCP in Africa has been established.
- A number of projects are being implemented within the framework of the 10-YFP. These include the Africa Eco-labelling project, which focuses on the development of an African Eco-labelling Mechanism (AEM) and the development of national and local SCP programmes in selected countries.
- Within the context of the broader SCP goals, a number of initiatives have been or are in the process of being realized. These include the following:
 - An initial set of National Cleaner Production Centres (NCPCs) have been established in 11 countries in the region to promote Resource Efficient and Cleaner Production, with the joint support of UNEP and UNIDO;
 - Several regional energy-infrastructure projects aimed at increasing access to energy, off-grid systems based on renewable energy have been developed in the rural areas of many countries;
 - African business organizations are participating in the Global Compact initiative, which embodies social and environmental responsibility principles that are consistent with SCP goals. In addition, several companies are members of the World Business Council on Sustainable Development (WBCSD);
 - Several measures have been taken at local, national, subregional and regional levels towards increased and sustainable agricultural production. These include an increasing number of initiatives in organic food production and consumption.

Implementation challenges and constraints

The main implementation challenges and constraints are:

- Inadequate awareness and knowledge on SCP benefits, as well as limited human, technical and institutional capacities in SCP.
- Inadequate policies, strategies and legislation for SCP legislation and poor enforcement where they exist.
- Under-pricing of natural resources and low recognition of SCP in most policies; fragmented and isolated manner of implementation of SCP.
- Limited use of economic and other market-based instruments and little progress made in their application to the area of sustainable public procurement and
- Inadequate financial incentives and appropriate financing mechanisms for SCP investments and the financial and institutional instability of National Cleaner Production Centres (NCPCs), as well as the limited coverage of its network across Africa.

Lessons learned and recommended priority policy measures and actions

- Political will and commitment is essential for effective implementation of the African 10-YFP. The organizational support provided by UNEP together with the political leadership and support

provided by the African Ministerial Conference on the Environment (AMCEN) and the financial support provided by the Marrakech Task Force (MTF) on Cooperation with Africa, have been instrumental in the realization of the achievements registered so far.

- A coherent and integrated national strategy to promote SCP using a range of policies and actions, including eco-fair labelling, is needed to bring about holistic SCP patterns. Furthermore, national SCP strategies need to be formulated as integral part of National Strategies for Sustainable Development (NSSD), including Poverty Reduction Strategies (PRSs) and National Environment Action Plans (NEAPs).
- The effective development and implementation of SCP in African countries could be significantly facilitated through the mainstreaming of SCP into the priorities and decision-making criteria of development financing agencies.
- Visible implementation of SCP activities at an early stage is important to demonstrate and popularize the concept of SCP.
- In order to make further progress on sustainable lifestyles, there is a need for massive multimedia education and awareness campaigns to inspire actions for change to sustainable lifestyles. Mobilization and active involvement of the private sector, non-governmental organizations (NGOs) and other civil society organizations (CSOs) is vital in strengthening advocacy and investments in SCP initiatives.
- NCPCs need to be upscaled and their networks expanded to cover the whole continent. Moreover, resource-efficient and cleaner production needs to be mainstreamed into national development programmes as a way of fostering sustainable development.
- A bold global Ten-Year Framework of Programmes with concrete means of implementation should be established to support regional, national and local actions.

Chemicals

Implementation progress and achievements

- Most African countries have acceded to or ratified the four main international conventions on chemicals, namely:
 - The Basel Convention on the Control of Trans-boundary Movements of Hazardous Wastes and their Disposal
 - The Stockholm Convention on Persistent Organic Pollutants (POPs)
 - The Vienna Convention for the Protection of the Ozone Layer
 - The Montreal Protocol on Ozone Depleting Substances, and
 - The Rotterdam Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade.
- The Strategic Approach to International Chemicals Management (SAICM), which has been endorsed by AMCEN, is providing the policy framework and integrated approach to foster the sound management of chemicals in the region. The region has developed and adopted a regional plan of action, established a SAICM coordinating mechanism, i.e. the African Core Group with a view to facilitating regional implementation. Many countries have embarked on its implementation, with funding from the SAICM Quick Start Programme (QSP).
- Many African countries have put sector policies and institutions in place for sound management of chemicals.
- The Basel Convention Regional Centres have been put in place and are providing capacity-building support and they foster subregional and regional cooperation in chemicals management.
- The African Stockpiles Programme (ASP), which is supported by the Global Environment Facility (GEF), is active in supporting sound management of obsolete stocks of pesticides.

- Africa has made progress in phasing out leaded petrol. This phase out has been facilitated by the Clean Air Initiative for Sub-Saharan Africa and UNEP's Partnership for Clean Fuels and Vehicles (PCFV).
- NCPCs have been established in some countries to among other things, support the introduction of sound chemicals management practices and techniques in particular in the private sector.

Implementation challenges and constraints

- Inadequate awareness of possible risks posed by chemicals among major segments of the African population. This is further complicated by the general lack of reliable data and information on toxicity and safe use and disposal practices for chemicals.
- Lack of comprehensive chemicals policy, insufficient enforcement of legislation to improve sound chemicals management and poorly defined roles of various stakeholders hinder the sound management of chemicals. Inadequate financial and human resources and insufficient political support hamper the development of chemicals policy, including the implementation of SAICM.
- Most African countries still lack the institutions and facilities to monitor chemicals, in particular hazardous chemicals, and hence the capacity to develop appropriate control strategies to prevent adverse impacts on human health and the environment.
- Limited capacity in African countries to effectively participate and engage in negotiations on international chemicals and other environmental agreements is complicated by the proliferation of meetings under the various MEAs, for which preparations and participation by African countries are mostly inadequate.
- Insufficient cooperation in the development and transfer of appropriate, accessible and affordable technology of safe chemical substitutes and in the development of production capacity. Progress in defining national, subregional, regional and international best available technologies/safe chemical alternatives has been too slow to address the chemicals management challenges in Africa.

Lessons learned and recommended priority policy measures and actions

- More support is needed to enable countries of the region access environmentally sound technologies and safe chemicals. Institutions of higher education and technical and research institutions should play a significant role in adopting and replicating environmentally sound technologies on chemicals.
- Regional centres, including laboratories, should be strengthened to enable them fulfil their mandate, particularly in capacity-building, information generation and dissemination and sharing of best practices.
- A strong emphasis should be placed on the integration of sound management of chemicals into national policies for economic growth and poverty reduction. Mechanisms need to be strengthened to ensure the promotion of sound chemicals management, including in relation to the production and use of chemicals as an integral part of agricultural modernization and sustainable development.
- There is an urgent need to invest in facilities and institutions for monitoring and evaluating key chemicals in the African environment as a basis for national, subregional and regional priority setting for chemicals management. This needs to be accompanied by proper mechanisms for information exchange among African countries, building upon existing initiatives such as the Pesticide Action Network (PAN) and its database, and the Chemical Information Exchange Network (CIEN).
- Greater emphasis should be given to the involvement of the private sector, civil society, farmers and community groups, research and education institutions, (including the cleaner production centres and related service providers), in the design and implementation of chemicals management policies and strategies.

- SAICM implementation should be promoted for chemicals policy and management, taking due consideration of existing national policies, institutions and chemicals profiles. More emphasis needs to be placed on strengthening the appropriate formal institutional frameworks needed and enhanced coordination of action at national and subregional levels, with the involvement of all relevant stakeholders.
- There is an urgent need to further pursue and implement integrated approaches in implementing MEAs and other international regimes that are providing support to African countries in their efforts to achieve sound management of chemicals.

Waste management

Implementation progress and achievements

- Most African countries have ratified or acceded to relevant international instruments, including the Basel Convention. In addition, African countries have adopted the Bamako Convention on the Ban of the Import into Africa and the Control of Transboundary Movement and Management of Hazardous Wastes within Africa. However, only 27 countries have ratified or acceded to it.
- The Protocol on Liability and Compensation for Damage Resulting from Transboundary Movements of Hazardous Wastes and their Disposal was adopted in Basel in 1999. To date, only nine countries have ratified or acceded to the Protocol, seven of which are from Africa.
- Many countries in the region have made progress in formulating and adopting waste management policies, legislation and strategies aimed at minimizing the generation of waste and ensure sound management of waste. Several countries have introduced integrated waste management strategies that incorporate reuse and recycle principles.
- Some countries have implemented several programmes on waste management, towards the attainment of the MDG targets on sanitation.
- Some countries have made progress towards formalizing waste management initiatives, including through community-based approaches, such as waste recycling projects aimed at poverty reduction, and job creation. This is mostly true for industrial waste, and to a lesser extent for municipal waste. In this regard, many African countries have recycling initiatives, especially for paper, plastics, scrap metals and glass. Furthermore, some countries have started banning the use of specific disposable products such as plastics.
- The resource-efficient and cleaner production (RECP) approach has proven to be a feasible best practice for reducing wastes from businesses and other organizations in different parts of Africa and is now being promoted through the network of NCPCs.
- The application of advanced small-scale digesters to produce biogas, compost fertilizer and/or animal feed from organic waste fractions have been widely accepted in Africa as best practices, and progress is being made in developing and implementing specific projects in various countries.
- Several African countries have embarked on energy production (including co-generation from agricultural residues such as “bagasse”, straw, sawdust, and cotton and coffee husks).
- Production of ethanol from some organic wastes, for example molasses, is widespread, and further opportunities are available for other organic wastes, such as rice straw and carbon dioxide recovery from ethanol production.
- Progress is being made in ensuring sound treatment of hazardous waste by establishing appropriate facilities such as incinerators for hospitals, and secure landfills.

Implementation challenges and constraints

- The single largest implementation challenge remains creation of sufficient capacity for sound management of waste and the implementation of activities for appropriate recovery and recycling

of various waste streams across Africa. For example, Africa still almost exclusively relies on land disposal of wastes. Few sanitary landfills have been established and are operational. Progress towards overcoming this challenge is constrained by access to finance, data and technical capacity.

- Inadequate awareness and appreciation of best practices for environmentally-sound management of waste is a major constraint, which calls for a paradigm shift towards disseminating more information and enhancing the awareness of the general public and concerned communities.
- Implementation and enforcement of waste regulations and conventions are severely constrained by issues related to good governance and transparency in the management of wastes.
- Current by-laws in most countries in Africa put responsibility for waste management on municipalities, which are insufficiently equipped to deal with collection, transportation and disposal.
- Importation of second-hand consumer goods, and the production and/or importation of substandard products all contribute to rapid increase in waste generation and its complexity.

Lessons learned and recommended priority policy measures and actions

- Comprehensive policies for integrated waste management, should be developed and implemented, including where necessary creation and strengthening of relevant institutions for monitoring and enforcement.
- There is ample evidence that waste reduction is possible and often profitable, through process and operational changes and waste segregation at the source of the waste, as well as in enterprises, households or farms. Waste management policies and strategies should therefore provide incentives for waste reduction, as reduction of the volume or its complexity is fundamentally the preferred waste management strategy (prevention principle).
- The current waste management experience demonstrates that formal organizations alone cannot deal adequately with the increasing volumes and complexity and diversity of urban wastes. Integration and coordination of waste management plans among different sectors and levels of government and with stakeholders in the private sector and civil society is essential to achieve waste reduction. A partnership approach (including for example, Private-Public Partnerships (PPPs)) should therefore be considered.
- The involvement of the private sector and partnerships with local communities in solid waste management activities have created employment and job opportunities to a substantial number of jobless city residents, many of whom were previously unemployed women and youths. This involvement needs to be enhanced and access to managerial and technical know-how and finance, improved.
- The capacity of Environmental Agencies and Local Authorities should be strengthened to enhance participation of stakeholders in the implementation of the waste management plans. It is important to promote and improve the ongoing training of various stakeholders on environmentally sound management of wastes using the existing institutions and by integrating it into curricula at different school levels.
- Some cities have sound refuse collection systems in place, which forms a good source of income for city and municipal councils. Exchange of knowledge and experience in Africa on successful experiences in this regard should be promoted to enable replication.
- African countries need to prepare inventories of hazardous wastes and contaminated sites. Comprehensive inventories of hazardous and radioactive wastes and of sites potentially affected by poor management of such wastes or chemicals are required to secure sites and minimise risks to humans and the environment.
- The development and dissemination of appropriate technologies and practices for environmentally sound management of various waste streams needs to be accelerated. Multi-sectoral plans are needed to spearhead the development and dissemination of appropriate technologies and practices

for environmentally sound management of wastes. Application of various economical, efficient, cost effective and environmentally friendly waste recovery techniques and technologies should be adopted as ways of disposing wastes.

- It is important for the those African countries that have not yet ratified the Multilateral Environmental Agreements for hazardous waste (including Basel and Bamako Convention) to do so in order to achieve their aims and objectives through domestication of the provisions in national legislation and preparation and implementation of National Implementation Plans. Challenges around the ratification and eventual implementation of the Bamako Convention and the Protocol on Liability and Compensation of the Basel Convention need to be addressed at various levels through the African Union.

Mining

Implementation progress and achievements

- Most mining countries in Africa have reviewed and amended their mining frameworks and codes in the last 20 years to reflect a shift from government as an owner/operator to government as regulator/administrator, with the private sector assuming the lead in mining projects. At subregional level, efforts to harmonize mining codes have increased, emphasizing the need for transparent and efficient regulatory frameworks.
- Dialogue and consensus building on mining frameworks has been facilitated through regional forums such as the Big Table on “Managing Africa’s Natural Resources for Growth and Poverty Reduction convened by ECA in 2007. The outcomes of the big table triggered other initiatives including the Extractive Industries Transparency Initiative (EITI++), the African Legal Support Facility (ALSF), and the International Study Group (ISG) to Review Africa’s Mining Regimes.
- Through a technical task force of the ISG, the Africa Mining Vision (AMV) has been formulated and adopted by the African Union. The vision advocates for “transparent, equitable and optimal exploitation of mineral resources to underpin broad-based sustainable growth and socio-economic development”.
- African countries are signing up to global voluntary initiatives to enhance transparency and accountability in the mining sector. These initiatives include the EITI, the Global Reporting Initiative (GRI), the Kimberly Process Certification Scheme (KPCS), and the Extractive Industries Review (EIR).
- Generally, there is improvement in the participation by local communities in mining projects and in benefits accruing to communities, which have been facilitated by international schemes on corporate social responsibility.
- Significant strides have been made at national level to include environmental and social requirements in African mining regimes. The legislative regimes emerging in most countries now include requirements for environmental assessments, although less so for social impacts.
- Support for value addition to artisanal and small-scale mining (ASM) mineral products, mostly gold and gemstones, is slowly improving, including many countries in the region. Through ASM technology centres, several countries are providing a range of support facilities. There has also been an increase in programmes to address the challenges (technical, economic, social, gender and environmental) associated with the ASM sector.

Implementation challenges and constraints

- Institutional and human capacities for regulating and managing the sector are weak, especially those related to administrative, technical, training and financial functions. There is inadequate capacity to

monitor compliance with legislative requirements, especially the technical and business reporting requirements, and environmental and social management plans.

- The existing fiscal instruments do not optimize the collection of resource rents, such as windfall and additional profit taxes. Negotiating these with major mining companies continues to pose transparency challenges.
- There is inconsistency in the existence and/or application of instruments and systems to ensure the effective participation of impacted communities and other stakeholders in mining operations.
- Implementation of provisions for both social and environmental rehabilitation funds embedded in legislation presents capacity challenges to governments. Mechanisms to identify and settle mineral-related conflicts and disputes, including addressing social, economic and religious concerns, are lacking.
- There is a dearth of venture capital sources for African entrepreneurs to enter the mining sector. This limits effective participation of communities and other stakeholders in mining operations.
- Creating direct and in-direct linkages with the rest of the economy remains elusive. Direct up-, down-, and side-stream linkages into mining inputs, beneficiation and human as well as physical infrastructure are needed.
- Overcoming the large mining infrastructure financing constraints through public-private partnerships (PPPs) and the grouping of infrastructure users to achieve economies of scale via integrated development corridors remains a major challenge.
- There have been increased levels of environmental destruction occasioned by weak closure and post-closure provisions leading to an increased number of abandoned or “orphan” mining sites in Africa.

Lessons learned and recommended priority policy measures and actions

- African countries are urged to invest in new forward-looking, development-oriented mining regimes that create equitable and sustainable mineral wealth from a diversified mining industry that is integrated into the local, national and regional economy. Furthermore, with increased mining along the coast and on the sea bed, African countries should look at a regulatory framework to deal with off-shore and coastal mining.
- Governance systems in the mining sector need to be rooted in broader participation by local communities in mining decisions that affect them. Countries should therefore establish and strengthen legislative instruments and systems to ensure the effective participation of affected communities and other stakeholders. At the pan-African level, and through the AUC and ECA, a multi-stakeholder forum should be established to ensure inclusive participation in mineral development debates.
- The “polluter pays” principle is insufficiently ingrained and enforced in environmental legislation in some African countries. For this reason, emphasis should be placed on this principle in environmental laws to promote remediation/ rehabilitation of mining sites. Additionally, countries should ensure that environmental-impact assessments (EIAs) are mandatory and part of legislation, mining concessions or mineral development agreements, and that they include obligatory social and environmental rehabilitation funds.
- Infrastructural costs should be shared with other economic activities. Capacity should be developed for resource-based development corridors that optimize the collateral use of mining infrastructure, including transport, power and water, to establish economic activity in other sectors, such as agriculture, forestry and resource processing.
- Enhanced support for regional cooperation for geo-mapping and resource-development corridors, especially in respect of power projects; strengthen capacity for negotiating large mining infrastructure-financing projects; enhance capacities to boost environmental and social management practices;

and assist small-scale mining ventures to promote sustainable and commercially viable mining practices.

- Countries need to invest in appropriate knowledge-creating capacities including human resources, research infrastructure and innovation systems to support the creation of value and extend linkages to the rest of the economy. In order to address the deficiencies in skills, finance, marketing and technology faced by ASM, member countries need to put in place ASM regimes and assistance programmes that facilitate maximization of the contribution of the sector to rural development strategies and poverty alleviation in an environmentally sustainable manner.
- In order to prevent mining legacies, abandoned and/or orphaned mining sites, mine water problems, accumulation of waste and pollution, more R&D needs to be promoted to ensure that enforcement and compliance approaches are put in place. R&D is also essential for mine closure and dealing with mining legacies where programmes and initiatives should be undertaken by government, industry and other stakeholders.
- The number of industrial accidents resulting in serious negative environmental health, social and economic impacts in mining communities is increasing. There is therefore a need to enhance the capacity of the mining sector to develop and implement industrial accident prevention and preparedness strategies and plans.
- Countries should seriously consider the adoption and application of the minerals conventions emanating from the KPCS, EITI, EITI++ as well as other systems such as ICMC toolkits, legislation and industry codes for hazardous substances, such as mercury and cyanide.

Transport

Implementation progress and achievements

- Integration of transport sector strategies into poverty reduction goals through the Poverty Reduction and Transport Strategy Review (PRTSR) is underway in over thirty African countries under the Sub-Saharan Africa Transport Policy Programme (SSATP).
- To ensure integrated development of Africa's infrastructure and avoid duplication of efforts, AUC, AfDB and the NEPAD Secretariat have embarked on a joint initiative known as the Programme for Infrastructure Development in Africa (PIDA).
- There have been a number of regional and subregional meetings that have resulted in many declarations and resolutions and plans of action aimed at developing and improving the operations of transport in Africa.
- With respect to transport facilitation in Africa, a multitude of international and bilateral agreements and protocols aimed at simplifying and harmonizing trade and transport between States have been signed. Subregional conventions and protocols have been adopted, many of which are being implemented.
- Some progress has been made to enhance safety in air transport through the Universal Safety Oversight Audit Programme (USOAP).
- To combat the increasing threat of maritime piracy in the Horn of Africa and the Gulf of Aden, many governments, in cooperation with IMO, are taking steps, which include developing a code of conduct aimed at combating acts of piracy and armed robbery against ships, adopted following a high-level meeting held in Djibouti on 26 January 2009.
- Africa has succeeded, albeit in a limited way, in mobilizing resources from the public sector, the private sector and external development partners to finance transport infrastructure and operations. Countries are investing in transport infrastructure development, including roads, railways, airports and seaports. However, the region is still lagging behind in developing sustainable transport.
- An energy-efficient mass public transport system known as Bus Rapid Transit (BRT) was recently introduced in Africa. The BRT simulates a mass transit using exclusive right of way lanes.

- Some countries in the region under the Access Africa Programme, are implementing bicycle transport initiatives as a way of exploring the potential of low cost and low carbon mobility, as a way to promote environmentally friendly cities.
- Measures have been undertaken to establish and restructure road agencies and road funds, as well as to enhance the capacity of local governments to effectively coordinate rural transport infrastructure and services.
- Most African countries had phased out leaded gasoline by the end of 2008. Countries are also reducing sulphur levels in diesel fuels by introducing cleaner vehicle regulations, particularly age limitation and fuel efficient vehicles.

Implementation challenges and constraints

- Inadequate policies and strategies as well as the slow implementation of subregional and regional agreements remain major obstacles to the development of sustainable transport in Africa. Many African countries do not have policies that facilitate private sector participation in transport infrastructure development and operation.
- Liberalization and privatization in rail, air and maritime transport is still in its infancy. Efforts to harmonize policies and regulations pertaining to cross-border movement of goods, services and people have not been wholly effective.
- Transport data and information in Africa is limited and poorly organized. At the same time, there is inadequate utilization of ICTs across the continent.
- The number of workers in African public transport enterprises and agencies is relatively high, but the availability of skilled personnel is still limited in most transport industries. Moreover, in many countries there is lack of institutions equipped with appropriate powers and technical capacity to formulate, plan and manage infrastructure development and services as well as to monitor and enforce policies and regulations.
- Transport networks in Africa are inadequate, which limits connectivity, accessibility and trade within the region. Transport costs in Africa are among the highest in the world. Transport services are unaffordable to many African citizens as transport costs are high compared to the average incomes of the citizens. Limited skills of managerial and operational staff as well as poor transport infrastructure and facilitation play significant roles in the high transport costs in the region.
- The prevailing poor state of road safety remains a serious challenge in Africa, as accidents and the resulting loss of life and destruction of property has assumed intolerable proportions. A major weakness in this area is the paucity of lead institutions that are responsible for road safety. Coupled with this, there appears to be a lack of consistent enforcement of traffic regulations. Additionally, the prevention and mitigation of its environment impacts remains a challenge.
- Many gaps remain between the demand and available financial resources for sustainable transport development.

Lessons learned and recommended priority policy measures and actions

- National policies should be reviewed and harmonized with global and regional policies and agreements to facilitate the reflection of regional and global level decisions in national policies, budgets and development plans. Furthermore, countries should ensure that appropriate institutional frameworks that clearly delineate regulatory and operational functions of all modes of transport are put in place.
- Thorough social and environment impact mitigation measures should be incorporated and enforced in the development of infrastructure. In addition, there is a need for countries to take further measures to minimize emissions and promote development of environment-friendly transport systems in Africa.

- Countries need to develop policies that promote energy efficiency. Among others, such policies should aim to promote the importation of energy-efficient vehicles; promotion of use of clean fuels; limit the age for imported second-hand vehicles; and improve traffic management.
- Transport costs can be optimized through the full implementation of transport facilitation initiatives; and promoting intra-modal, inter-modal transport competition, as well as multi-modal transport systems, to improve efficiency.
- In order to promote safety in the transport sector, countries need to prioritize road safety programmes and allocate adequate funds for these programmes. Countries should also ensure compliance with safety regulations and standards established by the relevant regional and international bodies, in particular the International Civil Aviation Organization (ICAO) with regard to air transport. Furthermore, countries need to strengthen capacity to address maritime security problems, particularly in relation to the escalation of maritime piracy in recent years, in a holistic manner, including through an in depth look at the root causes of piracy.
- Information communication technology (ICT) offers a powerful tool in accessing, processing and disseminating large volumes of information in the shortest time possible and should thus be utilized by the transport sector.
- To secure sufficient finance for the development and maintenance of transport infrastructure, countries should enhance public sources of financing by ensuring that an adequate share of GDP is allocated to the sector from public funds, and also by taking advantage of resources from multilateral and bilateral donors, as well as other innovative funding mechanisms.
- As Africa's financial resources are limited in comparison to its huge infrastructure financing needs, its development partners are called upon to continue providing sufficient development assistance and honour their commitments despite the current global economic crisis.

Inter-linkages and cross-cutting issues

Implementation progress and achievements

- Mechanisms and frameworks such as the African 10-Year Framework of Programmes on SCP, Strategic Approach for Integrated Chemicals Management, Integrated Waste Management, Transport and Mining that seek to promote integrated and resource use efficiency have been adopted and are being promoted. PIDA stands among the other notable initiatives and aims to ensure integrated development of Africa's infrastructure and to avoid duplication of efforts.
- Some progress is being made towards policy and programme integration mainly within the framework of Poverty Reduction Strategies (PRSs), national sustainable development strategies and sector-wide approaches (SWAPs). SAICM and National SCP programmes are the other tools being promoted in the region for integrated programme development and implementation.
- A wide range of policies and legislation formulated in the recent past provide for transparent governance and multi-stakeholder participation including consideration of gender concerns in policy and programme formulation and implementation. As such there has generally been improvement in community participation programme development and implementation.
- The region has made some progress in putting in place structures and frameworks which are important to enhance regional cooperation in a wide range of areas pertinent to the issues under consideration, including the NEPAD programme of the AU, as well as other regional frameworks. In addition, African ministerial conferences or councils and other mechanisms have been put in place for policy and programme coordination and advocacy in the region.
- Agricultural waste such as bagasse, straw, sawdust, and cotton and coffee husks is being used by several African countries for energy production including co-generation. Some countries are taking advantage of the co-funding opportunities provided by the clean development mechanism (CDM) of the Kyoto Protocol of the UN Framework Convention on Climate Change (UNFCCC).

- Several countries in the region have initiated the development of cleaner energy sources and measures for improvement of energy efficiency.

Implementation challenges and constraints

- Inadequate institutional, human and/or financial resources capacities continue to be a major contributing factor to the slow rate of implementation of national policies and legislation as well as international regimes on issues under review, the implementation gap is widening and crippling the achievement of the desired sustainable development objectives.
- Compartmentalized approaches still prevail in the implementation of global, regional and national initiatives. These approaches result in poor coordination, duplication and strain on the limited resources.
- The region is confronted with systemic challenges such as inadequate capacity for monitoring, and research and development (R&D). There is poor dissemination of the limited data and information collected. Opportunities to facilitate knowledge, including the use of indigenous knowledge systems, and best practice sharing are limited.
- Lack of national cleaner production centres in many African countries is hampering the promotion of resource efficient and cleaner production (RECP) in various sectors as well as the sound management of chemicals and waste.

Lessons learned and recommended priority policy measures and actions

- Understanding and appreciation of the various policies, strategies by the political leadership is crucial in generating political will and commitment, which is essential in ensuring effective implementation of strategies. There is therefore need for effective communication strategies to enable the political leadership understand and appreciate strategies and programmes such as the 10-YFP on SCP.
- There is a need to design, promote and strengthen appropriate economic, financial, as well as market-based instruments for sound chemicals management, sustainable transport development, waste minimization, mining and SCP.
- Integrated initiatives and approaches such as regional and national SCP programmes, SAICM, environmental and social management plans, as well as integrated transport master plans provide a unique opportunity for tackling cross-cutting issues and challenges in a holistic and optimal manner. Emphasis should therefore be placed on developing such integrated programmes and ensuring that priority national development strategies incorporate these initiatives. In this regard, capacity for integrated analysis, policy development, planning and implementation needs to be strengthened at national and sub-national levels. Additionally, harmonization of policies and programmes across countries in the region needs to be scaled up.
- The information and knowledge base for planning, implementation, monitoring and evaluation needs to be strengthened. The capacity for research, documentation and dissemination of reliable data, information and best practices at national and regional level should therefore be enhanced. Capacity-building programmes need to be developed and implemented to upgrade the knowledge, including the use of indigenous knowledge systems, and skills of staff involved in policy formulation, planning and implementation as well as those engaged in regulatory and enforcement functions.
- Existing national cleaner production centres should be scaled up. The centres should also be expanded to countries where they do not exist, as a platform for development and implementation of appropriate programmes in RECP, including sound management of chemicals and waste.
- Mobilizing resources from both national and official development assistance (ODA) sources needs to be strengthened to ensure substantially scaled up and sustained resources provision for the implementation of programmes at regional, subregional and national levels. Incentives should be

developed and implemented to encourage and attract the private sector to invest in the development of clean and efficient energy, sustainable transport systems, sound management of chemicals and waste technologies, development of national content for the mining sector and infrastructure.

- Cooperation in development, transfer, adaptation and diffusion of appropriate and affordable technologies, particularly energy-efficient technologies, safe chemical alternatives and cleaner technologies needs to be strengthened. Moreover there should be enhanced information exchange on such technologies.

Introduction



1.1 Background

Achieving a better quality of life for the people of Africa is a fundamental goal of all countries in the region. This is exemplified in the adoption and implementation by countries, of strategies for sustained economic growth, poverty reduction and attainment of the Millennium Development Goals (MDGs). However, the challenge confronting most countries is to pursue development initiatives in a manner that decouples environmental degradation from economic growth and poverty reduction. Adopting sustainable consumption and production (SCP) policies and practices, presents countries with an effective response to this challenge.

The pursuit of such SCP policies and practices is consistent with the call made by the United Nations Conference on Environment and Development (UNCED), held in Rio de Janeiro, Brazil, 1992, for countries to promote patterns of consumption and production that reduce environmental stress and meet the basic needs of humanity. As a basis for action, Agenda 21 (A21), the action plan adopted at UNCED, states that while poverty results in certain kinds of environmental stress, the major cause of the continued deterioration of the global environment is the unsustainable pattern of consumption and production, particularly in industrialized countries. It highlighted this as a major challenge that aggravates poverty and imbalances. Therefore, A21 stresses that measures to be undertaken at the international level for the protection and enhancement of the environment, must fully take into account the current imbalances in the global patterns of consumption and production.

The World Summit on Sustainable Development (WSSD) recognized that a fundamental change in the way societies produce and consume is indispensable for achieving sustainable development. The Summit provided the momentum to address unsustainable consumption and production patterns. In this regard, the Johannesburg Plan of Implementation (JPOI), which was the main outcome of the Summit, stipulates key actions that countries should undertake in order to promote sustainable consumption and production (SCP) patterns.

Sustainable consumption and production entails the use of services and related products to meet basic needs and bring about a better quality of life, while minimizing the use of natural resources and toxic materials, as well as the discharge of wastes and pollutants over the life cycle of the service or product, so as not to jeopardize the needs of future generations (UNEP 2009). SCP goals, which include addressing basic needs and decoupling environmental degradation from development, are supportive of development aspirations of African countries of attaining sustained economic growth, poverty reduction and the MDGs. This provides a compelling basis for countries of the region to integrate sustainable consumption and production into their

development policies, strategies, and programmes. In addition to SCP, policies and programmes need to integrate Resource Efficiency (RE) principles and practices.

Resource Efficiency recognizes the need to consume fewer resources and produce less waste, while delivering the same or even more or improved end services or products (UNEP 2009). Box 1 shows the essential links between SCP and RE on the one hand, and poverty reduction and economic growth on the other. It demonstrates that SCP and RE are integral to the set of key tools that African countries should embrace in order to realize their economic growth and poverty reduction goals. SCP and RE also present opportunities for African countries to leapfrog to more resource-efficient, environmentally sound and competitive technologies and infrastructure, and for the creation of new markets and generation of jobs. Promoting and implementing holistic and integrated policies and actions towards SCP and RE, will help to address the interlinked crises of climate change, energy, food and water, currently confronting the world, and hitting the region hardest. In this context, SCP and RE can also contribute to building green economies.

Box 1.1: Linkages between SCP and RE and sustained growth and poverty reduction

Resilience to environmental risks. Poor people are more vulnerable to natural disasters such as floods, droughts, the effects of climate change and other environmental shocks that threaten their livelihoods and undermine food security. SCP measures can result in improved management of land, watersheds and forests, thus increasing resilience and limiting the exposure of poor people to environmental risks. SCP also reduces direct exposure to harmful pollutants (e.g. those in air, water, food and solid waste).

Health. Environmental conditions account for a significant portion of the health risks to poor people. Millions of deaths could be prevented annually through a healthier environment. SCP and RE can contribute to health through, for example, improved access to clean water and food, and improved waste management.

Livelihoods. Ecosystems provide services including food, fibre, fuel, freshwater and clean air on which poor people rely disproportionately for their wellbeing and basic needs. The environment also provides an income stream in sectors such as agriculture, fishing, forestry and tourism, both through formal and informal markets. SCP measures allow for more efficient use of these resources, and so effectively expand the resource base to meet human needs. Furthermore, SCP and RE can link very effectively to pro-poor development, particularly in instances where labour intensity (and associated employment) replaces a high dependency on inputs or energy-intensive mechanized processes. Environmentally sustainable initiatives can also often be part of a wider shift towards socially and economically responsible production and consumption, which can further strengthen poverty alleviation benefits.

Economic development and the move towards a green economy. Environmental quality contributes both directly and indirectly to a country's economic development and employment. And this is especially true in developing countries, including those in Africa. The agriculture, energy, forestry, fisheries, tourism and other sectors, contribute to economic development through mechanisms such as provision of food for consumption and sale or trade, provision of resources for manufacture of goods for local sale and export, and attraction of local and foreign tourists. SCP measures contribute to preserving and enhancing these ecosystem services, thus supporting economic development. In addition, many SCP measures that have environmental protection as their primary focus have additional economic development benefits. For example, the use of organic farming not only benefits the environment in terms of lower pesticide and fertilizer use, but contributes to the elimination of expensive fertilizer inputs. Furthermore, increasing manual labour based inputs can enhance profitability and create employment.

Source: Adapted from UNEP 2009.

In relation to sustainable consumption patterns, it is important to recognize that 41 per cent of the African population lives below the poverty line (UNDESA 2008b). In this regard, promoting sustainable consumption in the context of the region, should be pursued with a view to meeting the real need of achieving a better quality

of life, without undermining the natural resource base and destroying the ecosystems on which humanity depends. This cannot be more relevant as in the case of Africa.

Sustainable production on the other hand, should be adopted with the aim of improving products and/or production processes in order to reduce consumption of resources, use of hazardous materials, and production of waste and pollutants in the provision of products. These improvements should be made with due regard to the full life cycle of products or processes, without confining analysis to narrow geographical or supply chain boundaries. Examples of sustainable production include seeking alternative raw materials for production processes, recycling waste and wastewater streams, and reducing energy use per unit of product.

Therefore, if applied systematically, SCP tools can enable African countries meet the basic needs of their people, reduce poverty and pursue sustainable growth paths. This report is produced with this in mind. It advocates for the integration of SCP concepts and principles into development policies and practices in Africa.

1.2 Purpose and scope of this report

This third issue of the Sustainable Development Report on Africa (SDRA) is produced under the theme *Sustainable consumption and production (SCP) for sustainable growth and poverty reduction in Africa*. The SCP principles that underlie the sustainable development goals and commitments on the thematic cluster of issues addressed in the report influenced the choice of the theme.

The report is a joint publication of ECA, the United Nations Environment Programme (UNEP), the United Nations Industrial Development Programme (UNIDO) and the African Roundtable on Sustainable Consumption and Production (ARSCP). It documents progress made by African countries in the implementation of sustainable development commitments on the thematic cluster of issues comprising transport, chemicals, waste management, mining and sustainable consumption and production (SCP), including a Ten-Year Framework of Programmes on SCP.

The cluster of issues addressed in the report will be considered during the 18th and 19th Sessions of the UN Commission on Sustainable Development (CSD), (CSD-18 and 19) in 2010 and 2011, respectively. Implementation progress was assessed taking into account the main commitments and goals contained in Agenda 21 (A21), the Programme for the Further Implementation of Agenda 21 (PFIA21), and JPOI. Annex 1 contains a summary of these commitments. The report also highlights implementation challenges and constraints confronting African countries, and identifies policy measures and actions needed to accelerate implementation. The assessment provided in the report is in keeping with the overall goal of SDRA production, which is to serve as an important medium for monitoring and assessing sustainable development in Africa.

The report is targeted at African member States, regional and subregional organizations, and all partners and organizations. The intent is to advance the actions necessary to accelerate progress towards achieving sustainable development in Africa. The report is also intended to serve as a reference document for CSD-18 deliberations.

1.3 Methodology

This report is a result of a productive collaboration between ECA, UNEP, UNIDO and ARSCP. This augurs well with the UN General Assembly Resolution 58/218 of 23 December 2003, as reaffirmed by Resolution

59/227 of 22 December 2004 that mandates the UN Regional Commissions in collaboration with the CSD Secretariat, regional institutions and other UN organizations to organize multi-stakeholder RIMs to provide regional input to the work of the CSD in accordance with its multi-year programme of work.

Against this backdrop, ECA invited sister UN agencies and regional organizations to collaborate in the production of regional review reports on the cluster of issues to be considered at CSD -18 and 19, and in the organization of the Africa RIM. The reports served as background documents for the RIM. The collaborating agencies led the preparation of the thematic review reports on the basis of their respective comparative advantages. The transport and mining review reports were led by ECA, the reports on waste and chemicals management by UNIDO, while UNEP in partnership with ARSCP led the production of the report on sustainable consumption and production including the Ten-Year Framework of Programmes on SCP.

The draft reports were reviewed at an Ad hoc Expert Group Meeting (EGM), jointly organized by the collaborating agencies in June 2009. The reports were enriched on the basis of comments and inputs provided by the meeting. The final draft reports were presented to the Africa RIM, which was held under the auspices of the Sixth Session of the Committee on Food Security and Sustainable Development (CFSSD-6), 27-30 October 2009. The reports were finalized taking into account the comments and inputs provided by the RIM.

Following the Africa RIM, lead agencies, drawing from the final thematic reports, provided concise write-ups on the thematic issues to constitute the different chapters of the SDRA. The draft SDRA was circulated for internal and external peer review and was finalized on the basis of comments and additional inputs provided.

1.4 Organization of the report

This report comprises seven chapters. This introductory chapter provides the background and discusses the concept of sustainable consumption and production including its links and contribution to Africa's priority goals of achieving sustained growth and poverty reduction. The chapter also outlines the purpose and scope of the report and its production methodology.

Chapters two to six cover, consecutively: SCP, including the ten-year framework of programmes; waste management; chemicals management; mining; and transport. Each chapter is divided into the following sections:

- Introduction
- Major trends and emerging issues
- Implementation progress and achievements, including good practices
- Implementation challenges and constraints
- Lessons learned and recommended priority policy measures and actions to accelerate implementation and
- Conclusion.

Chapter seven identifies and discusses the inter-linkages between the different thematic issues, namely: SCP, waste management, chemicals, mining and transport, as well as crosscutting issues. It highlights progress made in addressing the inter-linkages and crossing cutting issues, as well as implementation challenges and constraints. It concludes by providing recommendations on policy measures and actions to harness the inter-linkages and address the cross-cutting issues.

Sustainable consumption and production



2.1 Introduction

Governments at the Johannesburg Summit in 2002 called for the development of a ten-year framework of programmes (10-YFP) in support of regional and national initiatives to accelerate the shift towards sustainable consumption and production (SCP) patterns (JPOI 2002). In addition to enabling African countries to achieve sustained economic growth and poverty reduction, SCP is also central to the attainment of MDGs. Table 2.1 highlights the important contribution of SCP to meeting the MDGs and thus the crucial need to adopt SCP related policies and strategies as part of the national development programmes and strategies including poverty reduction strategies (PRSs).

Table 2.1: Contribution of SCP to meeting the MDGs

MDG	Contribution of SCP and RE
Goal 1: Eradicate extreme poverty and hunger	<ul style="list-style-type: none">• Greater efficiency in resource use over the life cycle of goods and services results in improved productivity and reduced costs;• Growth in consumer demand for sustainable products can provide sustainable producers in developing countries with access to new markets, an opportunity for job creation and price premiums for their products, all of which can facilitate the transition towards a green economy;• Provision of cleaner and more resource-efficient services in areas such as water , energy and food allows more people to meet their basic needs; and• Better management of resources and agricultural land through more sustainable farming practices will result in improved land productivity and thus greater availability of food.
Goal 2: Achieve universal primary education	<ul style="list-style-type: none">• Collecting water and fuel wood places a burden on women and children (especially girls), reducing the time spent on education or income-generating activities. Providing resource-efficient energy and water services will help to reduce this burden; and
Goal 3: Provide gender equality and empower women	<ul style="list-style-type: none">• Introducing resource efficiency issues in the school curriculum can influence the behaviour of young people and their parents.

MDG	Contribution of SCP and RE
Goal 4: Reduce child mortality	<ul style="list-style-type: none"> Water-related diseases and acute respiratory infections are two of the leading causes on under-five child mortality. Providing cleaner and more resource-efficient energy and water services will help to reduce the prevalence of these diseases; Providing cleaner and more resource-efficient energy and water services will help to reduce the risks to pregnant women's health; Malaria, a major cause of under-five mortality, may be exacerbated as a result of deforestation, loss of biodiversity and poor water management. Improved resource efficiency would help to reduce these pressures; Improved health will be achieved through access to clean water (which will result from water supply infrastructure programmes and protection of water resources), clean energy (from decentralized renewable energy programmes) and improved nutrition (from sustainable agriculture projects).
Goal 5: Improve maternal health	
Goal 6: Combat HIV/AIDS, malaria and other diseases	
Goal 7: Ensure environmental sustainability	<ul style="list-style-type: none"> Improved SCP patterns helps to achieve the objective of decoupling economic growth from environmental degradation, thereby slowing biodiversity loss; Improved water treatment infrastructure, pollution prevention programmes, education on water resource protection, and programmes focusing on management of industrial wastewaters will increase the resource availability for drinking and improving sanitation; Promoting the efficient use of water resources helps to reduce the stress on water resources and improve access to water supplies; and Sustainable buildings, integrated waste management and sustainable transport can help to improve the lives of people living in slums.
Goal 8: Global partnership for development	<ul style="list-style-type: none"> Technology transfer through development assistance can allow developing countries to 'leapfrog' to SCP patterns; and International coordination and cooperation efforts to promote SCP help to promote international partnerships, efforts and initiatives to stimulate resource efficiency.

Adapted from: UNDP-UNEP (2009); and UNEP (2009)

2.2 Major trends and emerging issues relevant to SCP, economic growth and poverty reduction

The African region encompasses a vast area of widely differing economic, demographic and social situations and development trends. Africa covers 20.4 per cent of the global land area, contains about 13 per cent of the world's population, but generates only 1.7 per cent of the global gross domestic product (GDP) (UN-DESA 2008a). Differences among the countries are considerable. Population ranges from 0.2 million in Sao Tome and Principe to 148 million in Nigeria, while GDP per capita ranges from \$282 in the Democratic Republic of the Congo to \$28,923 in Equatorial Guinea. The greatest difference among countries is in their size, ranging from 460 km² in Seychelles to 2,376,000 km² in the Sudan. The region is thus large and diverse and the recommended approach for promoting SCP will vary from country to country.

Table 2.2: Area, population and GDP

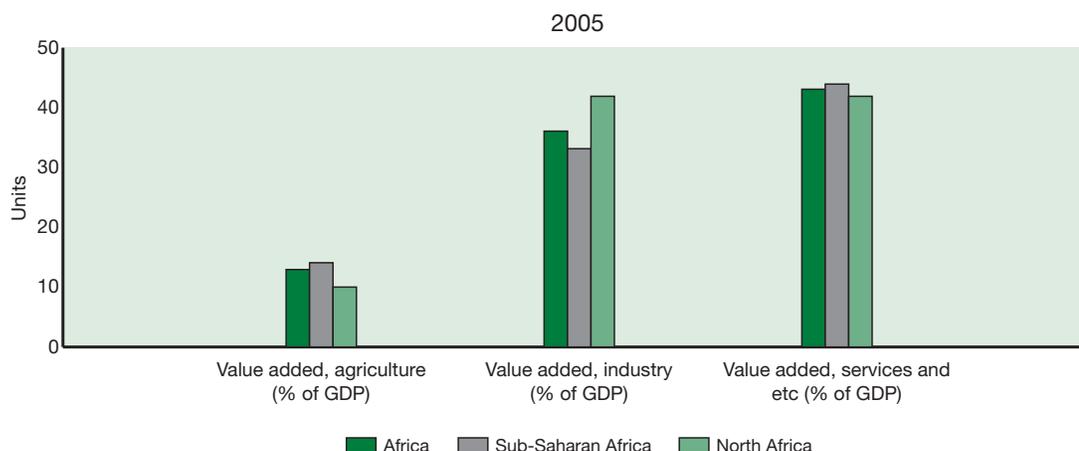
	Population (millions)	Land Area (thousands of sq Km)	Population density (people per sq Km)	GDP per capita, PPP(Dollars) Constant 2000 prices	per cent share of rural population to total population
Sub-Saharan Africa(SSA)	801	23,629	33.9	601.6	64.1
North Africa	157	5738	27.3	2136	47.1
All Africa	958	29,367	32.6	852	61.2

Source: ADI (2007).

The following major trends and emerging issues in the region related to SCP can be identified:

Compared with previous years, African economies have performed well in the new millennium. Per capita GDP grew by almost 2 per cent per year from 2000 to 2005, whereas it had actually declined slightly during the 1990s. Africa's recent growth performance has been underpinned by improvement in macroeconomic management in many countries and strong global demand for key African export commodities, sustaining high export prices, especially for crude oil, metals and minerals. As shown in figure 2.1, value added as a percentage of GDP in 2005 was 14 per cent, 29 per cent and 57 per cent for agriculture, industry and services, respectively (ADI 2007).

Figure 2.1: Growth across economic sectors



Source: ADI, 2007.

Structural change in African economies has been limited. African economies remain insufficiently diversified. Agriculture remains an important sector in much of sub-Saharan Africa. It provides 57 per cent of all employment, though only about 17 per cent of the GDP (UNDESA 2008a). The agro-industrial sector is still at such a low level of development that it is unable to act as a driver for the agricultural sector. Despite the importance of industry in the context of sustainable development and poverty reduction, the continent lags behind other developing regions in industrial performance. Structural changes in national economies have also been significantly influenced by growth in international trade, particularly exports of fossil fuels and metals and, increasingly, the import of manufactured goods from other parts of the world. Most countries in the region remain essentially primary commodity exporters, with only a handful of countries drawing a significant portion of their export revenues from manufactured products. Asia is rising as Africa's trade partner.

At the midway point between the adoption of the Millennium Development Goals in 2000 and the 2015 target date for their achievement, sub-Saharan Africa is not on track to achieve any of the goals (ECA 2005a). More than 41 per cent of the people in sub-Saharan Africa (or roughly 300 million people) still live on less than \$1 a day (UNDESA 2008a). Many Africans remain trapped in dire poverty, heavily dependent on a fragile natural resource base and vulnerable to economic and environmental shocks. Of the 162 million “ultra poor” people in the world who subsist on less than \$0.50 a day, 121 million live in sub-Saharan Africa. With a Gini coefficient of 51 per cent, Africa has the worst income distribution in the world. African populations are heavily burdened by poverty-related diseases. While much of the world is on track to meet the MDGs on water and sanitation, most of Africa is not. In 27 African countries, more than 30 per cent of the population does not have access to safe water. In nine of those countries, more than 50 per cent of the people lack access to safe water. There are 36 African countries where more than 50 per cent of the population lacks access to sanitation.

Population growth rate is still high as shown in table 2.3 below. High fertility rates will translate into rapid population growth well into the present century. From 520 million in 1990, the population is expected to reach 1.3 billion by 2030. Compared to that of other developing subregions, sub-Saharan Africa’s population is very young. Currently half of the population is less than 18 years old. This young population structure represents a particular challenge for African countries with regard to education and employment. Available statistics indicate a current rate of urbanization in Africa of around 3.5 per cent per year. This rate is the highest in the world, and is resulting in the rapid growth of urban agglomerations throughout the region. By 2030, the proportion of Africa’s urbanized population is expected to reach 53.5 per cent, compared to 39 per cent in 2005 (UNDESA 2008b). The level of urbanization has a strong impact on the patterns of consumption. In large cities, there is evidence of a growing middle class and its adoption of western consumption patterns such as private car ownership, increased meat consumption, and emergence of low-density detached housing developments in sub-urban areas.

Table 2.3: Socio-demographic trends in Africa (1997-2007)

	Population Growth, Annual per cent		per cent population under 14		per cent population over 65		Urban population, per cent	
	1997	2007	1997	2007	1997	2007	1997	2007
Sub-Saharan Africa	2.7	2.4	44.7	43.1	2.9	3.1	31.4	35.9
North Africa	1.7	1.6	36.8	30.4	4.3	4.9	50.5	52.9
Africa	2.5	2.2	43.3	41.0	3.2	3.4	34.8	38.7

Source: UNDESA, 2008b.

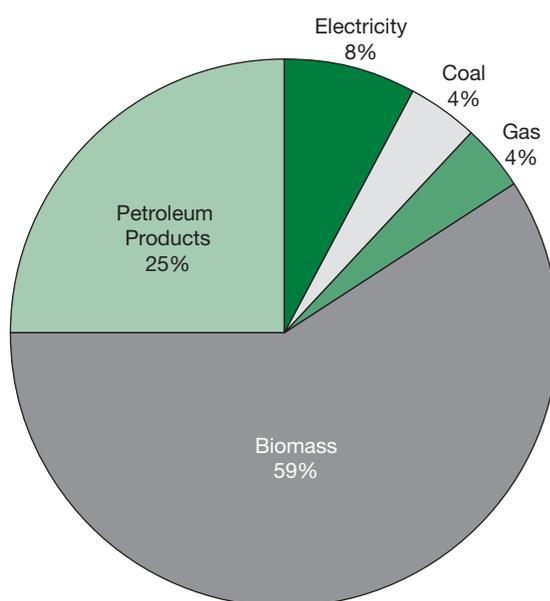
In the whole of Africa, household final consumption expenditure represented 68 per cent of GDP in 2007, compared to 13 per cent for the general government final consumption expenditure (ADI 2007). Food still dominates household expenditures across the African region, ranging from 50 per cent to 75 per cent of the mean monthly expenditure. Household consumption patterns will vary according to socio-economic factors, with lower-income countries having greater proportions of household expenditures on food, while upper-income countries spend more on SCP, communication and recreation and health care. Economy-wide analysis of environmental pressures is yet to be carried out in Africa.

Agriculture is still largely oriented towards subsistence. Low soil fertility, scarce irrigation, poor rural infrastructure, insufficient finance and recurrent droughts are among the major challenges facing sub-Saharan African agriculture. As a result of economic and environmental constraints, fishing and livestock-raising have failed to keep up with the growing African population. Consequently, food insecurity remains a major concern, with 24 sub-Saharan African countries requiring external food assistance at the beginning of 2007 (UNDESA

2008a). It is unlikely that the MDG target of halving the proportion of people suffering from hunger by 2015 would be achieved. The current pattern of agricultural development in Africa is therefore unsustainable. A large share of the population remains undernourished, and the degradation of land and ecosystems worsens food insecurity. In cities lifestyle changes have increased the demand for processed and imported food and packaging leading to significant structural changes in the food production systems and processing industry. From an SCP perspective, these structural changes need to take into account consumer concerns about food safety and quality issues and environmental concerns.

Africa is relatively well endowed with energy resources and produces about 10 per cent of the world's energy supply. However, with 13 per cent of the world's total population, Africa consumes only 5.5 per cent of the world energy, and it generates only 3.1 per cent of the world's electricity (ECA 2008). The per capita energy consumption of 0.5 tonnes of oil equivalent, far lower than the world average of 1.2 tonnes of oil equivalent per capita makes the continent lag behind all others in energy use. Energy production tends to be costly, relying heavily on fossil fuels (about 80 per cent of electricity generation), despite significant untapped hydroelectric and other renewable energy potential. Energy consumption in Africa is still largely dominated by combustible renewable resources (mainly biomass, animal waste), which represents 59 per cent of the total as shown in figure 2.2. In some countries, biomass accounts for more than 80 per cent of the total energy use. Lack of access to modern energy results in air pollution, acute health problems and environmental problems linked to over-consumption or inadequate management of wood resources. Many countries have relatively high energy intensities, showing the potential for energy efficiency (figure 2.3).

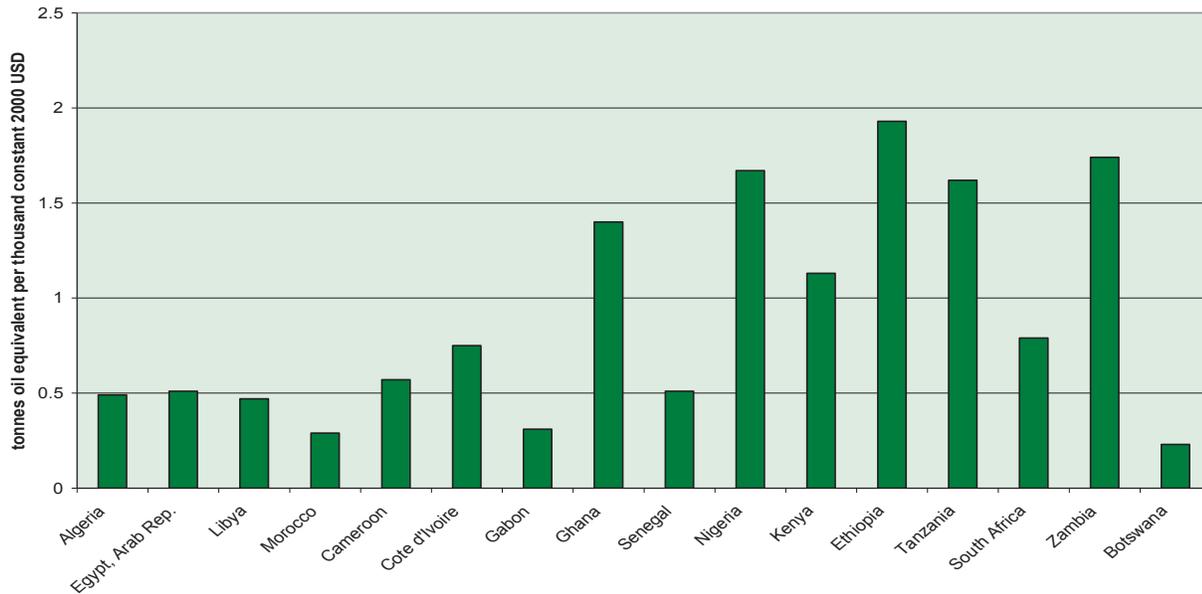
Figure 2.2: Energy Consumption in Africa in 2005 (in tonnes of oil equivalent)



Source: IEA, 2005.

Only about 7 per cent of Africa's enormous hydro potential has been harnessed and, based on the limited initiatives that have been undertaken to date, renewable energy technologies could contribute significantly to the development of the energy sector in Africa. The continent contributes only about 4 per cent of total greenhouse gases and most countries have very low carbon dioxide emissions per capita due to low energy intensities, low GDPs and high levels of biomass energy use.

Figure 2.3: Energy Intensities of some African Countries measured in tonnes of oil equivalent per unit GDP

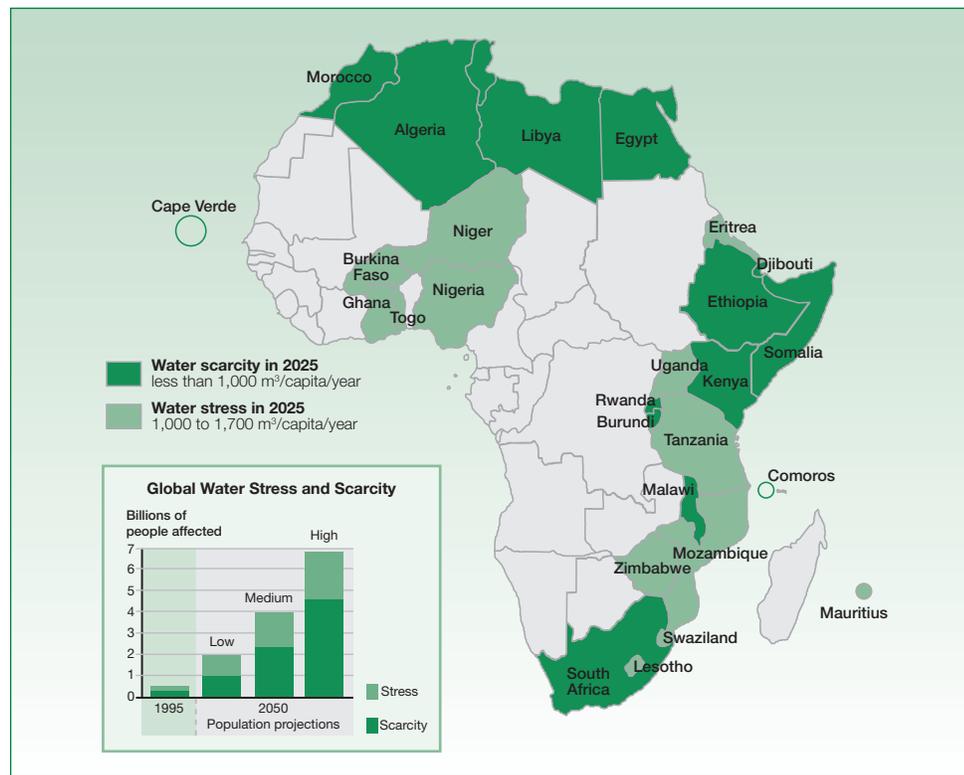


Source: ADI, 2007.

Africa is endowed with abundant water resources, which account for about 10 per cent of global freshwater endowments. Freshwater resources across Africa are, however, unevenly distributed. Although some African countries have high annual water averages per capita, many others already or soon will face water stress (1,700 m³ or less per person annually) or water scarcity (1,000 m³ or less per person annually). Currently, 14 countries in Africa, mostly located in the Sahel region and the Horn of Africa, are subject to water stress or water scarcity. A further 11 countries will join them in the next 25 years (UNEP 2006). As a result of climate change and variability, population growth, environmental degradation and resource mismanagement, access to freshwater is worsening in the region. Increased water scarcity in the future in many countries of the region implies a need for efficient management of shared water resources. In Africa, access to water supply and sanitation is very low. Only about 58 per cent of the sub-Saharan population has access to piped water supply and only 37 per cent has access to improved sanitation (ECA 2008).

Africa lags behind other regions in almost all its industry-related indices. The contribution of manufacturing output to total national income is generally low, with the share of manufacturing value added in GDP being at an average of only about 9 per cent (ECA 2005b). Positive performance in industrial growth in a few countries and an increase in foreign direct investment in African industry indicates potential for industrial take-off. The challenge is to ensure that environmental best practices are incorporated at the early stages of industrialization whenever manufacturing investments are being considered. It is to be noted that, while the overall level of industrial pollution is still low because of Africa's low level of industrialization, the environmental impact intensity in relation to the level of industrialization is among the highest in the world.

Figure 2.4: Freshwater stress and scarcity in Africa by 2025



Source: UNEP, 2006.

Africa is the fastest-urbanizing region in the world. The rural population is growing at a rate of 2.5 per cent per year, while the urban population is experiencing 5-10 per cent growth per year (ECA/UN-Habitat 2003). Africa's urban population was 373 million in 2007 and will reach 760 million in 2030. Increasing numbers of the poor will be city dwellers and sub-Saharan Africa has the third-largest number of slum dwellers, following South and East Asia. The urban population growth is not absorbed by the largest cities but by the intermediate cities (towns less than 500,000 inhabitants), where two thirds of all African urban growth is occurring. This swift urban growth means that Governments should strengthen the governance capacities of intermediate and smaller cities so as to be prepared for the rapid increase in new and additional demand for urban spatial planning, urban housing, urban services and urban livelihoods. The larger African cities will absorb the remaining one third of the continent-wide urban growth.

Urbanization presents both a challenge and an opportunity. It is a challenge in that providing additional millions of people with adequate housing, water and sanitation, transportation, waste management and other needs will require vast investment, skilled management and strong leadership. In addition, the concentration of people increases the risk of diseases, pollution and disaster. On the other hand, the concentration of people will also facilitate the provision of education, health care, transportation and other social services. Urbanization also tends to conserve energy and natural resources.

Transportation services contribute to development and their improvement will be essential for Africa to achieve sustainable development and the MDGs. The poor state of SCP infrastructure impedes Africa's development and obstructs poverty reduction. In many African countries, SCP access rates and network quality are low by any standard. Less than a third of Africa's 2 million km of roads are asphalted, with a low density of 6.84 km per 100 square km, compared to 12 km in Latin America and 18 km in Asia (UNDESA 2008a). Urbanization and increasing motorization in sub-Saharan Africa have resulted in a high level of degradation of the air

quality, particularly in the large cities. Provision of good Transportation services and infrastructure constitutes a necessary precondition for African economic growth. A SCP system that supports sustainable development is one in which SCP is used to minimize demands on non-renewable resources such as fossil fuels and metals. It also minimizes the adverse impacts on human health and the environment, such as pollution and contributions to climate change, or waste generation. Likewise, it provides for affordable mobility to gain access to services, jobs and education.

The problem of solid waste management is a growing source of concern in African urban centres driven by population growth, industrialization and rising living standards, and is identified as one of the major challenges in the promotion of sustainable consumption and production in the region. Industrial, electronic and medical waste, some of which is hazardous, is also increasing rapidly in many countries. African cities have not been able to set up adequate systems for the collection of municipal and industrial waste due to their poor infrastructure base, limited resources and lack of proper urban management. The solid waste generation of selected cities in Africa ranges from 0.3 to 1.9 kg per person per day (Achakeng 2003). The limited available data suggests that the municipal solid waste stream in the typical African city at point of disposal is high in biodegradable organic matter. However, it has a low percentage of commercially recyclable components and very low heating value for energy recovery by incineration.

There are few formal systems of materials recovery through the public and private sectors in Africa. Instead, in most parts of Africa, materials recovery including source separation and recycling takes place in the informal sector. With few official statistics on municipal solid waste generation and recycling, it is difficult to arrive at an overall rate of waste recycling in Africa. Obtaining these data is vital for the design of well-integrated industrial solid waste management systems. Most major cities in Africa have an organized municipal waste collection system. Collection coverage across the continent range from 20 per cent to 80 per cent, with a median range of 40 per cent to 50 per cent (Cal Recovery, Inc. and UNEP IETC 2005). Most disposal sites in Africa are simply open dumps, although some countries have moved towards improved landfill practice recently.

Even though the organic content of the municipal solid waste in the typical African city may exceed 70 per cent (wet basis), centralized composting, anaerobic digestion and gas recovery are not significant components of African municipal solid waste management practice. For the most part in Africa, services are not available for the separate handling of special waste such as household hazardous waste, construction and demolition waste, medical and infectious waste, tires, sewage sludge or chemical and pharmaceutical waste.

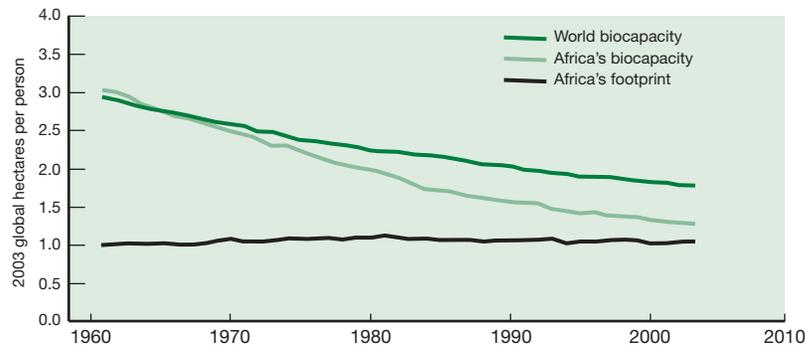
Africa has numerous tourist attractions ranging from wildlife to cultural heritage sites. Many African Governments have identified the potential of international tourism, which attracted about 37.3 million visitors or close to \$21.7 billion in revenue to African countries in 2005(www.unwto.org/facts). Roughly 60 per cent of international tourists who visit Africa are leisure tourists, 15 per cent are business tourists and 25 per cent come for other purposes. Eco-tourism is the fastest-growing tourism product in the world and Africa, for its natural endowments, constitutes an obvious destination with countries such as Uganda, Rwanda, Tanzania and Kenya. The ecological footprint of tourism activity is significant and the tourism industry and its associated infrastructure tend to be concentrated in biodiversity hotspots. On the other hand, tourism can foster environmental preservation, especially if it is eco-tourism. The tourism industry in Africa is characterized by a large number of small and medium-sized enterprises (SMEs) that in many cases lack the financial and human resources necessary to provide quality products and integrate sustainable tourism principles. On the other hand, mainstream international hotel chains are increasingly making efforts to reduce their environmental impacts.

The forest sector accounts for six per cent of GDP on the African continent, which is the highest rate in the world (UNDESA 2008a). Most rural households rely on wood fuel to cover their energy needs in sub-Saharan Africa. However, Africa is undergoing a severe process of deforestation. From 1990 to 2005, deforestation

took place at a rate of 0.7 per cent per year versus 0.2 per cent at the global level (UNDESA 2008a). Besides wildfires, agricultural expansion and high population growth rates are also exerting great pressures on forests. It is estimated that 60 percent of the tropical forest areas cleared in Africa as a whole between 1990 and 2000 were converted to permanent agricultural smallholdings.

The “Africa’s Ecological Footprint and Human Well-being” Report (Global Footprint Network 2008) shows that compared to the rest of the world, the average African’s footprint is small (1.1 global hectares).

Figure 2.5: Africa’s Footprint and Bio capacity and World Bio Capacity, per capita 1961-2003



Source: Global Foot Network 2008).

In 2003, Africa had 13 per cent of the world’s population but contributed only 6 per cent of the global footprint. But the report also reveals that a growing number of African countries are now depleting their natural resources faster than they can be replaced. Africa’s biocapacity is 1.3 global hectares per person, slightly more than what Africans use, but 28 per cent less than the world’s average of 1.8 global hectares available per person. While Africa still has more biocapacity than it uses, this margin is shrinking, largely due to population growth (figure 2.5). If current trends continue, Africa will soon be facing an ecological deficit, with demand exceeding the continent’s supply. Several African countries already have a footprint that is larger than their countries’ bio-capacity per capita meaning that a growing number of African countries are depleting their natural resources - or will shortly be doing so - faster than they can be replaced.

In short, the African region faces very different SCP challenges from those of developed countries. In much of Africa, there is a clear need to address the social pillar of sustainability as a large segment of the population lives in poverty and does not have access to basic needs, such as clean water, energy and adequate nutrition levels. The main challenge will be to satisfy the basic needs of the population. Natural resources are the basis for economic and social development in Africa. The poor tend to rely more on the natural resource base for their livelihoods than the rich. Unsustainable production patterns can produce significant social and environmental side effects that undermine the prospects for poverty reduction. Moreover, the unsustainable consumption patterns of the consumer class may further limit the “ecological space” available to poor people to meet their basic needs. Policies and actions supporting SCP can serve to bolster poverty reduction efforts, support sustainable long term growth and help to meet the MDGs. There are many opportunities to “leapfrog” towards more SCP patterns before consumption-driven impacts reach the levels observed in developed countries.

2.3 Implementation progress and achievements

The following is the progress made in the implementation of SCP-related goals and commitments in Africa.

Ten-Year Framework of Programmes

The African Ten-Year Framework Programme (10-YFP) on Sustainable Consumption and Production has been launched (UNEP 2005). It has a strategic focus of linking SCP with the challenges of meeting basic needs in more sustainable manners and has four thematic areas of focus, namely: energy, water and sanitation, habitat and sustainable urban development, and industrial development. A regional institutional focal mechanism – the African Round table on Sustainable Consumption and Production (ARSCP) and the Marrakech Taskforce on Cooperation with Africa supported by the Federal Ministry of Environment of Germany have been established. Sustainable consumption and production activities in the region have been strengthened through a number of pilot projects undertaken by the Marrakech Taskforce on Cooperation with Africa (ARSCP and UNEP 2006; UNEP 2006), such as the development of an eco-labelling scheme for Africa; the development of national and local SCP action plans in four countries; sustainable consumption and production of plastics; development of capacities for SCP in the Lake Victoria area; sustainable procurement and life-cycle assessment workshops; collection of best practices on SCP projects by development agencies; and a research study on leapfrogging possibilities for SCP in Africa.

Sustainable energy development

Progress has been made to provide means of implementation to among others promote clean and renewable energy, and to improve energy efficiency and access to advanced energy technologies, including cleaner fossil fuel technologies in Africa. The United Nations system and the international community have increased their efforts through various mechanisms at the international level (e.g. the special office for NEPAD) and at the regional level (e.g. the United Nations regional Coordination Mechanism) to support African countries in implementing NEPAD programmes. Financial investments in NEPAD energy projects have increased and are projected to grow further. The internal capacity of several development and commercial banks and private investors to assess investments in the energy sector has been improved. Several actions have been implemented to strengthen the capacity of energy planners and developers, education and research institutions and centres-of-excellence.

A multi-donor NEPAD infrastructure project preparation facility has been established at the African Development Bank. The facility has provided funding for the preparation of several regional projects, including oil and gas pipelines, hydroelectric power and power interconnection. Several United Nations agencies are supporting projects on energy access and efficiency and renewable energy. In recognition of the fact that the problem of access to energy in rural Africa requires much more attention, means and renewed commitments by all stakeholders, there is increased country-to-country and city-to-city dialogue and cooperation on the issue of clean energy access for the urban poor. Rural energy access scale-up initiatives led to the design of new energy supply schemes integrating energy services to the development of productive and income-generating activities, entrepreneurship, and the promotion of indigenous energy resources. Regarding changing patterns of energy consumption and production, in many countries, national capabilities on forestry services and energy agencies for wood energy planning and policy development have been enhanced. There are big hopes in many African countries for the development of bio-fuels and many projects have been launched. Estimates show that up to 16 sub-Saharan African countries can meet significant proportions of their current electricity consumption from bagasse-based cogeneration in the sugar industry (Karazeki 2003). Efforts to improve and modernize small-scale biomass energy constitute an important component of national energy strategies in many sub-Saharan African countries. The diffusion of solar water heaters has in general been slower than

anticipated and most solar water heaters in use are bought by high-income households, institutions and large commercial establishments such as hotels. Solar photovoltaics have been promoted in the subregion but they are still unaffordable to the majority of the population in sub-Saharan Africa, given the high levels of poverty.

Water and sanitation

The development of water infrastructure has been a priority of most African countries over recent decades. Many multilateral organizations have been involved in working towards the achievement of the MDGs on water and sanitation access. Some countries have achieved good progress in expanding access to services and improving operating performance. The African Ministerial Council on Water and the Africa Water Task Force has been established to enhance cooperation and coordination, in order to promote the development and implementation of coherent policies and strategies for water resources management. The water resources management component of the NEPAD short-term action plan has been developed. The African Development Bank is providing assistance to NEPAD to implement its water and sanitation infrastructure development programme with a view to enhancing regional integration. Under the auspices of UN-HABITAT, the “Water for African Cities” Programme is being implemented with the aim of reducing the urban water crisis in African cities. An increasing number of countries are undertaking policy, legal and institutional reforms and developing strategies for water resources development and management on the basis of integrated water resources management. Improving water efficiency and reducing water pollution from industry is one of the functions of NCPCs. Water and sanitation projects provide an ideal opportunity for promoting and applying SCP principles in Africa. More demand-side management approaches are needed. The development of innovative ways of providing water and sanitation services to the large segment of the population is another key challenge to meeting basic needs in the region. Although unregulated irrigation with wastewater does persist in some African countries, especially nearer smaller urban centres, the trend is towards regulated reuse of treated wastewater, as far as available capital resources allow.

Habitat and urban development

UN-HABITAT has launched the Global Campaign for Sustainable Urbanization to operationalize the Habitat Agenda at country level through various programmes such as “Water for African Cities”, “Urban Observatories”, “Safer Cities”, “Good Urban Governance” and “Local Agenda 21”. Furthermore, the UN-HABITAT Regional Office for Africa and the Arab States supported the global campaign launched in various countries. UN-HABITAT provided technical assistance in collaboration with Cities Alliance to implement the action plan on slum prevention and upgrading, and the cities development strategies. Furthermore, UN-HABITAT and other partners have also launched the Global Land Tool Network, which tries to document best land practices which could be of great benefit to Africa. In collaboration with the European Union, UN-HABITAT has implemented the Regional Urban Sector Profile for Sustainability in over 23 countries in Africa, to develop medium-to-long-term policies.

Many African countries have mainstreamed sustainable urbanization into their Poverty Reduction Strategy Papers (PRSPs), and have introduced programmes and projects for the provision of basic urban services such as water and sanitation, slum upgrading and prevention policies, as well as social housing schemes. With support from the Regional Office for Africa and the Arab States and UN-HABITAT programme managers, several countries in the region have undertaken initiatives to review and reform national housing and urban development, and policies and legislation for adequate access to land, water and sanitation, slum prevention and upgrading and shelter. However, sustainable buildings criteria and rating systems still need to be developed, and SCP concerns are still not as integrated as they should be into spatial planning policies.

The Clean Air Initiative in sub-Saharan African cities launched by the World Bank in 1998 aims to improve air quality through the reduction of air pollution originating particularly from motorized SCP. Cities across Africa need to push harder to access a growing range of global environment funds to help them finance sustainable public SCP systems. The problem of solid waste management is a growing source of concern in African urban centres driven by population growth, industrialization and rising living standards, and is identified as one of the major challenges in the promotion of sustainable consumption and production in the region. Industrial, electronic and medical wastes, some of which are hazardous, are also increasing rapidly in many countries. African cities have not been able to set up adequate systems for the collection of municipal and industrial waste due to their poor infrastructure base, limited resources and lack of proper urban management.

Sustainable industrial development and corporate social responsibility

In 2004, AU endorsed the Africa Productive Capacity Initiative as a sustainable industrial development strategy of NEPAD. The African Productive Capacity Facility has been established as a financial mechanism to support the APCI. UNIDO has assisted many countries in Africa in developing and implementing programmes aimed at improving the competitiveness of selected industries, and wherever possible, identifying new market opportunities. UNIDO and UNEP, supported by UNDP and other bilateral donors, are the agencies most actively involved in promoting cleaner production in Africa. Projects to strengthen metrology, standards and testing institutions are under way in many countries. Countries have also established agro-processing ventures and medium-sized and micro-enterprises, and are gradually accessing finance, technology transfer and capacity-building opportunities for enhancing their growth and competitiveness, with an increased focus on women.

NEPAD also sets the tone for corporate social responsibility (CSR) in Africa by highlighting the need to create conditions for private sector growth in order to generate social development benefits. The African Peer Review Mechanism is an important instrument that can effectively promote CSR. The African Institute of Corporate Citizenship is promoting the role of business in building sustainable communities. Given Africa's developmental context, the application of CSR on the continent would help address those issues affecting the daily lives of Africans, including health, education, agriculture, and food security. African business organizations and several stakeholders from civil society and academia are participating in global initiatives, including the Global Compact and the UNEP Financial Initiative. Several companies in Africa are members of the World Business Council for Sustainable Development.

Food production and consumption

The performance of agriculture in Africa has improved slightly, with annual agricultural growth averaging about 3.9 per cent in recent years. However, while growth did take place, it did not really lead to improved food security and reduced poverty. A large share of the population remains undernourished, and the degradation of land and ecosystems worsens food insecurity. Measures taken by African countries to boost the development of the agricultural and rural sector include the Maputo Summit Declaration which endorsed the Plan of Action of the Comprehensive Africa Agriculture Development Programme, and the commitment by African leaders to allocate at least 10 per cent of their national budget to agricultural development; the Sirte Declaration on Agriculture and Water which called for the development of strategic agricultural commodities; the Fertilizer Summit which adopted the resolution to increase fertilizer use in Africa; and the Abuja Food Security Summit that recommended the establishment of an African common market for basic food products. Food supply chain members share the responsibility of producing and supplying food in the most environmentally sustainable way.

Consumers, on the other hand, indirectly influence upstream environmental impacts through their purchasing decisions. Scientifically reliable and understandable environmental information can help consumers in cities to consider the wider sustainability implications of their purchasing decisions and behaviour. There is great potential for organic food production in African countries, but the development of certified organic farming in African countries lags behind significantly.

Sustainable tourism development

NEPAD has identified tourism as an important vehicle for addressing the current development challenges facing Africa. In 2004, its Tourism Action Plan was approved. A main objective of the Plan is to provide an engine for growth and integration, and to contribute to poverty eradication. Most African Governments have now included tourism in their national development strategies. Countries have also started adopting policies that unlock the opportunities for the poor within tourism. Additionally, countries have adopted the Global Code of Ethics for Tourism and are monitoring its implementation (UNWTO 2005).

Cleaner production and eco-efficiency

National Cleaner Production Centres (NCPCs) have been established in: Ethiopia, Egypt, Kenya, Morocco, Mozambique, South Africa, Tunisia, Uganda and Zimbabwe. Their work programmes focus on three key activities: awareness-raising and training, demonstrations and assessments, and technical support for cleaner production. Other activities would include policy advice on cleaner production, product-related work and consumer awareness initiatives. There is an increase in the demand of cleaner production in energy and water. UNIDO and the NCPCs have launched both the Green Industry Strategy and the Energy Efficiency Strategy. The Green Industry Strategy involves existing and new industries and is expected to advise and support Governments in establishing green industrial sectors.

Development of policies and plans in support of SCP in Africa

Governments across Africa have made efforts to establish a national regulatory framework; create an environmental administration; provide funding for strategic programmes; and ensure more effective enforcement. Many countries have now built up institutions responsible for environmental protection, established environmental laws and regulations, and streamlined environmental responsibilities. They have also developed basic laws and national strategies or plans for sustainable development or environmental protection. Strategies and policies specifically targeting SCP have not yet been developed in African countries. Development of national pilot SCP programmes has either been completed or is ongoing in Ethiopia, Tanzania, Egypt, Mozambique, Mauritius, Senegal and Ghana. There are, however, a number of laws and overarching policies in most countries that are aimed at sustainable development and sound environmental management, and which are relevant and consistent with cleaner production requirements. African countries have few economic instruments that provide financial incentives for SCP. The African Eco-labelling Initiative was launched in 2007 to enhance the access of African products in regional and international markets by improving their environmental profiles and establishing a mechanism that promotes their marketability. In so doing, it would contribute to the NEPAD objective of promoting African exports. There has been little progress yet in the implementation of sustainable public procurement in African countries, despite the large volume of public procurement. Pilot countries have been earmarked in the African region for the development of sustainable public procurement programmes.

Research and education for SCP

Some universities in Africa have started introducing environmental studies into their education and training programmes. UNEP has interacted with about 300 universities in 53 African countries to formulate the Mainstreaming Environment and Sustainability in African Education Programme with the main objective of building capacity to promote good governance and educational policy in the region. The UNEP/Wuppertal collaboration centre on SCP is currently undertaking a project to introduce the issues and concepts of sustainable lifestyles and sustainable entrepreneurship into African universities by combining informal educational activities with formal education.

African nations need to produce a larger pool of good-quality tertiary graduates and postgraduates, particularly in fields that are relevant to a country's chosen strategy for economic development. Enhancing national, regional and global capacities for carrying out scientific research and applying scientific and technological information to SCP is also needed.

Despite the achievements, the impact and penetration of SCP activities are still very limited in most countries. Few activities have been conducted as part of the implementation of the African 10-YFP. SCP is a relatively new concept in the region, with only a few examples of integrated SCP activities. However, many of these examples concern sustainable production much more than sustainable consumption. Sustainable production activities are focused on cleaner production, environmental management systems (particularly ISO 14000), and corporate management practices. More advanced sustainable production concepts and instruments, such as life cycle assessment, product service and product design systems are still in their infancy in the region. Sustainable production in Africa may be described as a "work in progress" that has a long way to go before becoming widely adopted and fully integrated as an everyday practice. Francophone African countries in West and Central Africa show virtually little institutional capacity in cleaner production due to the absence of NCPCs.

The regional capacity for promoting sustainable consumption is far less developed than for sustainable production. There are no strategic or policy frameworks for promoting sustainable consumption at the national level. Compared to sustainable production, sustainable consumption is a far less developed and less recognized concept, as the region is still dominated by people living in poverty. Another important explanation for the little attention paid by Governments to sustainable consumption is that consumption is often perceived as necessary for economic growth. More sustainable consumption is perceived by authorities as lowering economic growth, even though they are missing out on the benefits resulting from reduced costs to society and the achievement of sustainability. Also, since sustainable consumption is a relatively new concept, consumer activism, when it exists, is still focused on prices, quality and safety. Sustainable consumption still remains to be mainstreamed into the consumer movement. There is also a general lack of capacity on sustainable consumption tools.

2.4 Implementation challenges and constraints

Priority areas for SCP will differ from one country to another, but the following challenges and constraints seem to be commonplace in most countries:

Poor education and lack of awareness on the benefits of SCP among all stakeholders;

Government failures, such as weak recognition of SCP in most policies and absence of a dedicated national program for the promotion of SCP, lack of legislation and/or enforcement capacity, weak institutional capacity for monitoring and for the use of economic instruments, and lack of decentralization to local authorities;

Lack of human and technical capacity including lack of capacity for product development and formulation of bankable CP projects in industry, lack of capacity on SCP tools in government, widespread reliance on obsolete technologies; lack of information on emerging clean technologies, and lack of cleaner production promoting institutions in many countries especially in West and Central Africa;

Economic failures such as financial instability of NCPCs, under-pricing of natural resources, lack of appropriate financing mechanisms for SCP investments, lack of financial incentives, and widespread poverty;

Systemic failures including absence of monitoring, lack of systematic training of employees, lack of research and development in industry, shortage of reliable data on pollution and use of resources, and inadequate research on SCP; consumer traditions; and

Organizational failures such as poor institutional setting and absence of collaborative projects and exchange programmes in the region to facilitate knowledge-sharing.

2.5 Lessons learned and recommended priority policy measures and actions

Lessons learned

Political will and commitment is essential for the effective implementation of the African 10-YFP. The organizational support that has been provided by UNEP together with the political leadership and support provided by AMCEN and the financial support provided by the Marrakech Taskforce on Cooperation with Africa have been highly instrumental in the achievements registered so far and for the significant level of interest amongst development partners in working with the region. The leadership and guidance being provided by the African Union Commission, ECA and UNEP in the further development and implementation of the 10-YFP should be maintained, if not enhanced. In addition to regional cooperation, international cooperation is important in ensuring programme implementation and the leapfrogging towards SCP. In this regard, the region's cooperation with development partners such as the Government of Germany and the Marrakech Task Forces should be fostered.

The ARSCP must capitalize on and better use the opportunity provided by the political commitment shown by AMCEN, the Marrakech Task Force on Cooperation with Africa and the other Marrakech Task Forces to strengthen its strategies and programmes. The Marrakech Process has not only contributed to the development of the regional 10-YFP, but is also a substantive forum for dialogue and cooperation on SCP issues. The Marrakech Task Forces are important mechanisms that have built North-South cooperation and have created potential areas for inter-task force cooperation in Africa.

A basic condition for SCP is to increase general awareness and understanding of the concept among all people. The meaning of SCP as applied to the local context needs to be developed and explained through education and communication, and SCP has to be perceived as a relevant priority by all stakeholders. Long-term education programmes and short-term aggressive public awareness campaigns targeting businesses, civil societies, financing institutions, etc. need to be part of any SCP strategy.

Individual initiatives will not bring about holistic changes in SCP patterns unless there is a national integrated strategy to promote SCP using a range of policies. Governments should develop appropriate national policy frameworks to effectively support integration and development of sustainable consumption and production, and the coordination between different government departments. SCP should be integrated into poverty

reduction strategies, national strategies for sustainable development, or national environment action plans. Once integrated, a second step would be to develop concrete sectoral action plans or frameworks (e.g. on energy, water, agriculture, SCP) that aim to promote sustainable patterns of consumption and production, with concrete targets and indicators.

In light of the variety of situations in all the countries, it is necessary for Governments to develop, in partnership with a wide range of stakeholders, national SCP strategies or action plans reflecting a country's specific priorities, and with concrete actions for their implementation. Beside its direct contribution towards promoting resource efficiency at all levels of production and consumption, the development and implementation of an SCP programme could also be instrumental in promoting synergies amongst the key development sectors outside the Ministry of Environment. In this context, it is recommended that African ministries should designate a focal point unit for SCP to facilitate inter-sectoral cooperation in the context of SCP programme development and implementation.

The effective development and implementation of sustainable consumption and production in African countries could be significantly facilitated through the mainstreaming of SCP into the priorities and decision-making criteria of bilateral and multilateral development financing agencies. Hence, development partners need to mainstream SCP into their bilateral financing procedures.

Governments should include SCP indicators in national statistics. These indicators are an essential tool for policymaking and help to capture the concept of sustainable production and consumption in statistics. Development of SCP indicators should become a component of any country-level SCP programme development activity.

A mix of policies and instruments is desirable for SCP implementation, with financial and economic instruments, information tools, and voluntary measures along with regulations. Enforcement capacity of regulations and institutional capacity for economic instruments need to be strengthened in all African countries.

All African countries and local Governments require assistance in starting sustainable procurement, including guidance on specific products.

Visible implementation of SCP activities at an early stage is important to demonstrate the concept and to show that it can have a significant impact on the production-consumption system. Examples of such activities include government green procurement programmes, waste recycling schemes, SME support programmes for cleaner production, introduction of compact fluorescent lamps, incentives for solar water heaters and solar panels, plastic bags and packaging, etc.

Capacity-building and skills development are important in the promotion of SCP. Tools to support or promote sustainable consumption need to be strengthened and integrated with production activities. Systemic approaches such as life-cycle assessment and green procurement are either nonexistent or still at an infancy stage and need to be further developed.

There is need for broader adoption and implementation by industry of values consistent with corporate social and environmental responsibility, such as those embodied in the Global Compact. Companies investing in Africa need to root their corporate social responsibility practice in African realities.

Despite much effort and resources spent by NCPCs, only a small part of industry has nationally adopted sustainable production. It will be impossible to assist individually each company to realize the benefits of sustainable production. It therefore seems necessary to focus on the demand side, creating demand for SCP, rather than focusing on the supply side. Such demand is created when enforcement of legislation is practised, suitable economic incentives are established and efficiency improvements offered by SCP provide a competitive edge. NCPC areas of focus need to expand beyond industries into other economic sectors. The centres, which

are now more mature, still need external support in training and advice in order to provide more efficient and innovative services to their clients, especially in the area of technology transfer.

Economic, environmental and lifestyle evidence of the adoption of SCP are key issues to convince the local community to make an active contribution. Small-scale projects, which could easily be replicated elsewhere upon successful implementation, should be encouraged. In order to make further progress on sustainable lifestyles, there is a need for massive education and awareness campaigns utilizing television and other media to generate actions to trigger a change to sustainable lifestyles and the active involvement of NGOs. Development and implementation of region-relevant education and awareness programmes covering all levels of the society, including youth groups, constitute an important instrument for addressing the existing lack of awareness of the contribution of SCP and create the required capacity for promoting sustainable consumption and production in the region.

Recommended priority policy measures and actions

Priority approaches and actions needed to enhance implementation of programmes to effectively address SCP in the region can be grouped under the following four clusters:

Institutional and policy mechanisms: The required policy measures and action include: support to governments to develop and implement target-oriented national and local action plans on SCP; coordinate SCP implementation across sectors through the designation of a focal line ministry for SCP; enable national statistical institutes and other producers of statistical information to monitor economic, social and environmental pressures on consumption and production; promote and support the integration of SCP into the policies of major development organizations and agencies; promote the internalization of environmental costs and the use of economic instruments, including natural resources accounting, payments for ecosystem services, and operationalization of MEAs such as the Clean Development Mechanism; enhance corporate environmental and social responsibility and accountability; strengthen demand-side management programmes with a focus on energy and water; support the scientific and technical community through public and private sector funded research and development for SCP; promote life-cycle thinking among governments and businesses using the model of the UNEP/SETAC Life Cycle Initiative; and ensure the financial and institutional sustainability of NCPCs.

Supporting tools and instruments: Actions and measures are needed to promote sustainable manufacturing and value chains targeting SMEs; support sustainable public procurement by enhancing the ongoing work of the Marrakech Task Force, and support governments at all levels working to implement sustainable procurement policies and procedures; promote sustainable products by supporting the creation of databases and the provision of information on sustainable products (including both environmental and social criteria), and address ways to raise awareness among consumers. Countries could, for example, focus on organic food and energy- labelling schemes and implement the African Eco-labelling Mechanism; support local governments to better integrate environmental, social and economic costs into urban planning and to integrate sustainable cities and communities plans into local A 21 action plans. Cities should also develop integrated solid waste management action plans and support changes in key production-consumption chains using the expertise of the Marrakech Task Forces and the NCPCs.

Education on SCP: Actions need to be taken to develop and disseminate SCP modules for education curricula at all levels (schools, college, public service, on-the-job training); support Governments wanting to promote low-resource intensity societies and lifestyles; encourage and leverage forums on alternative ways of consuming (including NGOs, community groups, cooperatives, and consumer groups); create a resource repository and translation facility which can include best practices databases; create networks of excellence on SCP, particularly linking African universities and NCPCs with centres of excellence with each other and with counterparts in

developed countries; experiment with local sustainable communities, stimulating grassroots sustainable action, with the active involvement of NGOs; and conduct systematic SCP education and awareness campaigns, for example on energy and water use efficiency, using national television and other media to generate actions for a change to sustainable lifestyles.

Means of implementation: An effective institutional framework at national, regional and global levels is crucial for the promotion of SCP; mobilization of financial resources through the development of SCP action plans and using the whole array of funding opportunities for its implementation. Special funds can be created by ministries of finance to fund SCP projects using revenues from taxes, subsidies, development partners and carbon credits; technology transfer and capacity-building to develop a critical mass of professionals in any country for implementing SCP activities; information and outreach by raising the visibility of SCP to international agencies and regional ministerial conferences using information tools and SCP networks; and enhancing partnerships and collaboration with development agencies, Marrakech Task Forces, other SCP round tables and SCP research centres of excellence.

Overall and in the context of the implementation challenges and lessons learnt, the region has identified and prioritized a number of concrete actions and projects for urgent support from development partners. The priority projects are: capacity-building for the development and implementation national SCP action plans; implementation of an African Local SCP Initiative; implementation of a regional programme on RECP involving building the capacities of NCPCs and SCP institutions; strengthening the AEM; promoting an integrated waste management (IWM) system in Africa; implementation of programmes on education for sustainable consumption and production in Africa; promoting sustainable building and construction in Africa; promotion of small-scale renewable energy and biomass-based co-generation; and regional knowledge management and information exchange on SCP in Africa.

2.6 Conclusion

The ongoing economic and social restructuring in Africa offers a unique opportunity to establish more resource efficient SCP patterns. There are many opportunities to “leapfrog” towards more SCP patterns before consumption-driven impacts reach the levels observed in developed countries. SCP strategies applied now will safeguard against unsustainable patterns of consumption and production in the future. Africa as a region is at the forefront of the global Marrakech process on the Ten-Year Framework of Programmes as it has a regional 10-YFP that is supported by the Marrakech Taskforce on Cooperation with Africa as the only region-focused taskforce under the global support mechanism. The region has therefore established appropriate structures, political goodwill and mechanisms for sharing information and these now need to be fostered by governments, regional organizations and development partners. The Marrakech Process has not only contributed to the development of the regional 10-YFP, but is also a substantive dialogue and forum for cooperation on SCP issues among governments and other stakeholders at the regional level.

However, even with regional and international support, SCP is a concept that needs to be built from the national level. There is a need for enhanced political will and commitment at all levels. Change towards SCP is a systemic challenge. Businesses, consumers or policy makers usually cannot solve problems alone but must work together in a ‘triangle of change’. SCP is a broad agenda, touching almost all economic activities. It will inevitably overlap with the activities of many agencies that do focus on energy, mobility, water, waste etc but who do not label their activities as SCP. A strategy is needed to push forward the SCP agenda through regional and national integrated programmes. At the same time, lessons learnt from niche experiments and pilot studies and their sharing and replication throughout the region will help in mainstreaming SCP in national policies and strategies and in achieving the aim of SCP patterns and “Green Economies” in Africa.

References

Achankeng, E. (2003). Globalization, Urbanization and Municipal Solid Waste Management in Africa. African Studies Association of Australasia and the Pacific 2003 Conference Proceedings - African on a Global Stage.

ADI (2007). Africa Development Indicators. The World Bank. Washington DC.

ARSCP and UNEP (2006). Sustainable Consumption and Production Activities in Africa: Second Regional Status Report (2004-2006). United Nations Environment Programme.

Cal Recovery, Inc and UNEP IETC (2005). Solid Waste Management-Volume II-Regional Overviews. United Nations Environment Programme. International Environment Technology Centre. Tokyo.

ECA (2005a). The Millennium Development Goals in Africa: Progress and Challenges. Economic Commission for Africa. Addis Ababa.

ECA (2005b). Africa Review Report on Industry for Sustainable Development. Economic Commission for Africa. Addis Ababa.

ECA (2008). Sustainable Development Report on Africa. Economic Commission for Africa Addis Ababa.

ECA/UN-Habitat (2003). African Regional Implementation Review for the Commission on Sustainable Development (CSD-12): Report on Human Settlements.

Global Footprint Network (2008). Africa. Ecological Footprint and Human Well-being. Global Footprint Network. USA.

IEA (2005). International Energy Agency. World Energy Outlook 2005. Paris.

JPOI (2002). Report of the World Summit on Sustainable Development, Johannesburg, South Africa, 26 August-4 September 2002, Chap. I, resolution 2, annex.

Karakezi, S. (2003). Renewable Energy in Africa: Prospects and Limits. Workshop for African Energy Experts on Operationalizing the NEPAD Energy Initiative. Dakar. 2-4 June 2003.

UN-Habitat (2008). State of the World's Cities 2008/2009: Harmonious cities. United Nations Human Settlements Programme.

UNDESA (2008a). United Nations Department of Economic and Social Affairs. Trends in Sustainable Development. Africa Report 2008-2009. United Nations. New York.

UNDESA (2008b). United Nations Department of Economic and Social Affairs. Report of the Secretary-General. Commission on Sustainable Development. Sixteenth Session. 5-16 May 2008. United Nations. New York.

UNDP-UNEP (2009). Mainstreaming Poverty-Environment Linkages into Development Planning: A Handbook for Practitioners.

UNEP (2005). The African Ten-Year Framework Programme on Sustainable Consumption and Production. United Nations Environment Programme.

UNEP (2006). United Nations Environment Programme. African Environment Outlook 2: Our Environment, Our Wealth. http://unep.org/dewa/africa/aeo2_launch/

UNEP (2009). Mainstreaming Sustainable Consumption and Production and Resource Efficiency into Development Planning.

UNWTO (2005). Report on the WTO Survey on the Implementation of the Global Code of Ethics for Tourism. World Tourism Organization.

Chemicals

3

3.1 Introduction

Chemicals are important determinants for sustainable development, sound environmental health and quality of life. The use of chemicals in all human activities such as agriculture (agrochemicals), infrastructure development (plastics, metals), and health (water purification, disease alleviating drugs) is generally contributing to improving the quality of life. At the same time, however, over their life cycle, including their production, use, transportation (and storage) and disposal, chemicals present both environmental and human health risks. This raises concerns due to potential for harm through exposure of workers, consumers, environment and society at large. Furthermore, accidental releases from the distribution, consumption and disposal of chemicals may permanently damage soil, water and air. The challenge for countries is to harness the benefits of chemicals' use while minimizing the health and environmental risks posed by their production, distribution and end-of-life disposal. This calls for environmentally sound management of chemicals for sustainable development of the country.

The overarching issues in chemicals management are relatively well known and international commitments have been made by African and other countries to address them, for example in Agenda 21 and further reinforced by resolutions made at the World Summit on Sustainable Development (WSSD) in its Johannesburg Plan of Implementation, and the Millennium Development Goals (MDGs). Annex contains a summary of the main chemicals-related goals and commitments contained in A21, PFIA21 and JPOI.

In most of the African countries agriculture dominates the economy, in terms of job creation, contribution to GDP and/or contribution to export earnings. In response to the need to boost agricultural productivity and to attain food sufficiency, there is a tendency towards the use of chemicals such as fertilizers, veterinary chemicals, and plant protection substances. Several pesticides have already been designated as Persistent Organic Pollutants (POP), whilst the production of others can cause the generation of unintentional POPs. Pesticide formulation plants exist in many countries in the region although generally at least the active and auxiliary ingredients are imported and not produced in Africa. Sub-Saharan Africa imports less than 5 per cent in terms of value of the total pesticides import of the world. Widely used pesticides organochlorines are DDT, Endosulfan, Chlordane, Lindane (HCH), Heptachlor, Toxaphene, HCB and Aldrin (UNEP, 2002).

The industrial sector within African countries, despite its small contribution to GDP, supplies important consumer goods both to the domestic and international markets. The main manufacturing products are textiles, foodstuffs, beverages, and non-metallic products. The industrial sector is progressively gaining ground in many African countries. It now represents 4 per cent to 32 per cent of the national GDP in most African countries. Having been dominated by food industries for a long time, the industrial sector has rapidly diversified due to

the rise of certain strategic chemical sectors such as petroleum, pesticide and pharmaceuticals, among others. Other sectors that contribute significantly to the GDP are the services sector and tourism (which includes the hotel industry). Mining is also an important activity in some countries. Box 1 summarizes the contribution of the Chemical sector to the GDP.

To meet its developmental needs, Africa imports increasing amounts of various types of chemicals for industrial, domestic and agricultural purposes, and for cosmetics, food, plastics, laboratory, petroleum, and a host of other uses. On the other hand, some countries have successfully diversified their economic activities by carving out special niches in textiles, financial services, and Information and Communication Technology (ICT).

Box 3.1: Contribution of Chemical Sector to Selected African Economies

Morocco:

- 34 per cent of the total industrial production
- 35 per cent of the industrial GDP
- 30 per cent of the total industrial plants
- 19 per cent of the total workforce in processing industries
- 35 per cent of industrial investments
- 48 per cent of the production of the sector is exported

Nigeria:

- Crude oil accounts for 95.7 per cent of exports
- Agricultural products account for 2.6 per cent
- Manufacturing (including semi processed agricultural products) shares 0.5 per cent of exports

South Africa:

- Accounts for 5 per cent of gross domestic product (GDP) and about 22 per cent of its manufacturing sales
- The industry employs about 160,000 people

Tanzania:

- Industrial sector contributes about 9.2 per cent of the GDP (all use chemicals)
- Mining sector constitutes about 4 per cent of the GDP

Source: UNIDO, 2009e.

There are four main international conventions pertaining to the management of chemicals. These are the Basel Convention; the Montreal Protocol; the Rotterdam Convention; and the Stockholm Convention. A number of African countries have acceded to and ratified these four international conventions as shown in table 3.1. In addition to these four, there are also the Bamako Convention, an African own initiative, and SAICM (Strategic Approach to International Chemicals Management); a policy framework to foster sound management of chemicals.

Table 3.1: Number of African countries party to each convention

Convention	Number of Participating African Countries	Reference
Basel Convention	46	UNIDO, 2009(e)
Rotterdam Convention	41	UNIDO, 2009(e)
Montreal Protocol	38	http://ozone.unep.org/Publications/
Stockholm Convention	50	UNIDO, 2009(e)
Bamako Convention	53	http://www.africa-union.org/
SAICM	Core group of 11 African and 2 NGO representatives	http://www.saicm.org/

The Basel Convention relates to the Transboundary Movements of Hazardous and Other Wastes and was entered into force on 5 May 1992. The Convention also developed the criteria for the environmentally sound and sustainable management of chemicals and a Control System, based on prior written notification, was also put into place. As of March 2009, there are a total of 172 parties and signatories to the convention. Out of these, 46 are African states.

During the period 2000 to 2010 the focus is to ensure the full implementation and enforcement of treatment commitments, as well as the minimisation of hazardous waste at source. Recognizing that the Convention needs to focus on more than just the end stage of the life cycle stage of hazardous chemicals, plans for post 2010-period focus on the active promotion and use of cleaner technologies and production methods to prevent the generation of these wastes in the first place, as the long-term solution to the stockpiling of hazardous wastes. Other plans include further reduction of the movement of hazardous and other wastes and an emphasis on an improvement of institutional and technical capabilities - through technology when appropriate - especially for developing countries and countries with economies in transition.

Under Article 14 of the Basel Convention, provision was made for the establishment of Basel Convention Regional Centres (BCRC). The focus of these BCRC's is training and technology transfer for the management and minimisation of hazardous and other wastes. In Africa BCRCs are currently established in Cairo (Arab speaking), Ibadan (Nigeria) (coordinating centre), Dakar (Senegal) (French speaking) and Pretoria (South Africa) (English speaking). Activities of the BCRCs are discussed in Section 3.

The Rotterdam Convention came into force on 24 February 2004. The main objectives of the Convention are to promote shared responsibility in the international trade of certain hazardous chemicals, and to contribute to the environmentally sound use of those hazardous chemicals.

The Convention creates legally binding obligations for the implementation of the Prior Informed Consent (PIC) procedure. It built on the voluntary PIC procedure, initiated by UNEP and FAO in 1989 and ceased on 24 February 2006.

The Convention covers pesticides and industrial chemicals that have been banned or severely restricted for health or environmental reasons. There are currently 40 chemicals listed in Annex III and subject to the PIC procedure. These include 29 pesticides (including 4 severely hazardous pesticide formulations) and 11 industrial chemicals. More chemicals are expected to be added in the future.

The Convention also promotes the exchange of information on a very broad range of chemicals. It does so through a number of actions such as requiring Parties to inform one another of a national ban or severe restriction of a chemical; information to other Parties on the export of such chemicals; and providing an up-to-date chemical-specific safety data sheet to the importer.

The Stockholm Convention on Persistent Organic Pollutants (POP) is a global treaty to protect human health and the environment from chemicals that remain intact in the environment for long periods, become widely distributed geographically and accumulate in the fatty tissue of humans and wildlife. The treaty was adopted in 2001 and entered into force 2004 and requires Parties to take measures to eliminate or reduce the release of POPs into the environment. The Convention initially covered 12 chemicals, which came to be known as the “dirty dozen”. In May 2009, nine more chemicals were added to the list (see box 2). Over 50 African countries have already conducted inventories of POPs within their territories.

One of the chemicals under the convention is DDT which was widely used to control mosquitoes that transmit malaria. The treaty specifically permits the use of DDT for malaria vector control. This is very relevant for many African countries where malaria persists.

Box 3.2: POPs controlled by the Stockholm Convention

ANNEX	CHEMICALS
A: Elimination	<i>Pesticides:</i> Aldrin, chlordane, DDT, dieldrin, endrin, heptachlor, hexachlorobenzene (HCB), mirex and toxaphene. Added in 2009: Lindane, Alpha hexachlorocyclohexane, Beta hexachlorocyclohexane, chlordecone, and pentachlorobenzene <i>Industrial chemicals:</i> PolyChlorinated Biphenyls (PCBs) and HCB. Added in 2009: Hexa and hepta bromodiphenyl ether, Tetra and Pentabromodiphenyl ether, and Hexabromobiphenyl
B: Restriction	DDT which can only be used for disease vector control in accordance with World Health Organization recommendations (on interior walls only). Added in 2009: Perfluorooctane sulfonic acid, its salts and perfluorooctane sulfonyl fluoride. The current intentional use of PFOS is widespread and found in products such as in electric and electronic parts, fire fighting foam, photo imaging, hydraulic fluids and textiles.
C. Unintentional production	Unintentional byproducts, mainly dioxins and furanes. Added in 2009: pentachlorobenzene

Source: <http://chm.pops.int/>

One of the requirements of the Convention is that Parties prepare and implement a phase out plan of action for POPs. Developing country Parties can access funding from the Global Environment Facility (GEF) for preparation of such National Implementation Plan. This NIP outlines all aspects of management of the identification and elimination of POPs, including general awareness mechanisms and strategies to dispose of waste. The overall objective of the NIP is to create the national mechanism and instrument for protecting human health and the environment from the effects of POPs by preparing the ground for effective implementation of the Convention and strengthening of the country’s national capacity to manage chemicals in general, and POPs in particular.

The **Montreal Protocol** on Substances That Deplete the Ozone Layer is an international treaty designed to protect the ozone layer by phasing out the production of a number of substances believed to be responsible for ozone depletion. The treaty came into force on 1 January, 1989. Since then, it has undergone seven revisions. It is believed that if the international agreement is adhered to, the ozone layer would recover by 2050. Due to its widespread adoption and implementation it has been hailed as an example of exceptional international cooperation.

Assessment Panels were created under the Montreal Protocol to assist Parties to the protocol to reach informed decisions through the provision of independent, technical and scientific assessments and information. There

are currently three Panels; namely, the Panels for Scientific, Environmental, and Technology and Economic Assessments.

Box 3.3: Some Definitions

Sound Chemicals Management: identification, review and management of potentially adverse impacts on human health and environment associated with production, use and disposal of chemical substances, including pollution prevention, source reduction and pollution control.

Risk Assessment: The overall process of identifying all the risks to and from an activity and assessing the potential impact of each risk.

Risk Management is the identification, assessment, and prioritization of risks followed by coordinated and economical application of resources to minimize, monitor, and control the probability and/or impact of unfortunate events.

Life Cycle: the various stages in production and consumption of chemicals, or chemical-containing products, including: raw material extraction, chemicals production, manufacturing of chemical containing products, their distribution, use and end of life management.

Life Cycle Assessment: investigation and evaluation of the environmental impacts of a product (or chemical) caused or necessitated by its existence. It requires the assessment of production, manufacture, distribution, use and disposal including all intervening transportation steps necessary or caused by the chemicals product's existence. The sum of the environmental impact of all those steps - or phases - is the Life Cycle Assessment of the chemical.

The Technology and Economic Assessment Panel operates with six Technical Options Committees including chemicals, flexible and rigid foams, halons, medical, methyl bromide, and refrigeration, air conditioning and heat pumps.

In accordance with Article 6 of the Montreal Protocol and subsequent decisions of the Parties, the three Panels carry out periodic assessments on the scientific issues of ozone depletion; environmental effects of ozone depletion; status of alternative substances and technologies as well as their economic implications.

The **Bamako Convention** on the ban on Import into Africa and the Control of Transboundary Movement and Management of Hazardous Wastes within Africa, is a treaty of African nations prohibiting the import of any hazardous (including radioactive) waste. The Convention came into force in 1998. Impetus for the Bamako Convention arose from the failure of the Basel Convention to prohibit trade of hazardous waste to Least Developed Countries (LDCs), and from the realization that many developed nations were exporting toxic wastes to Africa.

The Bamako Convention uses a format and language similar to that of the Basel Convention, but is much stronger in that it prohibits all imports of hazardous waste. Additionally, it does not make exceptions on certain hazardous wastes (like those for radioactive materials) made by the Basel Convention.

The **Strategic Approach to International Chemicals Management** (SAICM) was adopted by the International Conference on Chemicals Management (ICCM) on 6 February 2006 in Dubai, United Arab Emirates as a policy framework to foster the sound management of chemicals around the world. Voluntary in nature, SAICM's overall objective is to achieve the Johannesburg Plan of Implementation that renews the commitment, as advanced in Agenda 21, to sound management of chemicals throughout their life cycle and of hazardous wastes for sustainable development as well as for the protection of human health and the environment.

This goal to be achieved by 2020 is that chemicals are used and produced in ways that lead to the minimization of significant adverse effects on human health and the environment using transparent science-based risk assessment and management procedures. SAICM supports developing countries to strengthen their capacity for the sound management of chemicals and hazardous wastes by providing technical and financial assistance. Specific SAICM objectives are grouped under five themes: risk reduction; knowledge and information; governance; capacity-building and technical cooperation; and illegal international trafficking.

3.2 Major trends and emerging issues

The overarching trends in chemicals use and management are its complexity and dynamic nature, which in turn pose continuous challenge for their environmentally sound management. Chemicals and chemicals-containing products are used in every aspect of human endeavour and new chemicals and chemicals-containing products enter a market that diversifies rapidly, in terms of active chemicals, actual and potential application areas, etc. The driving forces for these trends are discussed here.

Growing demand for chemicals: Chemicals' use is increasing in African countries and consequently import of chemicals and chemical containing products and their local manufacturing are expanding. Industrial chemicals use is on the rise, due to inter-alia, increased manufacturing and trade enabled by trade liberalization and creation of free trade zones. Chemical and petroleum industries currently account for 3 to 42 per cent of the GDP in African countries. In general however, apart from the major oil exporting countries (in particular Angola, Nigeria, Libya, Egypt and the Sudan, and emerging ones, Ghana and Uganda), the chemical industry still forms a relatively small share of GDP in most African countries.

Cheap labour and resources and weak environmental management capacities, are perceived by some as an economic opportunity for relocation of some industries or re-establishment of national industries with outdated equipment from industrialized countries (e.g. tanneries, lead acid battery recycling, etc.). Whilst the contribution to economic development and employment generation is welcome, relocated industries also pose a threat to environmental and human health, especially in situations where the primary reason behind their relocation is to avoid complying with stringent environmental regulations in the countries of origin.

The energy sector is also another area of concern with regard to safe handling of chemicals in Africa. Access to energy is still low in most parts of the continent, but this is expected to improve with economic growth. Power generation is still largely dependent on fossil fuels, and grids remain unreliable leading to common use of generally inefficient diesel generators. These are major sources of chemical discharges into the environment.

Africa with its growing population is in urgent need of increasing agricultural production (for food and in some cases biofuel, fibre or pharmaceutical) and industrialization. This trend will undoubtedly increase the use of chemicals, particularly fertilizers and pesticides in the agricultural sector.

Africa is prone to insect-borne diseases that impact negatively on human health (particularly malaria) and insect-borne plant pests. These threats are likely to increase with climate change which is already showing some impacts around the continent. Until alternatives like Integrated Pest Management and Integrated Vector Management are equally effective, use of chemicals would be expected to increase in order to control insects that transmit diseases to humans, plants and animals.

Access to safe drinking water and sanitation is still low in most parts of Africa. The construction and operation of additional drinking water and sewer systems and treatment plants will cause a rise in chemicals' use. A complicating factor is that uncontrolled discharge of chemicals and wastes pollutes water bodies and increases

both the health burden for communities relying on untreated water as well as the treatment needs for producing potable water. Resolving this is an urgent need for development of Africa.

There is a trend towards urbanization across Africa that is predicted to continue into the future. Urbanization is generally associated with increased consumption of industrially-manufactured goods. This scenario will therefore, lead to increased consumption of chemicals for household use, in building materials, urban transport and urban infrastructure (water and sanitation) across many expanding and upcoming urban centres in Africa.

Lack of chemicals management capacity: As demand for chemicals increases, greater varieties of chemicals enter into use. Whilst basic safety and environmental information are nowadays required for introduction of new chemicals, many African countries lack the knowledge and resources to undertake risk assessments and develop, implement and enforce necessary safeguards to address risks identified. This inability to assess and monitor the risks associated with trade in chemicals and chemicals contained in products, also fuels concerns such as the import into the continent of chemicals that would no longer be allowed in industrialized countries. Box 3.4 highlights some of the challenges faced by African countries.

Box 3.4: Example chemicals management challenges in Africa

- The production of agrochemicals is a key focus of the sector especially since agriculture still forms the backbone of many African economies. For example, in 2002, Africa contributed 5 per cent of pesticides to the total world production of the same.
- In 2002, Africa contributed only 3 per cent to the total world nitrogenous fertilizers production. The highest contributions from Africa were from Egypt and South Africa.
- Mining chemicals produced and used in large volumes in Africa include explosives and accessories such as fuses and detonators, and mineral processing agents such as leaching agents, floatation agents, smelting fluxes and refining chemicals.
- Some African countries have started to tap into their rich biological diversity to develop pharmaceutical chemicals, but the potential is not yet fully exploited.
- Chemical-related soil degradation in Africa affects 51 million ha of land, with about 40 million of these being nutrient deficient, and salinity affecting 6 million ha. Inappropriate fertilization and irrigation practices result in salinization and acidification.
- Despite the environmental threats posed by DDT, it has proved to be the most effective method of controlling malaria, and has therefore continued to be used for the same in Africa. This is also the main justification for its exclusion from chemicals banned under the Stockholm Convention, until such a time when equally effective environmentally friendly substitutes become available.
- Recycling can be an important environmental management strategy. However, where wastes contain toxic and other chemicals and/or heavy metals, recycling can lead to accumulation of these pollutants, creation of unintended POPs (dioxins and furanes) and increased human exposures through food and water.
- Inorganic chemical compounds and POPs present in water and food present risks to humans. In small quantities, fluoride is good for teeth. However, in excess quantities, it destroys teeth, accumulates in bones which results in crippling skeletal damage. This is especially a problem in children who are still growing. In 2004, cases of dental damage have been reported in Kenya, South Africa, the Niger, Ethiopia, the Sudan, Tanzania and Uganda.
- Toxic substances such as cadmium, lead, arsenic and sulphuric acid contaminate water and soil and affect human health. More than 50,000 tonnes of obsolete pesticides have been accumulated in Africa contaminating tens of thousands of tonnes of soil. These pesticides present a major threat to human health.
- In many mining centres, average atmospheric lead concentrations reach 0.3-0.5 µg/m³ and exceed 1000 µg/g in soils and dusts. The people of Kabwe in Zambia face a serious threat from zinc and lead mining activities. The vegetation, soil and water are contaminated and about 90,000 children are at risk of lead poisoning.

Source: UNIDO, 2009e.

The Specific challenges identified for selected African countries are as follows:

Tanzania: The major challenge for sound management of chemicals in Tanzania is the lack of specific policy in chemicals management to ensure that chemicals management is recognized as a national priority and is mainstreamed into national development plans and strategies. Other challenges include poor implementation of the existing laws and policies related to chemicals management due to limited resources; inadequate collaboration and coordination amongst the stakeholders; low awareness among the public on the adverse effects of chemicals; and overlap in the existing sectoral legislation which cause conflicting functions, interest and priorities (UNIDO, 2009c).

South Africa: The biggest threat to effective management of chemicals in South Africa is the lack of adequate information to all users of chemicals and the lack of effective enforcement. Due to the complexity of the legislation on chemicals management, compliance is often limited to the larger companies who participate in the Responsible Care Programme. The cost of compliance is relatively high and policing of the regulations is not adequate, leading to many Small, Medium and Micro Enterprises (SMMEs) evading effective regulatory control.

The development of coherent and integrated information on chemicals is also a challenge due to the complexity of the legislation on chemicals management and the different levels of communication required. There is lack of capacity among the SMMEs in the chemical industry to absorb the information and comply with the relevant environmental legislation. There is generally a very low level of interaction between SMMEs and the local Government. Most SMMEs have very low awareness of environmental costs. They use old technology and work under severe economic pressure. The focus is on cost and production with environmental performance generally given low priority.

In addition, prevention of illegal trade and trafficking of chemicals is a challenge in South Africa. It is difficult to do effective enforcement at all border posts due to limited capacity. There is no adequate tracking or audit system for chemicals. The inadequate capacity at Customs and Excise to detect illegal chemical trade further limits the effectiveness of current controls.

Despite the country adopting comprehensive legislation on sound management of chemicals, a significant number of workers, especially in SMMEs are currently exposed to hazardous chemicals and work in unsafe environment due to the lack of effective enforcement and low awareness among factory workers. The lack of appropriate testing facilities is also a limiting factor.

The use of Material Safety Data Sheets is quite comprehensive in the chemical industrial production sector. However, the further away from the original manufacturer as the chemical moves along the value chain, the weaker the hazard communication becomes. Awareness of possible risks posed by chemicals is still low among major segments of the South African population. Poor communities and communities living in peri-urban and rural areas lack adequate data and information on toxicity and safe use of chemicals. There are inadequate chemical emergence response centres in these areas and public awareness on the safe use and disposal of chemicals is low (UNIDO, 2009b).

Morocco: Despite acceding to and ratifying the main international conventions on chemicals such as the Basel Convention, the Stockholm Convention, and the Montreal Protocol on Ozone Depleting Substances, Morocco still makes use of internationally prohibited Chemicals. Without domestication of these international conventions and political will, mere accession cannot prevent issues such as illegal trafficking of chemicals in the continent and careless movements of hazardous and other wastes.

Box 3.5: What is REACH

REACH is a new European Community Regulation on chemicals and their safe use (EC 1907/2006). It deals with the **R**egistration, **E**valuation, **A**uthorisation and **R**estriction of **C**hemical substances. The new law entered into force on 1 June 2007.

The aim of REACH is to improve the protection of human health and the environment through the better and earlier identification of the intrinsic properties of chemical substances. At the same time, innovative capability and competitiveness of the EU chemicals industry would be enhanced. The benefits of the REACH system will come gradually, as more and more substances are phased into REACH.

The REACH Regulation gives greater responsibility to industry to manage the risks from chemicals and to provide safety information on the substances. Manufacturers and importers are required to gather information on the properties of their chemical substances, which will allow their safe handling, and to register the information in a central database run by the European Chemicals Agency (ECHA) in Helsinki.

One of the main reasons for developing and adopting the REACH Regulation was that a large number of substances have been manufactured and placed on the market in Europe for many years, sometimes in very high amounts, and yet there is insufficient information on the hazards that they pose to human health and the environment. There is a need to fill these information gaps to ensure that industry is able to assess hazards and risks of the substances, and to identify and implement the risk management measures to protect humans and the environment.

Source: <http://ec.europa.eu/environment/chemicals/reach>

Awareness of possible risks posed by chemicals is also low among major segments of the Moroccan population. This is further complicated by the general lack of reliable data and information on toxicity and safe use practices for chemicals. Access to such information in local languages is the key to improving environmentally sound management of chemicals (UNIDO, 2009a).

Nigeria: Lack of public awareness is also a key challenge in Nigeria. Despite the international and national instruments aimed at ensuring the environmentally sound management of toxic chemicals, awareness on the hazards and risk associated with them is low and this has resulted in abuse and misuse especially of the organochlorine pesticides. Intense trading in toxic chemicals in the informal sector by persons lacking scientific and safety knowledge is common and needs to be curtailed through the enforcement of appropriate national regulations.

About 90 per cent of chemicals in use in Nigeria are imported. The use, storage, transportation and the disposal of these, point to a growing problem that threatens the health of the people and the ecosystem. While some of the industries have in place environmentally friendly mechanisms for dealing with hazardous chemicals many others do not (UNIDO, 2009d).

Need for more international and regional cooperation: In order to capture opportunities for trade with industrialized countries, African countries will have to harmonize their trade and environmental policies. Overseas buyers increasingly demand evidence of environmental responsibility including sound management of chemicals, in part as a result of chemicals-based legislation coming into force through, for example, the European Union's REACH (Registration, Evaluation and Authorization of Chemicals) Regulations explained in box 3.5. A particular opportunity could exist for supplying environmentally sound goods and services (e.g. organic produce) to niche (inter) national markets.

Around the continent, there is a trend towards subregional and regional integration, for example, in ECOWAS (Economic Community of Western African States) and SADC (Southern African Development Community), which demands increasing harmonization of policies and strategies for environmentally sound management of chemicals. Moreover, institutions such as New Partnership for Africa's Development (NEPAD), the African Union (AU), the African Ministerial Conference on the Environment (AMCEN), the African Ministerial

Conference on Water (AMCOW) created for this integration purpose could potentially contribute to strengthening policies and strategies for implementation and enforcement of environmentally sound and sustainable management of chemicals.

3.3 Implementation progress and achievements

Many African countries have put in place sector policies and institutions for environmentally sound and sustainable management of chemicals, however this is often only as a subordinate mandate.

Examples of these environmental management acts and associated institutions include, among others the National Environmental Management Act No. 107 of 1998 of South Africa; the National Environmental Management Council of Tanzania; the promulgation of Decree 58 of 30 December 1988 establishing the Federal Environmental Protection Agency (FEPA) of Nigeria; the Environmental Management and Coordination Act (1999) of Kenya that created National Environmental Management Authority, the institution that manages environmental affairs in Kenya; the National Environmental Management Authority of Uganda, the Environmental Protection Agency of Ghana; and the Egyptian Environmental Affairs Agency.

Box 3.6: Progress at a glance

- Many African countries have put in place sector policies and institutions for environmentally sound management of chemicals.
- NCPCs have been established in eleven African countries to contribute, among others, to support the introduction of sound chemicals management practices and techniques in particular in the private sector.
- The African Stockpiles Programme (ASP) is active in supporting sound management of obsolete stocks of pesticides. ASP is supported by the Global Environment Facility (GEF).
- Africa has made progress in phasing out leaded petrol. This phase out has been facilitated by the Clean Air Initiative for Sub-Saharan Africa and UNEP's Partnership for Clean Fuels and Vehicles (PCFV).
- Some countries have been supported to introduce cleaner gold mining and extraction technologies to minimize or eliminate mercury releases, and to develop the regulatory capacity and mechanisms that will enable the sector to minimize the negative environmental and human health aspects of mercury use in gold mining.
- Most African countries have acceded to or ratified the four main international conventions on chemicals. MEAs that deal with specific categories of chemicals, and have dedicated financial instruments such as the Montreal Protocol and the Stockholm Convention, have advanced more rapidly in the implementation in many African countries. However, domestication of the conventions and/or development of National Implementation Plans (NIPs) for these conventions remain slow.
- SAICM, which has been endorsed by African Ministerial Council on Environment (AMCEN) is providing the policy framework and integrated approach to foster the sound management of chemicals in the region. The region has developed and adopted a regional plan of action, established a SAICM coordinating mechanism, i.e. the African Core Group with a view of facilitating regional work and two regional meetings have been held. Many countries have embarked on its implementation, including with funding provided by the SAICM Quick Start Programme (QSP).
- Basel Convention Regional Centres have been put in place and are providing capacity-building support and foster subregional and regional cooperation in best practices and policies for chemicals and chemical waste management.

Source: UNIDO, 2009e.

The approach to environmental management by many of the above and other African institutions is so far, sector-wise. In case of chemicals management, most countries have separate legislation and institutions for

pesticides, yet fewer for industrial, commercial and other chemicals. In some cases, the same chemicals are subject to different regimes, when used in different sectors. The coordinating mechanism for assessing and managing environment and health risks from import, manufacturing, distribution, use and management of waste (including empty containers etc.) of all chemicals regardless of their use sector, still needs to be developed and strengthened.

The national secretariats established for the various Multilateral Environmental Agreements (MEAs) on chemicals, e.g. the Basel Convention Secretariat, the Stockholm Convention Secretariat, have been a key driver for improved chemicals management. This has led to improved cooperation between countries and progress in the development of chemical profiles. Best practice has also been promoted by, amongst others, the formation of National Cleaner Production Centres (NCPCs) which now exist in 11 African countries.

Table 3.2 provides some examples of progress made in selected four African countries with regard to environmentally sound and sustainable management of chemicals.

Table 3.2: Some examples of environmentally sound management of chemicals

South Africa	<ul style="list-style-type: none"> • Pesticide Management Policy (2006) aiming to minimise the hazards and risks to health and the environment and to improve legislative framework to control the use and distribution of pesticides. • The development of a National Chemicals Profile to provide an understanding of chemicals produced, imported, exported, used, handled or disposed of in South Africa and environmental resources that are potentially affected by such chemicals. • The adoption of the Responsible Care programme - a voluntary programme, which requires chemicals companies to conduct their business in a manner that maintains health and safety standards and minimises their impact on the environment. • The plastics industry environmental initiative (Enviromark).
Morocco	<ul style="list-style-type: none"> • Initiating a National Profile on Chemicals' management in 2005 aimed at assessing national capacities of Chemicals' management, identifying existing weaknesses and available expertise and analysing the nature, the availability and the use of Chemicals within the country. • Adoption of the concept of Responsible Care by professional federations and associations.
Nigeria	<ul style="list-style-type: none"> • Intense public-awareness programmes for all stakeholders on the benefits of safe chemical usage and risk in improper handling of toxic chemicals. • Inventory of sources, types, environmental hazardous chemicals levels and infrastructure. • Regulations for environmentally sound management of chemicals, building up of efficient monitoring and enforcement of regulations for chemicals. • Development of a database for chemicals import and use. • Public-awareness programmes on the classification of chemicals, hazard signs, materials safety data sheet, personal protective equipment and safe disposal methods.
Tanzania	<ul style="list-style-type: none"> • Formulation and implementation of sectoral policies, legislations and regulations for sound management of chemicals throughout their life cycle. • Establishment of a register for pesticides and industrial chemicals. • Establishment of national profile for managing chemicals. • Establishment of preliminary inventory for obsolete pesticides. • Conducting awareness and capacity-building programmes for different stakeholders including decision makers, laws enforcers and chemicals and pesticides dealers on the safe handling of chemicals throughout their life-cycle. • Leading achievements in implementing SAICM (see box 10).

Multilateral Environmental Agreements

As already mentioned, the Basel Convention (Article 14) made provision for the establishment of Basel Convention Regional Centres (BCRC). Some illustrative activities undertaken by these BCRCs in Africa are presented in table 3.3 below.

Table 3.3: Illustrative activities of Basel Convention Regional Centres in Africa

Type	Project Theme	BCRC
Capacity Building	<ul style="list-style-type: none"> Assessing capacity to analyse POPs in developing countries Inventory and training on PCBs for SADC countries 	South Africa
Regional Cooperation	<ul style="list-style-type: none"> Coordinating implementation of chemicals and hazardous wastes conventions Compliance with MFAs 	Egypt South Africa
Promotion of Best Practices	<ul style="list-style-type: none"> Environmentally Sound Destruction of POP and Decontamination of POP Containing Wastes 	Egypt

Source: UNIDO, 2009e.

The Africa Institute for the Environmentally Sound Management of Hazardous and Other Wastes was recently created (2009) to foster activities of both the Basel and Bamako Conventions in Africa. It is co-located with the Basel Convention Regional Centre for English-Speaking African Countries in Pretoria, South Africa.

This institute is part of an Africa-wide network of regional centres, and aims to provide a service to 21 English-speaking African countries on the management of hazardous and other wastes. The objective of the Africa Institute is to strengthen the capacity of its Members in the area of environmentally sound management of hazardous and other wastes, including the minimization of their generation, in accordance with the provisions of the Basel and Bamako Conventions. The functions of the institute shall be to provide training, technology transfer information exchange, consulting, awareness raising, research, and guidance on management of hazardous wastes and other wastes for Members.

The Stockholm Convention (Article 12) also calls for the establishment of regional and subregional centres for capacity-building and transfer of technology to assist developing country Parties, and Parties with economies in transition, to fulfil their obligations under this Convention. The nominated centres in Africa are the National Centre for Cleaner Technologies Production in Algeria, and the Basel Convention Regional Centre for French African countries (BCRC-FA in Senegal).

Other activities undertaken in the framework of implementation of the Stockholm Convention include: the reduction in the total releases of POPs derived from anthropogenic sources by use of Best Available Techniques and Best Environmental Practices (BAT/BEP) for new sources; development of a harmonized framework for elaboration of comparable release inventories of Annex C chemicals, and for detailed state-of-the-art guidelines on best available techniques and guidance on best environmental practices; putting systems in place to evaluate whether the Stockholm Convention is an effective tool to protect human health and the environment from persistent organic pollutants; implementation of the Global Monitoring Plan with a harmonized organizational framework for the collection of comparable monitoring data or information on the presence of the Persistent Organic Pollutants from all regions, in order to identify changes in levels over time, as well as to provide information on their regional and global environmental transport; all countries to prepare a National Implementation Plan (NIP) outlining how they will meet the requirements of the Convention; preparation of a business plan to enhance global partnerships for the development and deployment of alternative products, methods and strategies to DDT for disease vector control; adoption of

The Basel Convention technical guidelines on the Environmentally Sound Management of POPs wastes; and investigating methods of eliminating Polychlorinated Biphenyls (PCBs).

SAICM has only been in existence for three years and is therefore still in early stages of implementation in Africa. SAICM has widespread acceptance and endorsement by African countries. So far activities have focused on awareness creation and capacity-building. Some of the regional activities conducted under SAICM include: African Core Group gathering, Cairo, Egypt, 13-15 June 2006; African regional meeting on SAICM, Cairo, Egypt, 11-14 September 2006; Arab Core Group meeting on SAICM, 29 October 2006; Arab subregional meeting, Cairo, Egypt, 1-2 April 2007; and the second African regional meeting, Dar es Salaam, Tanzania, 14-19 July 2008.

The African region has also been active in the SAICM Quick Start Programme and its Trust Fund. Seventy-six out of 140 project proposals that have been submitted from Governments and 17 out of 45 project proposals from civil society organizations originate from the African region. The Quick Start Programme is providing funding to 29 Government-led projects and four civil society projects in Africa. The approved projects are concerned with the following activities: developing or updating national chemicals management profile and establishing integrated national programmes for sound chemicals management; strengthening capacities to control the transboundary movements of hazardous wastes and chemicals in the context of the Basel Convention; developing Globally Harmonized System of Classification and Labelling of Chemicals (GHS); Implementing the Stockholm Convention; and enhancing safe management of public health pesticides along with other activities.

Some progress is being made toward integration of sectoral policies on chemical management. Such an example is the Controlled Substances Regulations, 2007 (Legal Notice No.73 of 2007) of Kenya that seeks to control and regulate, through appropriate labelling (e.g., Controlled Substance-Not Ozone Friendly), the importation and exportation of certain hazardous chemicals used across several sectors. Some of the African countries, most notably Nigeria, Senegal and the Gambia, have started implementing the Globally Harmonized System of Classification and Labelling of Chemicals (GHS). When fully implemented, GHS will provide a more integrated approach to chemicals management, not only in Africa, but globally.

National Chemical Profiles

Some African countries have made good progress with development of their national chemical profiles and subsequent strategies and action plans, even though means for their implementation are still to be secured.

Morocco initiated the development of the National Profile on Chemicals' management in 2005 with the aim of assessing the national capacity of chemicals management, identifying existing weakness and available expertise, and analysing the nature, availability and use of chemicals in Morocco. A Strategy and National Action Plan for Chemicals Management has also been developed and endorsed for implementation, which will assist in reducing the impact of chemicals on the environment and promote sustainable development.

The Federal Ministry of Environment in Nigeria (FMENV) produced a National Chemical Profile in Nigeria in 2000 with the cooperation of relevant Ministries, Non-Governmental Organizations [NGO] and the academia. This document provides a blue print for integrated chemicals management in Nigeria.

In Tanzania, a national chemical and pesticides database and website (www.saicmtz.or.tz) has been developed to strengthen information exchange and sound chemicals management.

Promotion of Best Practices

National Cleaner Production Centres (NCPCs) support the introduction of better chemicals management practices and techniques in particular in the business sector. The NCPC Programme is a joint initiative of United Nations Industrial Development Organization (UNIDO) and United Nations Environment Programme (UNEPP) that since its inception in 1994, established Centres in 11 African countries (Egypt, Ethiopia, Kenya, Morocco, Mozambique, Rwanda, South Africa, Tanzania, Tunisia, Uganda and Zimbabwe). The level of success varies between these centres in terms of national ownership and sustainability of the NCPCs as well as in the scale, sector-distribution and focus of their activities and impacts.

Some NCPCs operate specific programmes for chemical industries (e.g. South Africa) or for other chemical-intensive sectors (for example tanneries in Ethiopia), whilst other NCPCs deliver dedicated services for environmentally sound management of chemicals, including new business models like chemical leasing in different manufacturing sectors (e.g. Egypt and Morocco). An example of a chemical leasing initiative from Egypt is provided in box 3.8, while two Cleaner Production case studies in South Africa and Tanzania are summarized in box 3.9.

Box 3.7: Chemical Leasing – Examples from Egypt

The concept of Chemical Leasing (ChL) is service-oriented where a customer pays for the benefits obtained from the chemical, not for the substance itself. Consequently the economic success of the supplier is no longer linked with the physical quantities of chemicals used. The chemical consumption becomes a cost rather than a revenue factor for the chemicals supplier who will then try to optimize the use of the chemical and improve the conditions for recycling in order to reduce the amount consumed, which again reduces environmental pollution and risks posed to human health. ChL is a key element of sustainable chemicals management systems.

The Egyptian NCPC coordinated several Chemical Leasing projects, including:

- Cleaning equipment with hydrocarbon solvent
- Powder coating for electrical equipment
- Fluxing process in hot dipping galvanising by molten zinc

As an example, in the first project, Dr. Badawi Chemical Works supplied the hydrocarbon solvent and provided supervision and recommendations for the application of solvents for cleaning purposes at General Motors Egypt. The amount of chemical waste was reduced because the supplier also takes back the solvent waste for recycling at its plant. The improved use of chemicals and machines through the implementation of ChL achieved a 20-fold reduction in solvent use in some applications. Overall benefits included: reduction of energy consumption by more than 40 per cent; cost reduction for cleaning by 15 per cent (saving of raw material with recycling); reduction of solvent consumption from 1.5 l per vehicle to 0.85 l per vehicle; and minimization of hazardous waste in accordance to environmental regulations and international environmental corporate policy.

Source: <http://www.chemicalleasing.com/>

In general however, NCPCs still need to upscale their level of activities and impact in order to effectively catalyse better chemicals management in substantive parts of the business sectors of their home countries. Moreover the network needs to be expanded to cover the whole continent. Cleaner Production also needs to be mainstreamed into industrial policies specifically and overall national development and poverty eradication policies and strategies as a way of fostering sustainable development and the emergence of green industries and of more sustainable patterns of consumption and production.

The role of industry in environmental improvements is becoming more widely recognized as they are both centres of technological expertise that is essential for green business initiatives as well as a major (but not exclusive) source of potential environmental damage and risks to human health. Many firms have started to drive initiatives that are aimed at helping them improve their environmental performance through for example, knowledge sharing or setting up of industry benchmarks for environmental performance and occupational, community and consumer safety. In Africa, such green business initiatives are most developed in the more advanced economies where the scale of industrial production is relatively high and the industrial sector contributes significantly to national GDP. This has been seen for example, in South Africa, where the chemical sector makes attempts to green itself through such initiatives as the Responsible Care and Enviromark Programmes.

Responsible Care® is the chemical industry's global voluntary initiative under which companies, through their national associations, work together to continuously improve their health, safety and environmental performance, and to communicate with stakeholders about their products and processes. The Responsible Care® ethic helps the chemical industry to operate safely, profitably and with due care for future generations, and was commended by UNEP as making a significant contribution to sustainable development at the World Summit on Sustainable Development in 2002.

Responsible Care was first conceived in Canada and launched in 1985 to address public concerns about the manufacture, distribution and use of chemicals. The number of chemical industry associations embracing the Responsible Care ethic has grown from 6 to 53 countries since 1992 when Agenda 21 was adopted at the Rio Earth Summit. Most countries, where English is not the first language, have translated the Responsible Care name to convey the same message as far as possible.

Box 3.8: Cleaner Production Examples from the Chemicals Sector

Case Study 1: Cleaner Production at plastic recycler (www.ncpcsa.co.za)

Background

The NCPC-SA embarked on a CP project with East London based plastic recycler Collectall. The project included an introductory training session on CP to the management staff and a CP assessments of the Company's production process. An initial visit of the site showed potential risk of the site for fire due to lack of proper raw material handling and storage system. Production output was running at approximately 50 per cent of design output due to desperately needed refurbishment of the extruder.

Cleaner Production Solutions

Solutions found included options to optimise energy use such as the installation of variable speed drives and recovery of heat from flue gas; improved stock handling; and a review of the washing plant to increase production capacity. Maintenance issues such as the refurbishment of extruder barrels and screws were also recommended. Better operation of the extruder also reduced plastic wastage and potential for exposure to chemicals in the workplace.

Benefits

Implementation of these options would result in reduced plastic waste, reduced energy consumption and a savings to the company of more than R 7 million. Payback was expected within the first year.

Case Study 2: Cleaner Production in a Chemical Industry in Tanga, Tanzania

Background

Tansilica Ltd is a small private company located at Tanga that produces sodium silicate at an average annual capacity of 4800 tons. The major operations of the plant include mixing, feeding and heating the raw materials in a furnace and then taking out the product. Unloading of the hot product was done manually. This created a health hazard to the workers due to the high heat of the products. Moreover, there were a lot of spillages of the product on the floor which created unsafe working conditions due to the nature of the product (glass type). The quality of the final product was also not good. The company participated in a cleaner production programme conducted by the Cleaner Production Centre of Tanzania during 2001/02. The CP programme consisted of plenary sessions and hands-on-training at the enterprise.

Cleaner Production Solution

The CP options at the plant were aimed at minimizing energy consumption, improving the Occupational Health and Safety of the workers and improving the quality of the product. One of the identified options was installation of a conveyor system for unloading the output products from the furnace.

Benefits

The change improved the quality of the product and reduced solid waste on the working floor leading to improved working environment and Occupational Health and Safety of the workers. The total investment for this option was only \$ 5,000 with a net annual savings of \$ 2,360.

Source: UNIDO, 2009c.

Other Activities

Sound management of chemicals also requires some quantification of chemicals flows and stocks. Especially obsolete stocks of pesticides and other hazardous chemicals are of concern due to their long-term effects, and identification, containment and ultimately disposal of stockpiled chemicals is therefore urgently needed. Of particular concern are obsolete chemicals stored in communities, including pesticides by farmers, pharmaceuticals in health clinics and chemical reagents in schools, laboratories and companies, often in small quantities but lacking appropriate safeguards. In Africa, the African Stockpiles Programme (ASP), a global programme supported by the Global Environment Facility (GEF), is active in this area. Prominent partners of the programme include the World Bank, the Food and Agriculture Organization of the United Nations (FAO), the United Nations Environment Programme (UNEP), and the World Wide Fund for Nature (WWF), the AU and NEPAD.

The objective of ASP is to clean up and safely dispose of all obsolete pesticide stocks in Africa, and to establish preventive measures to avoid future accumulation so as to protect human and environmental health. Implementation of the ASP is so far at its first phase, covering seven countries: Ethiopia, Mali, Morocco, Nigeria, South Africa, Tanzania and Tunisia. In each of these seven countries, there is some data pertaining to either stocks of obsolete pesticides or estimated amount of imports of the same, e.g., it is estimated that there are about 400 tonnes of obsolete pesticides in 76 sites in Mali, while the programme has been able to report that Ethiopia imports about 4,000 tonnes of pesticides annually.

Africa is also making good progress in phasing out leaded petrol. By 2004, more than half of petrol sold and consumed in the continent was unleaded, and that figure has probably since risen. The two initiatives that have been sensitizing African governments on the need to phase out leaded petrol are the World Bank's Clean Air Initiative for sub-Saharan Africa and UNEP's Partnership for Clean Fuels and Vehicles (PCFV). This has mostly been through conferences consisting of technical discussions and ministerial sessions.

However, these efforts in phasing out leaded petrol might be overshadowed in the long run in the fight against lead exposure in general if other sources of lead are not looked into. This is certainly the case currently where the focus has been in phasing out leaded petrol while taking no note of other sources of lead, notably in imported and locally formulated leaded paints and imported toys. Studies that can inform policy to regulate such products are only beginning to emerge in Africa.

Concerns of heavy metal poisoning are not only restricted to lead, but are also extended to other heavy metals like cadmium and mercury. The latter is especially of importance in Africa due to its extensive use in small-scale and artisanal mining.

Box 3.9: Global Mercury Partnership

The UNEP Global Mercury Partnership was created under the auspices of the UNEP Mercury Programme, pursuant to the 2005 UNEP Governing Council decision on chemicals management. The Partnership is a coalition of governments, non-governmental organizations, industry, academia, international organizations, and other interested stakeholders, which share resources and coordinate efforts to safeguard the environment and protect the public health from the risks posed by mercury contamination. The Partnership seeks to achieve immediate results where possible and lay the appropriate groundwork for future progress, and helps to implement the objectives of the Strategic Approach to International Chemical Management (SAICM).

The partnership area has the following priority actions:

- a. Identify environmentally sound collection, disposal and treatment techniques for mercury waste following a lifecycle management approach;
- b. Assess environmental impacts of current waste management practices and processes, including providing support to countries to assess their national situation and needs.
- c. Promote awareness and education regarding mercury waste.

One of the initiatives under this was the Global Mercury Partnership is the Global Mercury project. The Global Mercury Project (GMP) is a six-country project implemented by UNIDO with GEF funding that introduced cleaner gold mining and extraction technologies in order to minimize or eliminate mercury releases. It also aimed to develop the capacity and regulatory mechanisms that will enable the sector to minimize negative environmental and human health aspects of mercury use in gold mining. Africa's GMP implementing countries were the Sudan, Tanzania and Zimbabwe. In addition, UNEP has undertaken rigorous assessments on mercury, cadmium and lead, which amongst other has lead to start of negotiations on a legally-binding instrument on mercury.

3.4 Implementation challenges and constraints

The overall situation with regard to environmentally sound management of chemicals in Africa consists of a number of elements. There is an inadequate awareness of the possible risks posed by chemicals among major segments of the African population. This is further complicated by the general lack of reliable data and information on toxicity, safe use and disposal practices for chemicals. Furthermore insufficient cooperation in development and transfer of appropriate, accessible and affordable technology of safe chemical substitutes and in development of production capacity and very slow progress in defining national, subregional, regional and international best available technologies/safe chemical alternatives makes that the chemicals risks in Africa remain inadequately identified and hence management.

Most African countries still lack the institutions and facilities to monitor chemicals, in particular hazardous chemicals. These countries then have difficulties in developing appropriate control strategies to prevent adverse impacts on human health and the environment.

Inadequate financial and human resources and insufficient political support constrain the development of chemicals policy, including the implementation of SAICM. This lack of comprehensive chemicals policy, combined with insufficient enforcement of promulgated legislation to improve sound chemicals management and poorly defined roles of various stakeholders constrains the sound management of chemicals.

African countries have limited capacity to effectively participate and engage in negotiations on international chemicals and other environmental agreements. This is further complicated by the proliferation of meetings under the various MEAs.

Each of these factors individually as well as collectively is aggravated by the continuing and further proliferation of chemicals in all spheres of life, leading to import, manufacture, distribution, use and disposal of greater volumes of more diverse chemicals and chemical-containing products. The following sections deal in detail with the most urgent challenges for putting in place the key ingredients for environmentally sound management of chemicals.

Multilateral Environmental Agreements: Even though African countries have acceded to and ratified chemicals-related MEAs, domestication and implementation at national level has been lagging somewhat behind. Until MEAs have been transcribed into national legislation and appropriate instruments and institutions created, MEA aims and objectives cannot be attained. Box 9 shows some challenges faced by African countries in implementing (MEAs).

Box 3.10: Challenges faced by African countries in implementing MEAs

- Lack of national and regional chemicals management policy and programmes;
- Limited or complete lack of collaboration among countries in the region;
- Lack of financial support to maintain established activities in the region;
- Lack of adequate capacity of existing regional structures such as the Stockholm Convention/Basel Regional Centres;
- Limited involvement of regional structures such as AU-NEPAD, UNECA and AfDB programmes dealing with environmental and health issues;
- Lack of regional approaches to the management of hazardous chemicals in relation to environmental and health issues on the continent;
- Lack of chemical management issues national and regional development agenda; and
- Lack of collaboration within programmes with more or less similar objectives such as the Regionally Based Assessment of Persistent Toxic Substances.

A contributing factor to this slow pace of domestication of MEAs on chemicals is their diversity and scope, which is beyond the immediate absorption and implementation capacity of many African countries.

Without domestication of an international convention and political will, mere accession to a convention cannot prevent issues such as illegal trafficking of chemicals and inappropriate waste trades in the continent. In 2005 in Côte d'Ivoire, 530 tonnes of toxic waste was transferred from the vessel Probo Koala, a Panamanian-owned ship, resulting in serious damage to human health and the environment. These incidents were committed despite the fact that Nigeria and Côte d'Ivoire are Parties to the Basel and Bamako Conventions, both of which restrict the trans-boundary movements of hazardous and other wastes.

There is therefore the need for active cooperation in areas such as comparative analysis of chemical wastes between international and national chemicals inspection units at entry and export points to prevent the recurrence of such incidents. There is an urgent need to invest in facilities and institutions for monitoring and evaluation of key chemicals in the environment as a basis for national, subregional and regional priority setting for chemicals management. This needs to be accompanied by proper mechanisms for information exchange among African countries, building upon existing initiatives like Pesticide Action Network (PAN)

and Chemical Information Exchange Network (CIEN). The positive contribution of UNEP's African Regional Centres for Chemical Analysis and Data Generation is acknowledged in this regard.

Under SAICM, it is recognized that the scope and longevity of support through the QSP is insufficient in many countries for effective national implementation. Consideration should also be given to developing appropriate guidelines for SAICM implementation taking existing national policies, institutions and chemicals use profile into consideration. African countries have expressed a need for a staged and risk based approach to SAICM. An example of how SAICM was implemented in Tanzania is provided in box 3.11.

Box 3.11: Tanzania leads the way in SAICM implementation

Tanzania was awarded an international bronze medal in recognition of its efforts towards protection of human health and the environment to meet the SAICM 2020 goal at the second International Conference on Chemicals Management (ICCM²) held in May 2009, in Geneva. Currently, Tanzania is implementing four SAICM projects, one of them being a pilot project within an Integrated National Chemicals and Waste Management Programme while the other three are under the Quick Start Scheme.

Implementation of these SAICM activities has progressively strengthened national chemicals management capacity in the following aspects:

- Awareness, knowledge and political will of decision makers on the adverse effects of chemicals has increased;
- Chemical inspectors, health and customs officers at points of entry have been sensitized on chemicals to strengthen chemical inspection activities;
- An interim inter-Ministerial Coordination arrangement involving 13 Ministries to coordinate chemicals management activities and SAICM implementation has been formed at the level of Permanent Secretaries;
- A National chemical and pesticides database and website (www.saicmtz.or.tz) to strengthen information exchange and sound chemicals management has been developed;
- Workers working in sectors related to chemicals of concern from 50 selected sites have been trained on safe chemical handling;
- Technical personnel have been trained to serve as trainers on Environmental Risk Assessment for Sound management of chemicals and chemical wastes;
- A policy framework for stakeholder involvement in SAICM implementation has been proposed;
- A draft national programme on chemicals and waste management and SAICM implementation has been developed; and
- National priorities on sound management of chemicals and SAICM implementation have been identified and endorsed by stakeholders. Among the identified priorities include: (a) to increase public awareness on sound chemicals management; (b) put proper disposal practices in place for waste/expired chemicals and drugs; (c) promote/introduce safe handling practices of chemicals; (d) introduce both regulatory and non-regulatory instruments for managing chemicals; (e) improve enforcement structure of existing legislation and regulations addressing chemicals management; (f) strengthen the chemicals emergency response unit; (g) build adequate national capacity (human and infrastructure) to manage chemicals; (h) improve coordination of chemical management efforts; (i) develop a national chemicals management information system; and (j) to develop/formulate a national policy on chemicals management.

Source: UNIDO, 2009c.

Encouraging partnerships: There is in principle good potential for cooperation and coordination at the subregional level, but implementation support for MEAs and other technical assistance is typically directed at the national level, and therefore not conducive to achieving regional synergies. The initiatives to support regional cooperation include the Basel Convention Regional Centres and the proposed instituting regional centres under the Stockholm Convention.

More support is needed to foster involvement and cooperation of the private sector in the implementation of environmentally sound chemicals management. The private sector has to accept its responsibilities, and the public sector needs to develop mechanisms and capacities to work more collaboratively with user groups in the

private sector and civil society. A particular challenge is effective engagement of the small scale and informal sectors that form a large part of African economies and often operate within residential areas.

Need for Information and Technology Transfer: Awareness of possible risks posed by chemicals is still low among major segments of the African population. This is further complicated by the general lack of reliable data and information on toxicity and safe use practices for chemicals. Access to such information in local languages is key to improving environmentally sound management of chemicals.

There is also a need for streamlining chemical information exchange in the region to include development of National Pollutant and Transfer Registers such as the GHS information exchange on toxic chemicals. Although by 1999 over 22 countries had established their National Pollutant Transfer Register globally, progress has been slow in Africa. The four African pilot countries (South Africa, Senegal, Nigeria and the Gambia) have made good progress with GHS implementation in particular in upstream production of chemicals. Challenges remain in the more informal downstream sector dominated by small and often unorganized businesses that produce chemical-containing consumer and industrial products.

Progress in defining national, subregional, regional and international best available technologies/safe chemical alternatives has been too slow to address the chemicals management challenges in Africa. New initiatives are needed to provide access to best available techniques that are appropriate for and affordable to African nations.

Environmental regulation is a relatively young approach to waste and pollution control, with most environmental legislation having been passed in the past 20-30 years in developed countries, and even more recently in developing countries. African countries face a number of challenges in successfully implementing policy on safe chemical alternatives such as: lack of financial and human resources; insufficient political support; an unsupportive legal environment; lack of clarity regarding the role of government and the intention of policy, leading to lack of ownership and to ineffective policy; and lack of supporting data. Therefore, effort has to be made to accelerate research and development of alternatives to hazardous chemicals deployed in developing countries.

3.5 Lessons learned and recommended priority policy measures and actions

Given that human and environmental health in Africa is strongly linked to socio-economic factors such as population growth, economic growth and poverty, the proposed intervention measures must be implemented in the framework of sustainable development and national poverty reduction and development initiatives. In order to ensure the success of the proposed measures, a range of issues must be taken into consideration.

Development and implementation of policies, programmes, initiatives and MEAs: A strong emphasis should be placed on the integration of the environmentally sound management of chemicals into national policies for economic growth and poverty reduction. This must be linked to integrated approaches in implementing MEAs and other international regimes that are providing support to African countries in their efforts to achieve sound management of chemicals.

SAICM implementation should be promoted for chemicals policy and management, building where possible and appropriate on existing national policies, institutions and chemicals profiles.

Greater emphasis should be given to involvement of the private sector such as civil society; farmers and community groups; research and education institutions (including the cleaner production centres); and related service providers, in the design and implementation of chemicals management policies and strategies.

The implementation of comprehensive inventories of chemicals in African countries should be supported in order to facilitate planning and management of chemicals. Existing programmes and initiatives on destruction of obsolete chemicals and decontamination of polluted sites must be strengthened.

Development and strengthening of institutions and mechanisms for improved information exchanges and access: There is an urgent need to invest in facilities and institutions for monitoring and evaluating key chemicals in the African environment as a basis for national, subregional and regional priority setting for chemicals management. This needs to be accompanied by proper mechanisms for information exchange among African countries, building upon existing initiatives such as the Pesticide Action Network (PAN) and its database and the Chemical Information Exchange Network (CIEN) and developing National Pollutant Release and Transfer Registers and the information exchange on toxic chemicals enabled by the GHS. Access to information on possible risks posed by chemicals and information on toxicity and safe use practises is needed in local languages to increase awareness among the African population.

All African Parties should investigate suitable institutions that can fill the gap of having regional centres capable of providing technical assistance. More emphasis therefore needs to be placed on strengthening the appropriate formal institutional frameworks for the implementation of SAICM and coordination of action at national and subregional levels needs to be improved. For this purpose, Regional Centres, including laboratories, should be strengthened to enable them to fulfil their mandate, particularly in capacity-building, information generation and dissemination and sharing of best practices. This should lead to greater collaboration and information exchange between Governments and relevant industries. The parties should strengthen collaboration with the south/south counterparts with a view to achieving synergy. More support is needed to enable countries of the region to have access to environmentally sound technologies and safe chemicals.

Mechanisms need to be strengthened to ensure the promotion of sound chemicals management in relation to the production and use of chemicals. This should be an integral part of agricultural modernization and sustainable development of manufacturing, service sector and urban infrastructure.

Institutions of higher education and technical and research institutions should play a significant role in adopting and replicating environmentally sound technologies on chemicals and they should play a leading role in the development of affordable and effective alternatives to banned chemicals such as DDT and lindane which have been in the mainstream of public health and agricultural development in Africa.

3.6 Conclusion

Due to high poverty levels, most African countries have prioritised food security, basic health, primary education and other poverty reduction programmes so that less emphasis has been placed on environmentally sound management of chemicals. As a result there is generally a lack of awareness on the effects of hazardous chemicals and institutional frameworks for dealing with the sound management of chemicals are underdeveloped. Endemic diseases such as malaria are still leading killers in the region and the urge to use hazardous chemicals such as DDT is high. However good progress has been made in some areas and many African countries are party to the MEAs that foster the environmentally sound use of chemicals in support of sustainable development objectives.

The legislation framework, regulations and policies on environmentally sound management of Chemicals in most African countries are still young and weak and are contributing to illegal dumping of hazardous chemicals in the region, as well as contamination of water, soil and air resources. Most African countries have put in place an institutional framework to regulate and advise the government on matters related to chemical management and environmental protection in general. However, these institutions have limited human and institutional capacity to address environmentally sound management of chemicals for sustainable development. There are regional programmes and initiatives such as the ASP to clean up the existing large stocks of obsolete chemicals particularly pesticides. However, due to limited resources the pace of implementation in most African countries is slow. There is also limited collaboration between the governments and the CSOs and NGOs in environmentally sound management of chemicals in Africa.

Most African countries neither manufacture nor export chemicals but are mainly importers to support their industrial, agricultural development and protection of public health. This is one of the factors contributing to the general lack of information, awareness creation and advocacy on the harmful effects of hazardous chemicals. This contributes to the mismanagement of chemicals and the use of some chemicals which have been banned in developed countries. Comprehensive inventories of chemical contaminants including POPs in the environment have not been carried out in most countries in the region. This makes it difficult for effective decontamination efforts. Apart from pesticide poisoning, poisoning by other hazardous chemicals such as mercury, lead, cadmium and POPs contamination in humans have not been adequately documented or reported. Most African countries still do not have monitoring, risk assessment and evaluation schemes or action plans on hazardous chemicals in place.

Africa stands to benefit from enhanced compliance with provisions of the chemicals MFAs, in particular through developed countries banning and otherwise preventing the trade and/or transfer of obsolete technologies and hazardous wastes and chemicals. However, Some African countries have still not developed or submitted their National Implementation Plans on chemicals or ratified all major chemical conventions (although progress in other countries in this regard is promising). African countries expect the continuous international support for developing systems for sustainable management of chemicals in the continent, and for the development of green economies in general. This support should also be extended towards helping them achieve their commitments under the JPOI and MDGs through the development of their human, institutional and technical resources.

In general, Africa expects that environmentally sound and sustainable management of chemicals will become an integral element of the financial, technical and other support provided by its development partners. Africa recognizes that its capacity to effectively participate and engage in negotiations on international chemicals and other environmental agreements is limited and expresses its concern that as a result the development needs and priorities of Africa may not have been addressed properly in many of the past negotiations. This is further complicated by proliferation of meetings under the various MFAs, for which preparations and participation by African countries may be inadequate. There is therefore an urgent need for support by Africa's development partners in training African negotiators who can competently articulate its development and environmental agenda in such negotiations.

References

UNEP (2002a). *Regionally Based Assessment of Persistent Toxic Substances*. Mediterranean Regional Report, United Nations Environment Programme.

UNEP (Ozone Secretariat) Web Site (Montreal Protocol): <http://ozone.unep.org/Publications/>

UNIDO Chemical Leasing Web Site: www.chemicalleasing.com

UNIDO (2009a) *Environmentally Sound Management of Chemicals in Morocco*, United Nations Industrial Development Organization for United Nations Economic Commission for Africa, Vienna/Addis Ababa, September 2009.

UNIDO (2009b). *Status of Environmentally Sound Management of Chemicals in South Africa*, United Nations Industrial Development Organization for United Nations Economic Commission for Africa, Vienna/Addis Ababa, September 2009.

UNIDO (2009c). *Status of Environmentally Sound Management of Chemicals in Tanzania*, United Nations Industrial Development Organization for United Nations Economic Commission for Africa, Vienna/Addis Ababa, September 2009.

UNIDO (2009d). *Status of Environmentally Sound Management of Chemicals in Nigeria*, United Nations Industrial Development Organization for United Nations Economic Commission for Africa, Vienna/Addis Ababa, September 2009.

UNIDO (2009e). *Towards Environmentally Sound Management of Chemicals in Africa; A Comprehensive Regional Status Review*, United Nations Industrial Development Organization for United Nations Economic Commission for Africa, Vienna/Addis Ababa, September 2009.

Websites

African Union Web Site (Bamako Convention): <http://www.africa-union.org/>

European Commissions Web site: <http://ec.europa.eu/environment/chemicals/reach>

National Cleaner Production South Africa Web site: www.ncpcs.co.za

Secretariat of the Stockholm Convention fact sheet
http://chm.pops.int/Portals/0/docs/publications/sc_factsheet_002.pdf

Strategic Approach to International Chemicals Management Web Site: <http://www.saicm.org/>

Waste management



4.1 Introduction

Wastes are inevitable by-products of consumption and production processes. Sound management of waste is therefore necessary to avoid substantial adverse human, health and environmental effects that are associated with poor waste management. The typology of wastes generated in Africa from point and non-point sources encompass industrial, agricultural, sewage, municipal and other wastes including wastes from the medical, nuclear, electrical and electronic industry. These wastes can be classified either as non-hazardous or hazardous. Because of health and environmental hazards, waste from the chemical and allied industries and the medical and nuclear sectors requires special attention.

Specific data relating to waste generation and its composition in African countries is generally lacking. Household waste in Africa is known to contain food waste which is biodegradable or compostable. Household waste also consists of sand, gravel, paper, plastic, metals such as aluminium and glass. The last four components are recoverable, reusable and recyclable. Plastic is a major nuisance in municipal solid waste as it contaminates the environment, compromises amenity, clogs drains and causes flooding during the rainy season. Blocking of drains and sewers leads to stagnant water and sewerage which become breeding areas for mosquitoes and pose serious health risks. Table 4.1 illustrates typical waste compositions in some African cities.

Table 4.1: Waste compositions in some African Cities (UNIDO, 2002)

Composition (per cent by weight)	Kumasi Ghana	Accra Ghana	Ibadan Nigeria	Kampala Uganda	Kigali Rwanda
Organic	84	85.1	55.8	75	94
Plastic	-	3.4	6.3	-	-
Glass	-	1.9	1.8	-	-
Metal	-	2.6	-	-	-
Paper	-	4.9	12.9	-	-
Inert	-	-	-	-	-

4.2 Major trends and emerging issues

Waste management problems in Africa are varied and complex. The region is faced with infrastructure, political, technical, social/economic, organizational/managerial, regulatory and legal issues and challenges that need to be addressed to ensure sound waste management and to achieve sustainable development. Waste is typically disposed of without consideration for environmental and human health impacts, leading to its accumulation in cities, towns and uncontrolled dumpsites.

Growing waste volumes

Industrialization, urbanization and modernization of agriculture are needed for poverty reduction and development of Africa but generally require increase in the consumption of industrially-manufactured goods which commonly generate more waste. These trends are predicted to continue into the future. The amount of e-waste will also increase due to growing use of ICT and rapid turn-over of ICT equipment. Likewise, the volume of packaging waste is on the rise with urbanized lifestyles, as is the disposal of short-cycle consumer products. This is an example of the problems that are created as a result of changing lifestyles and consumption patterns particularly in the growing urban middle class in many African cities.

Box 4.1: Agricultural waste in Egypt

The agricultural sector produces in excess of 27 million ton residues annually. Between 79 – 84 per cent of this is rice straw. Approximately 75 per cent of crop residues are reutilized, typically in low value applications for animal bedding, for direct burning, for vegetable storage, or as animal feed. There is an increase in processing of organic wastes into fertilizers and biogas.

At the national level, an estimated 4.422 – 5.684 million ton of crop residues are not utilized. The mean estimate of local damage costs due to air pollution from the energy and agricultural residues sectors was LE 6.5 billion per year in 1999/2000. This is approximately 45 per cent of the damage costs from all environmental degradation and represents a real cost to the Egyptian economy (approximately 1.5 per cent of GDP, corresponding to ~ \$5 per person per year).

Source: Saad, 2009.

Lack of waste management capacity

Waste management infrastructure in rural areas is largely non-existent. Partly as a result of this, proper waste disposal is not carried out in rural areas. Although collection infrastructure and practices exist in most urban areas, the collection rates remain low. In addition co-disposal of non-hazardous and hazardous waste without segregation is common practice.

Municipal Solid Waste (MSW) management has remained an intractable problem in recent times beyond the capacity of most municipal/state governments. This has resulted in refuse heaps being dumped in the urban landscape in heavily populated cities as typically only about 40 to 50 per cent of waste is reportedly being collected. Table 4.2 provides some typical waste generation figures and collection rates for African Countries.

Table 4.2: Solid waste generation and collection rates in African cities (UNIDO, 2002)

City	Per capita annual waste generation (kg/year)	Households with garbage collection (per cent)
Abidjan./Cote d' Ivoire	365	70
Ibadan/Nigeria	401	40
Kinshasa/Congo	438	Not Available
Bujumbura/Burundi	511	41
Lome/Togo	693	37

These poor waste management practices have aggravated the problems of generally low sanitation levels in urban and rural areas resulting in poor hygiene and lack of access to clean water and sanitation. This contributes to high health costs, poverty and further increase in urban migration. The current and expected continuous spread of urbanization, including of informal settlements, which often happens without any waste management planning and infrastructure, is likely to aggravate the challenges.

Waste management problems are worse in African countries such Côte d'Ivoire, the Sudan, Somalia and Liberia that are afflicted by conflict and political instability. These situations provide conducive environments for illegal transboundary traffic of hazardous wastes. Côte d'Ivoire's regrettably experienced in August 2006 an illegal dump of hazardous wastes from Estonia and The Netherlands. The toxic waste invasion in several African countries (e.g. Nigeria, Benin, Togo, Sierra Leone, Guinea and Zimbabwe) in the 1980s by unscrupulous waste merchants from developed countries led to the adoption of the Bamako Convention on the Control of Transboundary Movement of Hazardous Waste in Africa in 1991.

The legal, institutional and administrative framework for the environmentally sound management of waste remains either lacking or inadequate across Africa despite considerable progress in formulation and adoption of waste management policies. Comprehensive national waste legislation is lacking in most African countries although several countries have piecemeal legislation on various categories of waste, in particular for collection and disposal of municipal wastes and for hazardous waste management. In addition several countries have not yet ratified wastes and chemicals related Multilateral Environmental Agreements (MEAs), namely the Basel, Stockholm, and Rotterdam Conventions. A brief summary of the goals and scope of each of these conventions is contained in the introductory section of chapter 3 dealing with chemicals management.

Improper waste disposal in Africa has resulted in poor hygiene and lack of access to clean water and sanitation in particular by the urban poor. Consequently most of the countries in the region may not be able to meet the target set through the MDG of reducing the proportion of people without sustainable access to safe drinking water and basic sanitation by 50 per cent by 2015.

The urgent need to expand, improve and establish waste collection and management systems across Africa, will have to be supported by institutional and legal reforms and changes in attitude. Africa also needs to adopt Environmentally Sound Management (ESM) of wastes including Waste Minimization, focusing on the promotion of the "3Rs" – Reduce, Reuse and Recycle (highlighted in box 4.2); Waste to Wealth Initiatives towards poverty reduction and alleviation; Corporate Social Responsibility by producers of consumer products; and involvement of multiple stakeholders, for example, under the New Partnership for Africa's Development (NEPAD) Initiative. Other options in waste management such as Public-Private Partnerships and Waste Exchange programmes should also be explored.

Box 4.2: Reduce, Reuse and Recycle

3 R's (Reduce – Reuse – Recycle) is an approach that promotes the efficient use of resources and the avoidance of risks to humans and environment from waste disposal, harmonising both environmental and economic concerns through efforts to reduce, reuse, and recycle materials and wastes. It is mostly applied to consumer goods, and to consumer behaviour.

Reuse

The best way to manage waste is to not produce it. This can be done by shopping carefully and, for example, buying products in bulk, avoiding over-packaged goods, avoiding disposable goods but rather buying durable goods. Daily practices can also reduce waste like making two-sided copies, using cloth napkins instead of paper napkins or using a dish cloth instead of paper towels. Businesses and other organizations alike can also reduce the amount of process and other wastes they generate, through changes in their operating procedures, technology choice, production planning, better maintenance, etc.

Reuse

It makes economic and environmental sense to reuse products. Products can be reused for the same purpose for example by repairing broken appliances, furniture and toys. Products can also be reused in different ways, for example by using plastic microwave dinner trays as picnic dishes. Products can be sold through charity shops or recycling shops. The most widely used example is the use of re-usable shopping bags instead of the thin film plastic shopping bags.

Recycle

Recycling involves a series of steps that takes a used material and processes it back into a recycled material that can be used to produce either the same or different new products. Recycling of metals, paper and glass have been common practice for decades, even though recovery rates have remained low in many parts of Africa. Many countries already have some form of collection and separation system for recyclable materials in place. Consumers need to be stimulated to buy products made from recycled material.

The gap between waste management policy and legislation is widening due to the prevailing capacity constraints or even non-existence of suitable waste management facilities. This will require major investments and access to technical know how. It also requires good planning practices, appropriate collection systems that suit the local situation, separation and recycling facilities and final disposal in environmentally acceptable manner. The means for this are mostly lacking.

Waste management practices and technologies

Waste management in the region suffers from limited technological and economic resources as well as poor funding which collectively result in the prevalent low standards of waste management. This is exacerbated by public perception of waste disposal as a welfare service issue and hence the reluctance to pay for waste disposal especially among the poor. Box 4.3 highlights management options for key waste streams.

Box 4.3: Management options for key waste streams

Key waste streams in Africa include Medical Waste, Construction and Demolition Waste, Municipal Solid Waste, and Hazardous Waste. Each of these waste streams has its own specific treatment and/or disposal requirements.

Construction and Demolition Waste consists of construction materials such as concrete, wood, cabling and metals. The biggest volume is made up from brick and concrete materials that can be processed into aggregate that can be re-used in other construction projects.

Medical waste requires a hygienic disposal in line with internationally accepted health practices. The most widely practiced method of treatment of medical waste is incineration. Inappropriate incineration, however, is a potential source of unintentional Persistent Organic Pollutants, particularly dioxins and/or furans.

Municipal Solid Waste contains many different materials, and is now typically dumped, with some informal recovery taking place by scavenger communities on major dump sites. The organic fraction can be composted, to produce compost for use in agriculture or horticulture, or digested to produce biogas. The fraction with high calorific value can be incinerated for energy recovery. Different recyclable fractions might also be present, including paper, plastics, glass and metals, that are ideally removed prior to final treatment or disposal of the residual waste fractions.

Hazardous waste streams are generated from households (smaller volumes) or industrial and commercial installations. Hazardous waste requires controlled disposal in a controlled landfill site, or incineration in a facility with adequate environmental controls for air emissions and ash treatment and disposal.

Due to their reliance on agriculture and agro-processing, most African countries produce large volumes of organic wastes, including cropping and livestock residues. New and upcoming technologies provide opportunities for processing these wastes into energy (e.g. fermentation into ethanol, digestion into biogas, pyrolysis into liquid fuel or gasification into a fuel gas) and compost or fertilizers. Many African countries have identified these opportunities and a growing number of initiatives in this direction have been started.

International cooperation

Within the framework of international trade, overseas buyers increasingly demand evidence of environmental responsibility including sound waste management. In order to capture opportunities for trade with industrialized countries, African countries will have to harmonize their trade and environmental policies.

4.3 Implementation progress and achievements

African countries are taking actions and are making some progress towards sound waste management. Many countries in the region have made progress in formulating and adopting waste management policies, legislation and strategies aimed at minimising the generation of waste and ensure sound management of waste. Box 4.4 contains examples of the hazardous waste management legislation adopted by Kenya and Zambia.

Box 4.4: Hazardous waste legislation in African countries

Example 1: Kenya

According to EMCA (1999) it is the responsibility of the generators of hazardous waste to manage their waste. Management of hazardous waste particularly POPs are being addressed by domesticating the Stockholm Convention. The Government of Kenya banned the importation and use of pesticides containing aldrin, chlordane, dieldrin, endrin, heptachlor, HCB, mirex and toxaphane. According to records of the Pesticide Control Products' Board (PCPB), no pesticide POPs have been imported into the country since 2001. However, some may have found their way into the country illegally.

Example 2: Zambia

The Hazardous Waste Management Regulations Statutory Instrument No. 125 of 2001 provides for the control of hazardous waste so that the waste is managed in an environmentally sound manner through waste prevention, reduction, recycling, incineration and land filling. The regulations further provide for control of generation, collection, storage, transportation, treatment, import, export and final disposal of hazardous waste. The management of hazardous waste follows the provisions of the Basel and Bamako Conventions.

Sources: Kapindula, 2009; and Nyankang'o, 2009.

Africa still almost exclusively relies on land disposal of solid wastes. Few sanitary landfills have been established. Among the few sanitary landfills in operation, some are implementing landfill gas collection and/or composting. In several cases, landfill gas collection has been made possible with co-funding under Clean Development Mechanism (CDM). However, use of collected landfill gas as fuel for power generation as carried out at the Dar es Salaam landfill, for example, is by far more desirable than flaring of the landfill gas.

Several countries have also introduced integrated waste management strategies that incorporate Reduce, Reuse and Recycle principles (3R) with benefits accruing to the local communities as well as private entities involved. In this regard, many African countries have recycling initiatives, especially for paper, plastics, scrap metals and glass. The following boxes 4.5 and 4.6 illustrate application of this in South Africa and Egypt.

Box 4.5: Separation, sorting and recycling of commercial and industrial waste in South Africa

Waste Plan is a Cape Town based on-site waste management company that specializes in recycling and landfill reduction. The company works for commercial clients (e.g. shopping centres) and industrial clients and manages any client's waste on-site in such a manner that it saves money and reduces the amount of waste sent to landfill. On-site separation and sorting of the waste increases the amount of waste available for recycling and recovery and decreases the amount of commercial and industrial waste that goes to landfill. The separation, sorting, and cleaning by Waste Plan staff creates employment through the creation of low skilled jobs. A waste audit is done, and the reduction of the waste sent to landfill is calculated, as well as the savings for the company.

The example from Egypt contained in box 4.6 below shows an increased emphasis on recycling to reduce waste for land filling.

Box 4.6: Waste Management in Cairo

Cairo alone generates about 10,000 ton /day of solid waste. Only 6,000 -7,000 ton thereof is collected (60-70 per cent), leaving 3,000-4,000 tons daily to accumulate in the streets or to be open burnt with evident impact on the air quality and human health.

The Zaballeen have had a traditional role as a garbage-collecting community in Cairo. The garbage collection system has depended on door-to-door collection, and the collected waste usually has been transported by donkey-drawn carts (more recently by trucks). The collected wastes were transported to Zaballeen settlements for manual segregation to enable recycling of the recoverable fractions, such as paper, plastics, glass, metals, and cloth, and processing of recoverable materials. After separating out recyclable and organic materials, the sorted garbage was then passed onto various enterprises, owned by Zaballeen families for eventual resale.

While maximum recovery was achieved at Zaballeen settlements, aesthetics and hygiene at their settlement areas were unacceptable. It was estimated that in Cairo over 30 per cent of the municipal solid waste was treated for recycling by the Zaballeen. The total amount of recycled waste is considerably low when compared with the generated amount. It is estimated that only two per cent of the generated waste (210 ton/day of a generated 10,000 ton/day) or 3-3.5 per cent of the collected waste (210 ton/day of 6000-7000 ton/day) are recycled. Cairo has now adopted a more advanced recycling approach in order to decrease the amount of waste that requires land filling. It has established solid waste recycling facilities, operated by either international or local companies. This is part of contracts with waste management companies to provide essential waste management services including cleansing, production of compost, construction of sanitary landfills, and construction of treatment units for waste. Design-Build-Operate (DBO) contracts of landfills have been awarded after competitive tendering to international operators in different districts in Cairo.

Source: Saad, 2009.

In the same vein, some countries have made progress towards improving waste collection and recycling initiatives, including through community based approaches, such as waste recycling projects aimed at poverty reduction and job creation. This is mostly so for industrial waste, but also for municipal waste, as for example through the Dynamic Youth Enterprise initiative in Addis Ababa (box 4.7) and in south Africa (box 4.8).

Box 4.7: Dynamic Youth Enterprise: waste collection and recycling in Addis Ababa

Rapid population growth and high rural-urban migration pose many socio-economic and environmental challenges in Addis Ababa, including the accumulation of waste on open lands, in drains and in residential areas. Apart from being a nuisance, it also produces foul-smelling pools, pollution, flooding due to clogged drains and adds to the ever present risks of epidemics.

Dynamic Youth Enterprises (DYE) was formed in 1998 with the aim of addressing the solid waste problems in Addis Ababa, while at the same time also providing employment for the youth and street children of the city. DYE started with collecting solid waste from a few households and public dumpsters in the city for a nominal monthly fee collected per household. At the start four youngsters were employed and a rented utility truck used for transport. Later on DYE changed to using manually pushed carts to provide more jobs and increase viability. By 2002 the enterprise employed 150 youth to collect waste from 3,000 households. During 2003-2004 a compactor and lifter was acquired enabling DYE to deliver services to institutional clients. From then on DYE has expanded to pilot various community based resource recovery projects, including composting. It has also been instrumental in setting up other youth based enterprises that engage youth in collection of waste and recycling, which has created the 'solid waste movement'. It is estimated that this movement by 2009 employed several thousands of unemployed and destitute youth in the city.

Source: United Nations Environmental Programme (UNEP), 2009.

Box 4.8: Involvement of the formal and informal sector in waste recycling

The City of Cape Town has put requirements in waste management tender documents for waste minimization aimed to encourage contractors to develop partnerships with existing recycling initiatives instead of replacing them. A subcontractor engaged by a principal contractor to collect and sort recyclables had entered into an informal agreement with 20 informal waste collectors in the area covered to assist him with the collection of bags and recyclables from households.

The main reason why he involved informal collectors was to stop them from tearing open bags, taking what is useful and leaving the rest on the street. The contractor paid the informal collectors 50ct/kg of recyclables collected. After two years, 11 of the 20 collectors have continued this agreement with the contractor. Three of the 20 collectors now have permanent employment with the contractor.

As demonstrated by example of the olive industry in Morocco contained in box 4.9, Resource Efficient and Cleaner Production (RECP) methods and practices have been successfully applied to reduce the generation of wastes from businesses and other organizations in different parts of Africa. RECP is being promoted through the network of National Cleaner Production Centres (NCPCs) which was in 2009 operative in 11 African countries (Egypt, Ethiopia, Kenya, Morocco, Mozambique, Rwanda, South Africa, Tanzania, Tunisia, Uganda and Zimbabwe).

Box 4.9: Waste Minimization through Cleaner Production in Olive Oil Extraction Unit in Morocco

An alternative technology for olive oil extraction for an Industrial Olive Oil Extraction Unit was proposed by the National Cleaner Production Centre (NCPC) in Morocco. The new technology required an investment of 4 Million Euros. The plant has an annual production of 2000 Tons / year. With the new technology a good quality of olive oil (Vierge Extra) could be produced. This made exports to EU and USA possible. The new technology achieved 95 per cent water savings and all the resulting olive residues can be used as fuel source, so that zero solid waste remains. It also provided 15 per cent energy savings by the use of solid waste as a bio-fuel. The waste water discharge was reduced by 2 million units.

Several African countries continue to produce energy through direct combustion of agricultural residues such as bagasse from the sugar cane industry, straw, sawdust, and cotton and coffee husks. The application of advanced small scale digesters to produce biogas, compost fertilizer and/or animal feed from organic waste fractions have been widely accepted in Africa as best practice, and progress is being made in developing and implementing specific projects in various countries.

As indicated in box 4.10, organic residues (including cropping and processing residues) can in principle be processed into bio-fuels and such does provide a good opportunity for rural development and improving energy security in Africa. Already, production of ethanol from some organic wastes such as molasses is widespread, and further opportunities are available for other organic wastes such as rice straw and carbon dioxide recovery from ethanol production.

Box 4.10: Bio-fuels from Waste

Bio-fuels are renewable fuels produced from organic materials derived from biological sources. These materials can be processed into fuels through biological processes in particular digestion into methane (biogas) or fermentation into ethanol. Alternatively, thermo-chemical processes can be deployed, including gasification (producing a synthesis gas) and pyrolysis (producing charcoal and oil and gas fractions). Simple mechanical processing such as size reduction, dewatering, compacting and/or briquetting can also be applied to produce consistent solid fuels.

Lignocellulosic agriculture wastes (rice straw, corn stover, sugar cane residues,) are abundant and in many cases represent environmental problems when burnt in the field. This biomass is considered a good candidate with high potential for bio-fuel production. The potential sources are however located over vast agriculture areas. It is estimated that only 20-40 per cent of the agricultural residues (especially rice straw) can be easily collected and delivered to processing plants located within a reasonable distance (60-70 km).

Technologies to convert lignocellulosic materials to bio- fuels are in the phase of R & D, pre-pilot and pilot plant phase. The potential routes are based on biochemical (hydrolysis) or thermo-chemical (gasification and pyrolysis) conversion. Thermo-chemical conversion is technologically more complex and may therefore not be feasible in most of Africa. Biochemical conversion is a mature technology and in a final stage of implementation and could be implemented with the extensive experiences of industrial fermentation in other industries (distilleries etc.).

There is a good chance to use crop residues as a tool for local rural development by introducing bio-ethanol refinery industry. Briquettes generated from agricultural waste may also be used.

Some countries have started banning the use of specific disposable products, mostly the use of plastic packaging.

Most African countries have ratified or acceded to relevant international instruments, including the Basel Convention. In addition, African countries have adopted the Bamako Convention on the Ban of the Import into Africa and the Control of Transboundary Movement and Management of Hazardous Wastes within Africa. However, only 27 countries have ratified or acceded to it. The Protocol on Liability and Compensation for Damage Resulting from Transboundary Movements of Hazardous Wastes and their Disposal was adopted in Basel in 1999. Although to date, only nine countries have ratified or acceded to the Protocol, seven of which are from Africa.

In accordance with these Conventions, progress is being made to ensure sound treatment of hazardous waste by establishing appropriate facilities such as incinerators for hospitals, and secure landfills, as for example for medical wastes in Kenya and hazardous waste in Egypt highlighted in boxes 4.11 and 4.12 below. However, co-disposal in non-compliant disposal sites is still widespread.

Box 4.11: Management of medical waste in Kenya

The Ministry of Health under the Kenya Immunization Programme (KEPI), has invested large sums of money in the purchase of De Mont Fort incinerators for the management of healthcare wastes,

In the management of these incinerators, personnel handling the waste do not always wear protective clothing during collection, transportation and storage. The De Mont Fort incinerators often do not reach the required 500°C, do not have air pollution control equipment installed and are often overloaded with waste compromising combustion efficiency. Feed materials especially waste containing chlorine such as PVC articles lead to the generation of dioxins and furans.

In the past, absence of a national policy on healthcare waste management led to different institutions practicing different systems in their waste management. However, a National Policy on Infection Safety and Healthcare Waste Management in the country provides a framework for managing medical waste. Until such a time that other waste disposal methods that would meet this medical waste disposal policy requirements with social approval, incineration will continue being the method of choice.

Source: Nyankang'o, 2009.

Box 4.12: Hazardous waste management in Egypt

In Egypt, a hazardous waste landfill (Nasreya) was constructed with financial support from Government of Finland. It receives hazardous waste from all over the country. It is the first central general hazardous waste treatment and disposal facility in Egypt. The operational procedures in place enable the tracing of waste within the facility from the point of acceptance until its final disposal in one of the cells of the landfill. A waste acceptance policy was developed for the landfill that includes general specifications about the chemical and physical properties of waste to be accepted, as well as lists of waste types and/or streams that satisfy such general specifications. Treatment processes carried out at the initial phase of operation of Nasreya entail physical treatment through solidification in solar evaporation ponds followed by burial of the waste in a secure landfill. Subsequent stages of operation would entail other physical treatment (such as solidification in cement blocks) as well as chemical treatment. Recently, the Egypt Environmental Affairs Agency licensed one of biggest cement companies, the Egyptian Cement Company (ECC), to accept and incinerate some combustible organic hazardous wastes in its cement kilns. ECC will however remain primarily a cement plant and not a waste treatment or a recycling plant. Consequently, addition of sorting, treatment or recycling units for wastes is not in the plan of the company. The company uses the waste as an alternative fuel in its kilns and the high temperatures therein ensure effective destruction of the combustible organic chemical wastes.

Source: Saad, 2009.

4.4 Current and future implementation challenges and constraints

Infrastructure and technological challenges: The single largest implementation challenge remains creation of infrastructure and facilities with sufficient capacity for environmentally sound management, including reuse and recycling, of all waste in Africa and creation of appropriate systems and incentives for source reduction, segregation at source and collection. Progress towards its realization is constrained by access to information on waste volumes and composition, technical, institutional and organizational capacity, prevailing attitudes, and access to technology and finance.

Effective control over imports is needed to avoid entry of second hand goods and substandard products that cause waste volumes to rise and its complexity to increase.

Implementation and enforcement of waste regulations and conventions is severely constrained by issues related to good governance and transparency, both generally as well as specifically for the management of wastes.

Inadequate awareness and appreciation of best practices for environmentally-sound management of waste is a major constraint. A paradigm shift towards viewing wastes as a resource waiting to be used is needed among the public at large.

Institutional and organizational issues: Most countries do not have national policies for waste reduction at source, and the existing laws are more focussed on collection and disposal than on recycling and recovery. Responsibility for waste collected has most commonly been explicitly vested in municipalities and municipalities. These have therefore by default also become responsible for waste management. Most municipalities are ill-equipped for waste collection and management. The legal responsibility of municipalities to collect wastes has already turned out to be an impediment for private sector investment in waste management.

Waste management is ranked low compared to other national development goals, regardless of the fact that poor waste management practices are detrimental to improving access to clean water, sanitation and good health.

There is a lack of capacity and stakeholder involvement in development and implementation of integrated waste management strategies and policies throughout government, industry and society.

It is difficult to recover the high investment and operational costs for waste management as there is general reluctance to pay for waste management services. This makes it difficult to invest in waste collection and disposal equipment and facilities.

Government, research and private institutions have not been able to collect and make available sufficient information on the composition, and volume of the different waste streams.

Waste management practices: Waste Management practices in most countries only cover part of the life cycle of waste (from the reduction of its generation at its source through collection, transportation, recycling and recovery, to land-filling and final disposal).

There are few incentives for source reduction and segregation. The efficiency and coverage of collection systems is low (estimated at ~ 40 per cent in urban areas). This low efficiency is partly due to limited availability of vehicles and lack of maintenance, and the related high cost for local governments (up to ~30 per cent of local government budget is spent for waste collection and management only).

Recovery and recycling takes place in inefficient and low-tech manner, mostly through random sorting and recovery by scavengers on streets and at dump sites. Recycling facilities for example plastics, organic wastes and other recyclables are often lacking.

The increasing demand for landfill space due to the growing urbanization is not met, and most landfills do not meet basic environmental controls, and uncontrolled burning is common practice.

Despite these challenges and constraints, there is a proven potential to reduce waste generation from businesses and other organizations, through such initiatives as industrial and commercial waste minimization (or Resource Efficient and Cleaner Production).

4.5 Lessons learned and recommended priority policy measures and actions

The involvement of the private sector and partnerships with local communities in solid waste management activities have created employment and job opportunities to a substantial number of jobless city residents, many of whom were previously unemployed women and youths. Involvement of the private sector and improvements in access to managerial and technical know how and finance will further enhance this.

Solid waste management is an important income-generating activity. Both high and low skilled jobs can be created throughout the life cycle of waste (collection, transport, recycling & recovery, land-filling and cleaner production implementation). Income generated is not only from wage payments but also from sale of items recovered from the solid waste.

Some cities have well developed cost recovery systems for refuse collection, which forms a good source of income for City and Municipal councils. It is necessary to exchange knowledge and experience in Africa on the successful experiences that can be replicated.

The manner in which solid waste was previously managed is gradually changing. For example, there are increasing signs of waste being segregated at source and to a large extent, being collected and stored in waste bins. Sorting is being done at communal waste collection points with noticeably organized groups of people.

Specific priorities for improving environmentally sound management of wastes in Africa include: transfer, adaptation and dissemination of knowledge and technology, including investments, to achieve and widely replicate best practices in environmentally sound management of various waste streams in Africa; implementation of relevant international agreements/conventions on waste management (particularly Bamako, Basel and Cotonou) and assistance for African countries to strengthening their national human and institutional capacities for implementation and enforcement; and ratification of a protocol on liability and compensation for damages under the Basel Convention.

Waste Reduction: Waste management policies and strategies should provide a clear incentive for waste reduction, as reduction of the volume or its complexity is fundamentally the preferred waste management strategy (prevention principle). There is ample evidence that waste reduction is possible and often profitable, through process and operational changes and waste segregation at the source of the waste, equally in enterprises, households or farms. A promising way to foster the culture and practice of waste reduction is through group based approaches, where consumers, businesses and/or farmers meet under the guidance of experienced facilitators to discuss practical ways to reduce waste, for example through the Waste Minimization Clubs in

South Africa (see box 4.13). There is need at country level to enhance capacity-building and create awareness on the importance and benefits of cleaner production, which include waste reduction as well as gains in productivity and competitiveness.

Box 4.13: Waste Minimisation Clubs in South Africa

Waste Minimization Clubs (WMC) are groups of companies that work together to reduce waste and save money. They consist of between 10 and 15 companies, either from the same sector, or from different sectors. Clubs have so far been formed in the industrial, commercial and public service sectors.

Each company that joins a Club becomes a Club member and appoints a project champion to represent them at Club meetings, which are managed by experienced facilitators. Meetings are held on a regular basis, generally monthly or bimonthly. At these meetings, Club members exchange information, ideas and experiences in waste minimization. Training in waste minimization practices is also provided.

As of October 2006, there had been a total of 25 successful Waste Minimization Clubs in South Africa, with a total of 272 member companies. A study of the potential financial savings of 11 WMCs around Cape Town in South Africa indicated that total savings of over \$10 million were achieved through reductions in consumption of water, energy and raw materials, and reduced volumes of wastes and emissions. The average saving per company reached almost \$100, 000 annually.

Other waste reduction initiatives include refurbishment centres that endeavour to extend the useful life of equipment. After rigorous testing and replacement of dysfunctional parts of discarded equipment, the refurbished equipment is sold under warranty to new users at a more affordable price level. Interest in refurbishment of ICT equipment has been on the rise in recent years, due to the dual needs to bridge the growing digital divides between Africa and industrialized countries and make use of an expanding waste stream of discarded electronic equipment (see box 4.14).

Box 4.14: Refurbishment centres

In June 2007, UNIDO and Microsoft announced the **Refurbished Computer Initiative for Small and Medium Entrepreneurs** in Africa. This joint initiative created a bridge between companies discarding used computer equipment and small and medium enterprises in Africa that could refurbish and repair the equipment for on-sale to small and micro-enterprises and individuals. Microsoft through its know-how with refurbished PC solutions and UNIDO through its experience in SME development, have the opportunity to help address the problem of electronic computer waste, while stimulating SME development and growth.

The first refurbishment centre was inaugurated in 2008 in Uganda. It provides computers, software and training to entrepreneurs, and thereby seeks to contribute to creating jobs and realising business opportunities in small enterprises in Africa. The UNIDO-Microsoft initiative sets stringent quality criteria for refurbished computers, including warranties and after-sales service. Since electronic waste is a global problem, the agreement also stipulates ways for the eventual disposal and recycling of obsolete computers.

Integrated and coordinated waste Management: Integration and coordination of waste management plans among different sectors and levels of government and with stakeholders in the private sector and civil society is essential to achieve waste reduction. The current waste management experience demonstrates that formal organizations alone cannot deal adequately with the increasing volumes and complexity and diversity of urban wastes. A partnership approach (including for example Private-Public Partnerships (PPPs)) should therefore be considered.

It is important that policies and comprehensive waste and hazardous waste management strategies, in short, integrated waste management, are developed and implemented, including where necessary creation and strengthening of relevant institutions for monitoring and enforcement. Integrated Waste Management addresses all waste streams and sources and covers the full life cycle of each waste including reduction and segregation at source, collection, recycling, recovery and disposal. They have to support pro-poor involvement in waste management as a source of employment and hence income generation. The enforcement of the legislation that supports these plans is often not strong enough.

The development and dissemination of appropriate technologies and practices for environmentally sound management of various waste streams needs to be accelerated. A multi-sectoral plan should spearhead the development and dissemination of appropriate technologies and practices for environmentally sound management of wastes. Application of various economical, efficient, cost effective and environmentally friendly waste recovery techniques and technologies should be adopted as ways of disposing wastes.

It is important to promote and improve the ongoing training of various stakeholders on environmentally sound management of wastes using the existing institutions and integrating it into curricula at different school levels. The capacity of Environmental Agencies and Local Authorities should be strengthened to enhance participation of stakeholders in the implementation of the waste management plans. Continued training and sensitization among media personnel can increase community participation by boosting the general awareness on impacts of waste on human health and environment.

Proper structures should be created to collect data on types, sources and composition of wastes to enable planning and investment and independently monitor and evaluate achievements.

Authorities and private partners should charge appropriately for waste collection. This can encourage the private sector and enable NGOs to initiate new projects. The efficiency of waste collection and transportation can often be improved. Investments are needed to bring in more collection trucks that are appropriate to the composition of various waste streams in Africa.

Appropriate incentives can promote the usage of recycled, recyclable and/or biodegradable items for daily use, or the reuse of agriculture waste as a source of energy. Further recycling and re-use of waste can be promoted through the creation of regional networks. Disposing of wastes should be carried out in controlled landfills to prevent any contamination of water and soil. Co-disposal of hazardous and medical waste with general waste should be avoided. For public health reasons it is especially essential that medical waste receives adequate treatment.

Multilateral Environmental Agreements: It is important for the those African countries that have not yet ratified the Multilateral Environmental Agreements for hazardous waste (including Basel and Bamako Convention) to do so in order to achieve their aims and objectives through domestication of the provisions in national legislation and preparation and implementation of National Implementation Plans. Challenges around the ratification and eventual implementation of the Bamako Convention and the Protocol on Liability and Compensation of the Basel Convention have to be addressed at various levels through the African Union.

Appropriate financial instruments and other means of implementation complementary to the Regional Centres under the Basel convention have to be put in place to accelerate the implementation of the **Basel convention**.

A particular challenge pertains to responsible transboundary movement of hazardous waste. Concerns remain about illegal trafficking of such waste. There is a need to strengthen trans-border controls through better cooperation between neighbouring countries and education of border control officers and community at large in border regions.

Of growing concern are imports of used consumer goods that contain hazardous materials (e.g. electronic and electric products, cars, medical equipment, pharmaceuticals etc.). There is a need to strengthen import regulations in a coordinated manner at a regional and international level. Producer Responsibility regulations can also play a role here.

Special wastes: It is important that African countries prepare inventories of hazardous wastes and contaminated sites. Comprehensive inventories of hazardous and radioactive wastes and of sites potentially affected by poor management of such wastes or chemicals are required to secure sites and minimize risks to humans and the environment. This also provides the basis for the development and implementation of clean-up programmes to remove and safely destruct hazardous materials, and remediate affected soils.

There is an urgent need to improve the exchange of information on radio-active wastes. The IAEA needs to cooperate more actively with African countries on minimization and management of radio-active waste. The planning and management capacities of the relevant authorities for radioactive wastes need to be strengthened so that capacity for environmentally sound management, transport and storage of radio-active wastes is ensured. The management of radio-active wastes of such facilities should be planned as an integral part of developing the energy mix.

It is important to comprehensively identify sites that potentially have been contaminated with radio-active wastes in Africa. While African countries acknowledge the importance of sound management of radio-active wastes, the capacity to do so remains still very low across Africa, as only few countries (e.g. Egypt) have given priority to develop and implement comprehensive radio-active waste management systems.

The management of radio-nuclides mined either intentionally (uranium) or as by-product with other metallic ores (e.g. gold, cobalt etc.) has to observe environmental safeguards. This equally applies to imported products that contain radio-active materials (e.g. medical applications) and the management of the waste thereof.

4.6 Conclusion

Progress is being made in Africa to develop and implement policies and regulations concerning the collection and management, including recycling, recovery and environmentally sound disposal, of various waste streams. Waste streams continue however to increase and diversify, a trend expected to continue into the foreseeable future due to population growth, industrialization and urbanization, and much needed socio-economic development and poverty reduction initiatives. The resulting picture is one of a widening gap between agreed waste management policies and standards and actual waste management practices.

There is therefore an urgent need to support the transfer and dissemination of knowledge and technology and foster investments in best practices for environmentally sound management of various waste streams within the African continent. The scale of necessary investments for proper sanitation and environmentally sound management of wastes is beyond the capacity of African countries.

The relevant international agreements/conventions on waste management (particularly Bamako, Basel and Cotonou Conventions) require urgent implementation which requires support to strengthen the national human and institutional capacities of African countries for implementation and enforcement (especially for control of imports and exports of wastes and waste containing products into and within the region). Moreover the protocol on liability and compensation for damages under the Basel Convention needs to be ratified and implemented.

References

Saad, Hassan (2009). Environmentally Sound management of Waste in Egypt: A National review (UNIDO).

United Nations Economic Commission for Africa (2008). Sustainable Development report on Africa – Five year review of the Implementation of the World Summit on Sustainable Development Outcomes in Africa (WSSD+5).

Kapindula, David (2009). Integrated assessment of present status of environmentally sound management of waste in Africa. Waste component – Zambia, Final review report (UNIDO).

Mwesigye, Patrick; Mbogoma, John; Nyankang'o, Jane; Afari, Idan; Kapindula, David; Saad, Hassan; and Van Berkel, Rene (2009). Integrated assessment of present status of environmentally sound management of wastes in Africa (UNIDO).

Mohamed Eisa and C. Visvanathan (2002). Municipal solid waste management in Asia and Africa: A Comparative Analysis (UNIDO).

Nyankang'o, Jane (2009). Integrated assessment of the present status of environmentally sound management of wastes in Africa: waste management review in Kenya. UNIDO, September 2009

United Nations Environmental Programme, (2009). Promoting Resource Efficiency in Small and Medium Enterprises in Ethiopia: Case Study Report.

Waste not:-Externalization and the management of waste in Cape Town. Margareet Visser and Jan Theron:
<http://www.plaas.org.za>

<http://www.buyisaebag.co.za/aboutus.aspx>

<http://www.ncpc.co.za/wmc/>

<http://www.unido.org/index.php?id=549>

Mining



5.1 Introduction

Africa is well endowed with mineral resources. It harbours the world's largest mineral reserves of platinum, gold, diamonds, chromite, manganese, and vanadium. Table 1 illustrates Africa's mineral potential and production in global terms. Yet these statistics are probably underestimated due to limited geological mapping of the continent. In addition, the continent produces about 17 per cent of the world's uranium. Most of these minerals are exported as ores, concentrates or metals without significant downstream processing to add value. This has led to the persistent belief that the untapped mineral potential can act as a springboard for Africa's industrialization.

Table 5.1: Some leading African mineral resources, 2005

Mineral	African Percent of World Production	Rank	African Percent of World Reserves	Rank
Platinum Group Metals	54 Per cent	1	60+ Per cent	1
Phosphate	27 Per cent	1	66 Per cent	1
Gold	20 Per cent	1	42 Per cent	1
Chromium	40 Per cent	1	44 Per cent	1
Manganese	28 Per cent	2	82 Per cent	1
Vanadium	51 Per cent	1	95 Per cent	1
Cobalt	18 Per cent	1	55+ Per cent	1
Diamonds	78 Per cent	1	88 Per cent	1
Aluminium	4 Per cent	7	45 Per cent	1

Source: ECA and African Union, 2008.

The African Mining Vision: The African Mining Vision (AMV) was conceived in preparation for the First African Union Conference of Ministers Responsible for Mineral Resources Development. It was drafted by a technical taskforce of the International Study Group (ISG) on Africa's mineral regimes, a project of ECA. The vision advocates for "transparent, equitable and optimal exploitation of mineral resources to underpin broad-based sustainable growth and socio-economic development". The vision is therefore consistent with the principles of sustainable development, wealth creation and the integration of the mining sector into Africa's social and economic development process.

Looking at successful resource-based development strategies elsewhere, it is clear that mineral resources can catalyse broad-based growth and development provided opportunities to “deepen” the resources sector, through the optimization of linkages into the domestic economy, are exploited.

Box 5.1: Africa Mining Vision:

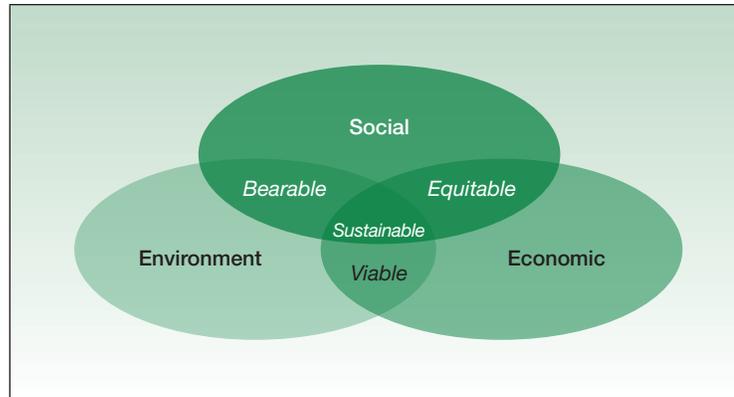
The Africa Mining Vision is: “Transparent, equitable and optimal exploitation of mineral resources to underpin broad-based sustainable growth and socio-economic development”.

This shared vision will comprise:

- A knowledge-driven African mining sector that catalyses and contributes to the broad-based growth and development of, and is fully integrated into, a single African market through:
 - Down-stream linkages into mineral beneficiation and manufacturing;
 - Up-stream linkages into mining capital goods, consumables and services industries;
 - Side-stream linkages into infrastructure (power, logistics; communications, water) and skills and technology development (HRD and R&D);
 - Mutually beneficial partnerships between the state, the private sector, civil society, local communities and other stakeholders; and
 - A comprehensive knowledge of its mineral endowment.
- A sustainable and well-governed mining sector that effectively garners and deploys resource rents and that is safe, healthy, gender and ethnically inclusive, environmentally friendly, socially responsible and appreciated by surrounding communities;
- A mining sector that has become a key component of a diversified, vibrant and globally competitive industrializing African economy;
- A mining sector that has helped establish a competitive African infrastructure platform, through the maximization of its propulsive local and regional economic linkages;
- A mining sector that optimises and husbands Africa’s finite mineral resource endowments and that is diversified, incorporating both high value metals and lower value industrial minerals at both commercial and small-scale levels;
- A mining sector that harness the potential of artisanal and small-scale mining to stimulate local/national entrepreneurship, improve livelihoods and advance integrated rural social and economic development; and
- A mining sector that is a major player in vibrant and competitive national, continental and international capital and commodity markets.

Sustainable development and mining: Mining by nature is inherently unsustainable in that the life of the mine is limited and will eventually come to a close. However, its sustainability can be ensured by the linkages (downstream, upstream and side stream) it forms with other sectors of the economy. Sustainable development as defined by the World Commission on Environment and Development (WCED) in its Brundtland Report - Our Common Future (WCED, 1987) is “development that meets the needs of the present generation without compromising the ability of future generations to meet their own needs”. However, this widely used definition focuses on intergenerational equity and a further expansion of the standard definition was made during the 2002 World Summit on Sustainable Development, using the three pillars of sustainable development: economic, social, and environmental¹. The Johannesburg Declaration created “a collective responsibility to advance and strengthen the interdependent and mutually reinforcing pillars of sustainable development at local, national, regional and global levels.”

1 April 2005 issue of Environment: Science and Policy for Sustainable Development, Volume 47, Number 3, pages 8–21.



Scheme of sustainable development at the confluence of three constituent parts²

During the colonial era in Africa, the mining sector was used to develop the economies of western nations with no attention to the sustainable development of the sector. This has not changed much in the post-colonial era. Although the benefits of mining to national economies are evident, local costs (environmental and social impacts) associated with mining, especially to local communities, are not being adequately compensated for. The mining sector reforms of the 1980s and 1990s under the auspices of the World Bank (WB) and International Monetary Fund (IMF) did not help the situation as they were aimed at attracting Foreign Direct Investments (FDIs). The reforms also received criticism for the magnitude of special incentives offered to mining companies. The reforms have arguably reduced the share of rent, on which African governments depend, to fund their social and economic development programmes. There is also the argument that mining has not been mainstreamed into development-oriented policies, as exhibited by weak linkages into the local, regional and national economies.

Dependence on mining rent alone can hamper development by shifting focus from broader economic development issues and the expansion of other productive sectors. This often relates to the so called Dutch Disease or Resource Curse in which high mineral revenues limit structural diversification; and economies fail to translate resource abundance into sustainable growth that uplifts peoples' lives. Ideally, mining should spur the development of spin-off sectors that supply mining companies with a range of inputs. These sectors, although initiated by mining, can be applied to other development areas of a country, thus precipitating the lateral migration of mineral-related technologies.

5.2 Major trends and emerging issues

Generally, there has been a dramatic increase in the global metals intensity of use since adoption of the JPOI. This is unlikely to decrease despite the recent global economic crisis and the drop in commodity prices, due to the robust demand from growing Asian economies such as China and India. The increased metal intensity of use has caused historically high metal prices which have permitted the mining of lower grade and difficult-to-access ores, resulting in higher energy use and more waste. The commodity boom and subsequent economic crisis have also resulted in a greater concentration of global mining capital (mergers and takeovers), while there has been a reduction of junior exploration and mining activity. This has led to a decline in African exploration and an increase in the bargaining power of the large mining companies, and consequently their leverage on the negotiation of mineral contracts with African States.

² Sustainable development –Wikipedia.

There has been improved stability in the political and economic environment and this has led to increased investment in the African minerals sector, but very limited or no investment in the minerals linkage sectors. There is also an emergent realization that mining could be a key instrument in establishing infrastructure (transport, energy and water) for the development of other sectors, such as agriculture and forestry. This is embodied in the NEPAD Sustainable Development Programme (SDP) initiative and also in the AMV. The following trends have been observed in the specific areas under review.

Effective and transparent regulatory regimes: There has been a growing trend to accommodate the socio-economic development imperatives of host countries. Consequently, there have been increased calls for national mining policies and legislation to embrace broader development goals as reflected, for example, in the AMV. This includes considerations for the mineral value chain in the socio-economic development context of the country, closure of mining operations and reclamation of land for other uses.

Legislation has been moving towards streamlining reporting requirements while reducing arbitrary discretionary powers of administrative offices. The recent high commodity prices have generally brought about the realization that mining contracts have been skewed in favour of mining companies. The equitable sharing of benefits has therefore emerged as a key issue with mining countries seeking improved contracts. At the subregional level, harmonization of mining codes and policies has also emerged as a key trend.

Transparency and accountability: Contracts between governments and mining companies are often performed in secrecy, with confidentiality clauses that prevent the public (the owners of mineral wealth) from knowing exactly what revenues are given to the State and what rights and privileges have been awarded to the mining companies. In essence, this stems from inadequate democratic governance structures and institutional capacities in the area of revenue management. These drawbacks are compounded by a weak civil society that cannot engage government in revenue accounting matters. To increase transparency and accountability, there has been a trend towards increased membership in the Extractive Industries Transparency Initiative (EITI) and the emergence of Extractive Industries Transparency Initiative Plus Plus (EITI++) and the Kimberley Process Certification Scheme (KPCS)³. EITI++ is the World Bank's extension of EITI to extend transparency in the oil, mining and gas sector beyond the focus on revenues to look at how concessions are awarded, contracts negotiated, and how the money is spent. KPCS is a joint government, industry and civil society initiative to stem the flow of conflict diamonds, that is, rough diamonds used by rebel movements to finance wars against legitimate governments.

There has also been an increase in the participation of CSOs, NGOs, and communities in initiatives such as the Revenue Watch Institute⁴, which is a non-profit policy and grant-making institute that promotes the responsible management of oil, gas and mineral resources for the public good. It does this on the premise that effective revenue management, citizen engagement and real government accountability, natural resource wealth can drive development and national growth and Publish What You Pay⁵ (PWYP), which is a global civil society coalition. The coalition helps citizens of resource-rich developing countries hold their governments accountable for the management of revenues from the oil, gas and mining industries.

3 [Http://www.kimberleyprocess.com/](http://www.kimberleyprocess.com/)

4 [Http://www.revenuewatch.org/](http://www.revenuewatch.org/)

5 [Http://www.publishwhatyoupay.org/](http://www.publishwhatyoupay.org/)

Box 5.2: The EITI Principles and Criteria

What is now known as the EITI process evolved from the first statement of the EITI Principles at the EITI Conference in 2003. The EITI Principles and EITI Criteria are the most concise statement of the beliefs and aims of the Initiative. These beliefs and aims are endorsed by EITI stakeholders, supporters and implementers alike.

The EITI Principles

The EITI Principles, agreed at the Lancaster House Conference in June 2003, provide the cornerstone of the initiative. They are:

We share a belief that the prudent use of natural resource wealth should be an important engine for sustainable economic growth that contributes to sustainable development and poverty reduction, but if not managed properly, can create negative economic and social impacts.

We affirm that management of natural resource wealth for the benefit of a country's citizens is in the domain of sovereign governments to be exercised in the interests of their national development.

We recognize that the benefits of resource extraction occur as revenue streams over many years and can be highly price dependent.

1. We recognize that a public understanding of government revenues and expenditure over time could help public debate and inform choice of appropriate and realistic options for sustainable development.
2. We underline the importance of transparency by governments and companies in the extractive industries and the need to enhance public financial management and accountability.
3. We recognize that achievement of greater transparency must be set in the context of respect for contracts and laws.
4. We recognize the enhanced environment for domestic and foreign direct investment that financial transparency may bring.
5. We believe in the principle and practice of accountability by government to all citizens for the stewardship of revenue streams and public expenditure.
6. We are committed to encouraging high standards of transparency and accountability in public life, government operations and in business.
7. We believe that a broadly consistent and workable approach to the disclosure of payments and revenues is required, which is simple to undertake and to use.
8. We believe that payments' disclosure in a given country should involve all extractive industry companies operating in that country.
9. In seeking solutions, we believe that all stakeholders have important and relevant contributions to make – including governments and their agencies, extractive industry companies, service companies, multilateral organizations, financial organizations, investors, and non-governmental organizations.

The EITI Criteria

Implementation of EITI must be consistent with the criteria below:

1. Regular publication of all material oil, gas and mining payments by companies to governments ("payments") and all material revenues received by governments from oil, gas and mining companies ("revenues") to a wide audience in a publicly accessible, comprehensive and comprehensible manner.
2. Where such audits do not already exist, payments and revenues are the subject of a credible, independent audit, applying international auditing standards.
3. Payments and revenues are reconciled by a credible, independent administrator, applying international auditing standards and with publication of the administrator's opinion regarding that reconciliation including discrepancies, should any be identified.
4. This approach is extended to all companies including state-owned enterprises.
5. Civil society is actively engaged as a participant in the design, monitoring and evaluation of this process and contributes towards public debate.
6. A public, financially sustainable work plan for all the above is developed by the host government, with assistance from the international financial institutions where required, including measurable targets, a timetable for implementation, and an assessment of potential capacity constraints.

Source: <http://eitransparency.org/eiti/principles>

Governance and public participation: Governance in the context of this report relates to the legal and institutional environment in which various actors in the mineral sector interact. Generally, there has been a trend towards improved multi-stakeholder interactions with greater community participation in benefit sharing, and consultations moving from a paternalistic to a partnership approach. There has also been an increase in multi-stakeholder involvement in the development of mineral policy and legislation. African participation in ownership of mineral assets has increased as demonstrated by South Africa's Black Economic Empowerment (BEE) initiative, as has gender awareness and female involvement in mining and mine ownership.

Environmental, economic, social and health impacts and benefits: Increase in the negative environmental impacts caused by mining activities, coupled with disruption of local social values, traditional norms and livelihoods have resulted in environmental and social requirements becoming major features of national mining legislation. Such requirements include environmental and social impact assessments (ESIA) prior to the granting of mineral licenses and environmental and social funds. The increased use of ESIA's has partly benefited from companies subscribing to international standards, such as the UN Global Compact, the Global Reporting Initiative, the IFC Performance Standards, the Equator Principles, and the Universal Declaration of Human Rights and associated agreements, and the OECD Guidelines for Multinational Enterprises.

This has had the effect of improving corporate social responsibility, with mining companies taking the view that corporate social responsibility (CSR) is part of doing good business. Also, communities around mining areas have a newly found sense of entitlement and increasingly demand economic benefits, a healthy environment and respect for human rights around resource extraction areas. A negative environmental trend, however, is the increase in energy consumption, due to the minerals boom. This has caused greater reliance on fossil fuels (hydrocarbons and coal) with concomitant deleterious environmental impacts.

From an economic viewpoint, the reforms of the 1980s and 90s have opened up many African countries to private mining investment. Yet this shift has not always been beneficial, as governments are forced to make major concessions to attract mining capital into their economies due to strong global competition for such capital. Taxation of the minerals industry remains an issue between governments and mining companies due to the perceived conflict between what constitutes just compensation for the risks mining companies take and equitable resource rents accruing to the owners of mineral wealth. There is a trend, though it lacks unanimity, towards sharing tax revenues between central, regional and local governments with local communities receiving a proportion of mining taxes.

Value addition, research and development and technological information: Despite available opportunities, very little value is added to Africa's mineral products. On the contrary, the increased commodity demand has led to an increase in exports of ores and concentrates. This has led to increased calls for development-oriented mineral policies which include instruments to increase value addition. There is also increased awareness that value addition encompasses more than mineral processing, and includes all aspects of the mineral value chain, such as local inputs and services into the mineral sector. Further, there is the realization that research and development, and technological information are the basis for creating value added to the minerals sector.

Artisanal and small-scale mining; ASM is usually a labour-intensive sector and hence presents a greater opportunity for job creation than do large-scale operations, especially in rural areas. There is the realization that strategies for artisanal and small-scale mining must be rooted into broader rural development plans and that greater support needs to be provided to address a range of shortcomings including technology, marketing, and skill deficiencies. There has been growing awareness to address the poor environmental and healthy practice characteristic of ASM. It is further recognized that ASM has negative impacts associated with child labour and the impoverishment of miners. The formation of the Communities and Small Scale Mining initiative in Africa (CASM-Africa) has been able to communicate the importance of ASM and potentially positive development influence it can have.

CASM is a global networking and coordination facility, launched in 2001, with a mission to reduce poverty by improving the environmental, social and economic performance of ASM in developing countries. It works with companies, governments and civil society up to engaging in international development policy dialogues. CASM currently has three regional networks – one in Africa, one in Asia and another in China and has five projects on women empowerment, artisanal gold mining, conflict diamonds, promotion of alternative livelihoods and institutional capacity-building.

Although it was launched in 2001, CASM-Africa held its inaugural meeting in 2005, in Addis Ababa, Ethiopia. Members of CASM-Africa agreed that the new organization will function as a regional partner of the multi-donor CASM Global network whose secretariat is hosted by the World Bank in Washington DC, USA. Its role is to develop and share knowledge, build networks, facilitate projects, provide an advisory service and review functions on ASM with the goal of transforming ASM into profitable enterprises within sustainable communities. The establishment of CASM-Africa was of importance particularly for Africa's efforts to implement the NEPAD chapter on mining. Through partnership with CASM Global, CASM-Africa will be a key conduit and platform for establishing critical in-country and locally owned programmes on ASM within Africa.

The Yaounde Vision on Artisanal and Small Scale Mining: “Contribute to sustainably reduce poverty and improve livelihood in African Artisanal and Small-scale Mining (ASM) communities by the year 2015 in line with the Millennium Development Goals”. The vision was adopted during a joint ECA/UNDESA Seminar on “Artisanal and Small-scale Mining in Africa: Identifying Best Practices and Building Sustainable Livelihoods of Communities”, held in Yaounde, Cameroon from 18 to 22 November 2002. The Vision is an umbrella framework that will lead the development of this sub-sector in the continent. It has been adopted by CASM-Africa during its inaugural meeting and provides an outline, which will continue to be relevant in the future.

The goals of this vision are to acknowledge and reflect the ASM sectoral issues in national legislation, and codes; mainstream poverty reduction strategies into mining policy inclusive of ASM policies; integrate ASM policy into the PRSP process with linkages to other rural sectors, and develop a strategic framework for PRSPs; revisit existing thinking on ASM legislation (traditional land rights, and the modern land-use legislation nexus) and role of central government; strengthen institutions in terms of improving the availability of appropriate technologies and developing analytical and business skills; undertake necessary reforms of the ASM sector which includes improving policies, institutions, processes and the ASM stakeholders' livelihoods; reduce child labour; ensure gender equality; improve health and safety; develop partnerships; promote sustainable use of natural resources and infrastructure development and improve land-use management.

Building human and institutional capacities: Companies in the extractive industry mostly engage in programmes to improve the health, education, and skills of employees and mining communities, usually as part of their CSR agenda. Extractive companies are also engaged in activities that contribute towards building external institutional capacity that is usually necessary in developing countries to move forward with value addition. Typical activities include providing funding to universities for student bursaries, and support for research centres and professorial chairs.

There has been an increase in technical support for formulating improved mining policies, legislation and guidelines. Partly in response to trends in development cooperation towards ownership, coordination and alignment, there has been a shift from programme funding to budget support to provide flexibility to adapt development aid to local circumstances. Technical support has also been extended to developing and consolidating geo-scientific information into geographical information system (GIS) frameworks, improved environmental and ESIA management processes, and increased attempts to reduce the negative environmental impacts of ASM processing methods, such as reduced use of mercury and cyanide.

5.3 Implementation progress and achievements

Effective and transparent regulatory frameworks: At the national level, most African mining countries have rewritten their mining codes in the last 20 years to reflect a shift from government as an owner/operator to regulator/administrator, with the private sector assuming the lead in mineral development projects. Countries which have gone this route include DRC, Ghana, Guinea, Namibia, Nigeria, Tanzania and Zambia. The new codes have been aimed at attracting FDIs, driven by the need to privatize mining projects and have not necessarily been development-oriented. Many of the new regimes have been driven by the World Bank, IMF and Commonwealth Secretariat and have not generally included broad consultations with key stakeholders. In several cases, however, the new codes have involved extensive consultation as has been the case in Malawi, Namibia and South Africa.

Since the commodity boom of the past three years, and the growing recognition that the original terms and conditions of mining legislation unduly favoured the private sector, there has been a trend towards amending mining codes and re-negotiating mining contracts. Key examples include DRC, Liberia, Sierra Leone and Zambia. There has also been progress in decentralizing administrative systems as exemplified by DRC, Tanzania, Sierra Leone and South Africa. However, devolution has exacerbated existing capacity weaknesses within the executive branch.

At the subregional level, efforts to harmonize mining codes have increased across the continent, emphasizing the need for transparent regulatory frameworks and efficient administrative systems, including one stop shops in mineral licensing and reporting systems. Three subregions namely, the Southern African Development Community (SADC), the Economic Community of West African States (ECOWAS) and the Economic and Monetary Union of West Africa (UEMOA) have made concrete steps towards harmonizing their national policies, laws and regulations and developing common standards to create a uniform business environment for investors. ECOWAS has recently adopted the “Draft ECOWAS Directive on the Harmonization of Guiding Principles and Policies in the Mining Sector”, which seeks to create a common mining code for West Africa, underpinned by a participatory approach, sustainable socio-economic development, poverty reduction, environmental protection, good governance and respect for human rights.

In 2006, SADC adopted a Framework for the Harmonization of Mining Policies Standards and Regulatory Frameworks”. The framework comprises policy guidelines in key areas of the SADC mineral economy namely: mineral development issues such as mineral rights, value addition and ASM; macroeconomic and business climate which include tax issues, governance, environmental management and social (people-based issues).

At the regional level, in 2007, ECA convened the Big Table meeting on “Managing Africa’s Natural Resources for Growth and Poverty Reduction”. The Big Table of 2007 was the last in the series of annual meetings of African Ministers and their OECD counterparts, convened specifically to address the most pressing continental developmental challenge of the day. The outcome of the 2007 Big Table meeting triggered initiatives, such as the Extractive Industries Transparency Initiative (EITI), the African Legal Support Facility (ALSF), and the International Study Group to Review Africa’s Mining Regimes (ISG).

The ISG is a two-phase project established to explore how best Africa’s mining regimes can contribute to Africa’s sustainable development through broad national and regional economic and social development goals. It has been involved in the formulation of the African Mining Vision and has authored a number of study reports to elucidate key elements of mineral regimes in Africa.

Box 5.3: International Study Group to review Africa's mining codes ISG

For the purpose of the ISG's review, a broad view is taken of the expression "mining regimes". It includes policy statements, legislation and regulations, contracts, guidelines, codes of conduct, standards, operating practices, and international agreements applicable to mineral operations.

Key sustainable development objectives to be taken into account include the following:

- To secure national and regional policy space to develop regimes and options that advance developmental goals and are sensitive to national specificities;
- To develop governance institutional capacity to be able to customize mining regimes to suit local developmental needs;
- To ensure that the minerals socio-economic linkages into the local and regional economy are optimized;
- To develop multilateral and regional governance and regulation through e.g. the African Peer Review Mechanism (APRM), the Extractive Industries Transparency Initiative (EITI), and the Regional Economic Communities (RECs); and
- To ensure the development of the minerals sector on a sustainable basis.

Issues to be covered:

To assist in the formulation of a framework for mineral resource development, the following issues, inter alia, will be considered.

Governance and institutional capacity in the mineral resources sector;

- Mechanisms for enhancing the integration of mineral operations into the broader national or regional economy;
- Mechanisms for enhancing local benefits;
- Mechanisms for enhancing local and national employment;
- Mechanisms for ensuring environmental sustainability of the minerals sector;
- Managing and allocating mining revenue;
- land and community rights and relations;
- Gender and child labour in the context of mineral operations;
- global trade and other economic issues affecting the African mining sector; and
- Security of supply.

The study will evaluate and, where judged desirable, develop instruments regarding the following:

- The types of licences required for mineral operations and their incidents;
- The conditions to be satisfied for obtaining each licence;
- The processes by which these may be acquired or granted, including access to information, who makes or Participates in the decision to make a grant, who is consulted and how a decision is made;
- Specifically, of what sort; after what processes; and what obligations they impose;
- Procedures for assessing and regulating social impacts;
- Land tenure: the relationship between the general regime and the mining regime; the impact of mining operations on other interests in land;
- The various elements of the fiscal regime;
- Financial regulations, including exchange control;
- Local retention of earnings from mining;
- Security of tenure provisions: their scope, formulation, location and implications;
- Dispute-settlement provisions;
- Agreements for selling, refining or processing minerals;
- Permits and processes for exporting minerals;
- Industry- and State-reporting requirements;
- Planning for mine closure including environmental, social and economic aspects of closure; and
- Regulatory and monitoring institutions: their respective roles, responsibilities, powers and capacities.

The review will evaluate the entire mining cycle including (a) exploration and extraction, (b) mineral processing and value addition, (c) marketing, and (d) reclamation and mine closure. Cross-cutting issues such as environmental sustainability of mining operations and community interaction will also be assessed.

The “First African Union Conference of Ministers Responsible for Minerals Development”, was held in October 2008 and it adopted the “Addis Ababa Declaration on Development and Management of Africa’s Mineral Resources”. The Declaration called on AUC, in collaboration with ECA, AfDB, the Africa Mining Partnership (AMP), (RECs and other stakeholders, to formulate a concrete action plan for the realization of the AMV as highlighted in box 5.1. The Declaration also reaffirmed Africa’s commitment to prudent, transparent and efficient development and management of its mineral resources to meet the MDGs, eradicate poverty, and achieve rapid and broad-based socio-economic development. To this end, the Ministers undertook to build on the work of the International Study Group (ISG) and improve Africa’s mineral policies, legal, regulatory, and administrative frameworks under the leadership of AU and in collaboration with ECA and the AMP. The Ministers also called on AfDB to operationalize (ALSF, to strengthen the capacity of African member States to negotiate better mineral contracts.

Transparency and accountability: African countries have increasingly signed up to global initiatives, including the EITI, EITI++ and the Kimberly Process Certification Scheme, to improve transparency and accountability in the mineral sector. EITI candidate countries⁶ include Burkina Faso, Ghana, Liberia, Mozambique, the Niger, Nigeria, Madagascar, Tanzania and Zambia. Some countries, notably Liberia and Nigeria, have gone further and developed legislation to require the adoption of EITI principles. These initiatives are largely voluntary and depend upon the interest and will of countries to assimilate and enforce the standards and rules that emanate from them. In some instances, however, there may be external factors that push countries to adopt the standards set by these initiatives. For example, the International Finance Corporation prefers to invest in countries that are implementing the EITI principles. Furthermore, while there are as many as twenty candidate African countries, none appears to have reached compliant status. There is a sense, therefore, that the implementation of these transparency initiatives needs to be speeded up.

Governance and public participation: At the national level, there has generally been an improvement in the participation by communities in mining projects and in benefits accruing to communities. From a policymaking viewpoint, there have been notable examples of countries employing the multi-stakeholder approach as happened in Malawi, Namibia, South Africa and Tanzania. Generally, however, governments still see policymaking and regulation of the mining sector as their sole responsibility. Many African countries do not have sustainable development principles in their national mining policies. Local equity participation in mining projects is also not seriously promoted nor embedded in law as is the case in South Africa. As a result, participation of nationals in large-scale mining projects is not commonplace in many African countries. Countries with empowerment schemes, like South Africa, have fared better, but they are the exceptions.

Improvements in community participation have been facilitated by mining companies subscribing to international CSR-based schemes. While this applies to high profile mining companies, smaller ones are not held to the same standard of accountability. Traditionally, CSR in the mining sector has been voluntary. However, there has been an increasing awareness that CSR must be grounded in some form of policy legislation or other mandatory agreements. Countries that have implemented a legislative approach include Nigeria and South Africa. Other countries, such as DRC, Ghana, Namibia, and Tanzania are increasingly seeking to entrench CSR in their policy frameworks.

At the subregional level, harmonization frameworks, like that of SADC, have embraced the need to have uniform governance and CSR standards. The SADC framework also emphasizes the participation of nationals in mining projects and benefit sharing with communities around mining projects. It further encourages the participation of women in the minerals sector, based on the SADC Gender Protocol.

6 A country that has fully and to the satisfaction of the EITI Board met the sign-up indicators becomes a candidate country. It then has two years to be validated as a compliant country.

Environmental, economic social and health impacts and benefits: Significant national level strides have been made in the inclusion of environmental and social requirements in African mineral regimes. The new legislative and regulatory regimes emerging in most countries now include requirements for an Environmental Impact Assessment (EIA), although less so for social impacts. The requirement for both social and environmental rehabilitation funds is still not very prevalent despite the popularity of EIAs. Even in countries where social and environmental funds are included in the legislative framework, and ESIA is a mandatory requirement, the provisions are often not fully implemented because of capacity constraints within government and the lack of involvement of other stakeholders to enhance compliance. This is for example the case in Tanzania and Zambia.

Agreements between mining companies and communities that include provisions to ameliorate the negative impacts of mining are becoming increasingly common, such as in Mali, Ghana and the DRC. Revenue sharing with communities and local authorities has slowly been increasing although not yet widespread. Most governments still centrally retain all mineral revenue at the national level. Ghana, Sierra Leone and South Africa are among the notable exceptions. Overall, revenues from mineral commodities increased dramatically in 2008 due to buoyant demand particularly from China and India. What is not clear yet is how this has impacted revenue distribution and developmental priorities at the domestic level.

The mining sector does not generally have sufficient economic linkages in most countries. However, new policy frameworks encourage linkages, such as local procurement and employment, and small business development at both the community and national levels. Though desirable, such economic linkages are not, however, widespread with the exception of South Africa, where they are part of social and labour plans. While environmental, economic and social sustainability requires a comprehensive policy on land use, most African countries do not have provisions for land use.

Progress has been made in addressing health and its social impacts relative to mine workers and mining communities. This is largely attributable to improved CSR by mining companies, which offer programmes to help those suffering from HIV/AIDS, malaria and TB. These diseases pose the biggest threat to the health of mine workers, their families and the communities they live in. Mining companies have long since recognized that protecting the health of their workers not only increases productivity but also ensures the longevity of mining projects, particularly at operations with long lifecycles.

A positive development has been the reduction in mineral resource-based conflicts particularly in Angola, Côte d'Ivoire, DRC, Liberia and Sierra Leone. These countries now face the challenges of reconstructing the mining sector through new and effective mineral policies and legislation, renegotiating mining contracts and developing mineral agreements and concessions that guarantee a fair return to the national economies. Even where legislation is in place, such as in DRC, there remains a major challenge of implementation due to the persistent attributes of a war economy in the eastern Congo, in which Government control over mineral resources, at best, is difficult.

At the regional level, the African Legal Support Facility (box 5.4) launched in 2009 by the African Development Bank, should help member States negotiate improved contracts that support the sustainable development of the extractive sector. The facility will operate as a legal and technical service provider to member countries, allowing them access to sound advice in a range of areas that include commercial creditor litigation, debt management and negotiations of complex transactions.

Box 5.4: The African Legal Support Facility (ALSF)

The objective of the Facility is to operate as a legal and technical service provider to member countries, allowing them access to sound legal advice and technical assistance in order to resolve commercial creditor litigation and strengthen their negotiation capacity on issues relating to debt management and negotiations of complex transactions.

The Facility is the product of African Finance Ministers who, in June, 2003, sought a mechanism to help Heavily Indebted Poor Countries (HIPCs) addresses the growing problem of vulture funds. Vulture funds are those funds obtained cheaply by commercial creditors who buy debts cheaply from the debtor countries, often the heavily indebted countries, and lay claim to the full value of such debts.

The UN Economic Commission for Africa in 2005 also called for such a facility. The African Big Table in 2007 called for a facility to help RMCs negotiate contracts and create an appropriate, enabling environment with modern, legal and regulatory frameworks for the extractive resource sector.

The Facility is consequently a demand-driven initiative established in 2008 and launched in 2009. It has an autonomous legal and administrative personality, and it is hosted by the African Development Bank.

It will deliver two types of services: assistance in Vulture Fund negotiation or litigation, and commercial transactions. Planned activities include minimizing the diversion of debt relief gains; strengthening assistance to HIPCs and Fragile States; providing High Level Legal Expertise to countries in Vulture Fund Litigation; and providing funds for hiring qualified law firms in defence of debtor interests in terms suitable for each candidate debtor nation. It will also use procedures created to build knowledge for future use by Government Negotiators; enhance the fiscal viability of projects, particularly in extractive industries, and organize training for negotiators and legal counsel in member states.

Its statutory organs operate on three levels:

- A Governing Council of 12 members serving on a rotational basis—each from the African subregions; four from OECD countries ; one from a non-OECD country, one from AfDB and one from other international organizations;
- A Management Board consisting of 5 members; and
- An Executive Director responsible for management of the Facility.

The AfDB Board of Governors, in 2008, allocated \$15 million to launch the Facility and operationize its activities.

Source: <http://www.afdb.org/en/news-events/article/the-african-development-bank-group-to-launch-the-african-legal-support-facility-4588/>

Value addition, research and development, and technological information: This is a very underdeveloped aspect of the African mineral sector. Many of the industrial and or mineral policy frameworks of African countries do not place sufficient emphasis on beneficiation and creating manufacturing value added. Strategies and incentives for value addition are not well articulated, with a few exceptions like South Africa, which has an innovation fund for research and development (R&D) into value addition to mineral products and excellent infrastructure for R&D in process technology.

Support for value addition to ASM mineral products, mostly gold and gemstones, has also traditionally been weak. However, this is slowly improving. Ghana, for example, has instituted a precious minerals marketing cooperation responsible for jewellery manufacturing and marketing. Similarly, there has been an increase in lapidaries serving the ASM sector in other African countries such as Namibia, South Africa, Tanzania and Zambia.

Generally, in the review of policies, beneficiation and value addition has been increasingly emphasized at all levels including the national, subregional and regional levels. Examples include subregional harmonization efforts in the ECOWAS, UEMOA and SADC subregions, as well as the AMP and African Mining Vision, at the pan-African level.

Artisanal and small-scale mining (ASM): ASM is an integral part of rural Africa. The number of artisanal and small-scale miners is very large, the skills and finances limited, and the operations technologically deficient. The result is often catastrophic in economic, social, environmental and health terms. The sector has seen varied progress in the last few years with several countries, notably Namibia and South Africa, providing a range of support facilities through ASM technology centres. At the *regional level*, the Yaoundé Vision on Artisanal and Small-scale Mining, which seeks to sustainably reduce poverty and improve livelihoods in African ASM communities by the year 2015 (in line with the Millennium Development Goals), continues to provide guidelines for the development of this subsector. ASM has also been facilitated by the formation of Communities and Small-Scale Mining (CASM)-Africa. CASM currently has three regional networks in Africa, Asia and China and five projects on women empowerment, artisanal gold mining, conflict diamonds, promotion of alternative livelihoods and institutional capacity-building. CASM-Africa has adopted the Yaoundé Vision.

Building human and institutional capacities: The last decade has seen an increase in technical assistance by development partners to support mining reform in many African countries such as the DRC, Ghana, Liberia, Mozambique, Nigeria, Sierra Leone, Tanzania and Zambia. In addition to policymaking support, assistance programmes have included support for environmental programmes and management support, such as the training of regulators on computerized licensing management systems (mining cadastres). Retention of professional staff in government ministries is, however, a continuing problem and exacerbates existing weak capacities.

There has been an increase in programmes to address the challenges (technical, economic, social, and environmental) associated with the ASM sector. Partly, this is in response to its potential role in poverty alleviation and the need to integrate it into broad stream economic development activities. Namibia and Zambia have benefited in this regard, while Tanzania and Zimbabwe are signatories to the Global Mercury Project (GMP). This is an initiative of the United Nations in collaboration with governments and non-government organizations. It aims to promote knowledge and capacity-building on the links between small-scale gold mining practices and health, ecosystems, and social factors, and to implement interventions that reduce mercury pollution and exposure caused by mining activities.

5.4 Implementation challenges and constraints

The mining sector in Africa, despite the good progress outlined above, is still faced with a number of challenges that hinder the sustainable development of the sector and, in turn, prevent the realization of fuller socio-economic benefits from it. Some of the challenges are outlined below.

Effective and transparent regulatory framework: Despite improvements in the regulatory frameworks, African mineral regimes are yet to contribute to the creation of equitable and sustainable mineral wealth from the viewpoint of a diversified mining industry, which is integrated into the local and regional economy through optimized linkages, and which does not compromise other forms of land use, environmental, social and cultural considerations. The ineffectiveness of regulatory regimes largely stems from incapacities in monitoring compliance with legislative requirements, especially in technical and business reporting requirements, and in environmental and social management plans. Capacity problems extend to ASM operations whose regimes are inadequate and as such do not facilitate a sustainable and vibrant ASM sector. At the subregional level,

the pace of harmonizing mineral regimes with the RECs, especially in critical areas such as fiscal provisions, remains slow.

Transparency and accountability: The existing fiscal instruments do not optimize the collection of resource rents, such as windfall and additional profit taxes, while negotiating these with major mining continues to pose transparency challenges. At the same time there have been challenges in efficiently using resource rents to ensure long-term economic development and inter-generational equity. Furthermore, governance systems are not effective in addressing rent-seeking tendencies and corruption, and cannot thus entrench transparency and accountability.

The KPCS has been inadequately implemented while there is a clear need to establish similar systems for high value minerals, such as coltan and gold, emanating from conflict zones. This is not, however, achievable without real control over production areas in conflict zones. Popularizing and broadening the adoption and application of international standards, conventions and toolkits resulting from initiatives like KPCS, EITI, EITI++, International Council on Mining and Metals (ICMM), is also a challenge that needs to be addressed. While the voluntary nature of these initiatives is recognized as a systemic weakness, the grounding of these and other CSR initiatives in policy and legislation has its own challenges. These include the weak capacities of stakeholder institutions, which need to provide checks and balances, such as NGOs, community-based organizations (CBOs), and parliament. Furthermore, not all aspects of CSR are amenable to legislation.

Broad-based participation: There is inconsistency in the existence and/or application of instruments and systems to ensure the effective participation of impacted communities and other stakeholders in mining operations. In addition, there exists a dearth of venture capital sources for African entrepreneurs to enter the mineral sector. The risky nature of exploration and small-scale mining activities does not lend these operations to raising financial resources from formal financial institutions.

Environment, economic, health, social impacts and benefit: Implementation of provisions for both social and environmental rehabilitation funds provisions embedded in legislation presents capacity challenges to Governments. Similarly, capacity constraints prevent the full participation of communities in negotiating long-term benefits from mining companies. While the concept is acceptable that mining communities should benefit from operations in their neighbourhood, minerals are considered to be national patrimony and are for the benefit of the citizenry. Balancing and managing conflicting local, sub-national and national level concerns and interests, including deciding what form the allocation should take to promote growth and development in a particular area is therefore a challenge. Mining can also create conflict between communities and mining companies, or between small-scale miners and large mining companies, or even between government and other stakeholders. Mechanisms to identify and settle mineral-related conflicts and disputes, including addressing social, economic and religious concerns, are lacking. These need to be developed and seen to be applied fairly.

Value addition, R&D and technological information: Creating direct and indirect linkages with the rest of the economy remains elusive. Direct up-, down-, and side-stream linkages into mining inputs, beneficiation and human as well as physical infrastructure are needed. There is need to explore the viability of establishing dedicated mineral development funds to assure sustainability through investment into human resource development, research and development, and technology development. It is also necessary to establish indirect linkages by maximizing the use of mineral infrastructure (transport, power and water) to catalyse growth and development in other sectors such as agriculture, forestry and resource processing. Limited investment in the mining sector has led to inadequate geo-scientific information due to lack of systematic geo-mapping. Clearly, many of these problems are related to inadequate funding for operations that rely on the public budget.

Financial, technical and capacity-building support: Overcoming the large mineral infrastructure financing constraints through public private partnerships and the grouping of infrastructure users to achieve economies of scale via integrated development corridors remains a major challenge. The large sums of money involved in

infrastructure projects and lack of capacity for structuring such projects, coupled with unclear regulatory and un-remunerative frameworks all make private participation a challenge. This is especially so in the development of sustainable energy, particularly hydroelectric sources, to cater for the increasing demands from the mining sector.

At the regional level, there is a lack of resources for the effective functioning of the continental partnerships/initiatives such as the AMP, intergovernmental forums, AUC-ISG, UNCTAD-African Mining Network (UNCTAD-AMN), AfDB-ALSF, and NEPAD-SDP. The region is confronted with difficulties in the establishment of a continental fund for world class transaction advisors for the negotiation of large mineral contracts.

5.5 Lessons learned and recommended priority policy measures and actions

Despite the accomplishments recounted in this report the legacy of mining in Africa can be improved. Africa's highest potential for short to medium term-growth and development lies in its generous mineral resource endowment. However, more needs to be done to achieve this. The emergence of resource-demanding players in the commodity market, such as China and India, coupled with increasing concerns for security of long-term supply from Europe and the United States of America, is likely to fuel perceptions of global resource scarcity. This offers Africa distinct opportunities to use its natural resource endowment for sustainable development. Below is a summary of some of the key lessons and actions to be taken.

Effective and transparent regulatory frameworks: There is now a realization that unless the mining sector is rooted in the long-term development imperatives of the national economy, it will continue to operate as an enclave, divorced from the rest of the national socio-economic aspirations of African countries and their peoples. The African Mining Vision, which is instructive in this context, is consistent with the principles of sustainable development and the integration of the mining sector into Africa's social and economic development trajectory. African countries should explore practical ways in which the absorption of mining into long-term sustainable development principles can be achieved. They must invest in new forward-looking, development-oriented mineral regimes that create equitable and sustainable mineral wealth from a diversified mining industry that is integrated into the local and regional economy.

A sustainable development paradigm requires sustainable wealth creation and for mineral dependent economies, this can only come from taxes levied on enterprises dealing in minerals. African fiscal resource regimes should therefore be made more effective in garnering rents from the mineral industry, especially differential windfall rents. Similarly, the skewed mineral development contracts referred to earlier will need to be renegotiated so that they not only reflect a fair return to the investor, but provide development resources for African economies. It is government's responsibility to maximize the retained value of mineral ventures to the national economy through the creation of useful linkages with other economic sectors including employment, manufacturing value added, local purchases and technology transfer.

At the subregional and regional levels, the Addis Ababa Declaration on the "Development and Management of Africa's Mineral Resources" calls on AUC, in collaboration with ECA, AfDB, AMP, the RECs and other stakeholders, to formulate a concrete action plan for realization of the AMV and use this as a vehicle for achieving the MDGs. AUC has already adopted phase two of the ISG project which will craft new generation African mineral regimes during the period 2010 to 2012. It is therefore recommended that AUC, ECA, AfDB, AMP, and the RECs create capacity, in terms of both human and financial resources, to ensure that

action plans, policy templates, tool kits and other instruments are developed for use in revising African mineral regimes.

The new regimes should also improve the pace of harmonization of mineral policies, codes and standards at the subregional levels, given its many benefits stated earlier. Given the lopsided nature of mineral contracts, it is recommended that AfDB swiftly operationalize the ALSF to strengthen the capacity of African member States to negotiate better mineral contracts. In the short term, AUC, AfDB and ECA could explore the establishment of a continental fund to provide access to the use of world class transaction advisors to help negotiate large mineral contracts. This probably needs to be done with the participation of RECs and those African mineral economies dependent on mining activities.

Transparency and accountability: With good transparent governance, the exploitation of mineral resources can foster economic and social growth, and reduce poverty. While transparency and accountability may be desirable, in practice, they are difficult to achieve in Africa. Governance systems in Africa have not yet fully embraced participatory approaches, which harness the collective potential from a diversity of stakeholders. Systems to promote transparency, including EITI and PWYP are viewed suspiciously by the executive, especially due to the participation by NGOs and (Community Based Organizations) CBOs. There is need to accept the fundamental premise that (Publish What You Pay) PWYP and EITI campaigns cannot improve transparency and accountability if they do not include broader national constituencies such as political parties and the legislature, which all work to improve democratic values, accountability and good governance.

Member countries should seriously consider the adoption and application of minerals conventions emanating from the KPCS, EITI, EITI++ as well as other systems such as ICMM toolkits and codes for hazardous substances (mercury and cyanide). A useful way to improve transparency and accountability is to develop a think tank approach, which includes politicians, NGOs and academics, to address issues raised by stakeholders, including the State, communities and mining companies. This has a far greater developmental role. This approach, however, entails necessarily strengthening the capacities of CBOs and NGOs, as well as those of the legislature, to provide checks and balances to the executive. On their part, it is recommended that African States should ensure efficient use of resource rents in order to secure long-term socio-economic development and inter-generational equity.

At the subregional and regional levels, it is recommended that the AUC-AMP, in collaboration with RECs, should ensure the effective implementation of KPCS in member countries and that other similar systems for coltan and gold are established to address the issue of high-value minerals emanating from conflict zones.

Governance and public participation: Governance systems need to be rooted in broader participation by communities in mining decisions that affect them and CSR cannot continue to be exercised in a wholly discretionary manner. CSR and governance systems should therefore be embedded in policy and legislative provisions, where possible. Examples from South Africa, which has a strong governance tradition, as part of the Social Charter, are instructive. The Charter also has a strong component on the participation of nationals in the ownership and management of mineral assets as part of BEE.

The above lessons should be broadened to other African mineral regimes. Countries should establish and strengthen legislative instruments and systems to ensure the effective participation of impacted communities and other stakeholders in decisions that affect them. Such instruments should include provisions for the participation of nationals in mineral ventures. They should also ensure balance in the management of conflicting local, sub-national and national concerns and interests, including determining the levels of revenue allocation to promote growth and development in mining areas. The systems should also cater for the identification and amicable settlement of mineral-related conflicts and disputes, including land rights, social, economic and religious concerns.

A useful approach is to consider introducing mineral concessions, or other mineral rights allocation system, that emphasize the uplifting of the community and enhanced post-mining economic activity for communities. Such concessions need to be associated with monitoring systems that guarantee environmental and social management plan compliance.

At the subregional and regional levels, AfDB, in collaboration with the RECs and their member States, should consider the establishment of mineral venture capital funds to enable African entrepreneurs Junior Resource Companies (JRCs) to enter the mineral sector. The high entry costs created by the nature of risk associated with the mining industry are probably the single largest deterrent to the participation of African nationals in mining activities.

Environmental, economic and health impacts and benefits: While the incorporation of environmental and, to a lesser extent social, provisions in policy and legislation have been improved, their implementation has not kept pace with such improvements. The main lesson to be learnt therefore is that good legislative provisions are not a sufficient basis unless the will and capacity to implement them exist.

Member countries are therefore urged to ensure that ESIA's are mandatory and part of legislations, mineral concessions or mineral development agreements, and that they include obligatory social and environmental remediation funds. To this end, social and environmental funds should include physical deposits, bonds and insurance schemes to ensure that when a mine goes bankrupt; its responsibilities are not externalized to hapless communities. Governments, on their part, should allocate resources to create capacity to audit and monitor environmental and social commitments. Mining companies too should realize that environmental and social responsibility is in their long-term commercial interests. The culmination of the ISG work has documented how the presence of a mine in a poor rural community is often viewed as a small enclave of wealth existing within a sea of poverty. Thus, the mine and its perceived wealth are highly visible and the pressure to share this wealth with the local areas that have near to no development is immense. Civil unrest initiated by dissatisfied communities often results in mining production delays, injury or loss of life, negative press coverage, damaged reputations and, ultimately, lowered share price on global stock markets. In light of this, the mining companies that embrace CSR become a part of doing good business and a feature that mitigates the negative reputation of mining, leads to reduced conflicts with communities and employees, and, ultimately, results in a higher value for the company as part of doing business.

There needs to be broader scrutiny of mining contracts by stakeholders to ensure that their interests are protected. This applies also to the distribution of mineral revenues between local and national governments, there needs to be greater transparency and fairness so that mining communities, which are at the frontline of mining operations, do not entirely lose out. While taxes need to permit a fair return to the investor, which is consistent with the risk profile of the investment, taxes need to be prudently used to maximize the retained value to the national economy through the creation of useful linkages with other sectors of the economy including employment, value added, local purchases, and technology transfer.

Mines are generally located in rural areas with limited or no infrastructure. This substantially escalates project costs and may curtail mine development in some cases. Therefore, infrastructural costs should be shared with other economic activities. This is the approach to the so-called integrated infrastructural development corridors, or spatial development initiatives. The main recommendation is that RECs should, with support from ECA, United Nations agencies and AfDB, and coordination with AUC, establish capacity for resource-based development corridors that optimize the collateral use of mineral infrastructure (transport, power and water) to establish economic activity in other sectors, such as agriculture, forestry and resource processing. Such corridors would assist in overcoming the large mineral infrastructure financing constraints through Private Public Partnerships (PPPs) and the grouping of infrastructure users to maximize economies of scale.

Probably, the most acute of infrastructural problems is cheap and sustainable hydroelectric energy, with most African regions currently in deficit. Currently, the AU/NEPAD African Action Plan (AAP), has more or less, *quid pro quo*, taken over from the NEPAD Short Term Action Plan (STAP), in which AUC, ECA, other United Nations agencies and AfDB are participating, attempts to harness Africa's vast hydro-electric power potential (e.g. Congo River Basin) through various sub-continental projects. Also within the African Action Plan, the Arab Maghreb Union (AMU) regional economic community has a Maghreb Renewable Energy Programme among its priorities, and six renewable energy projects are priorities in the Horn of Africa countries, including geothermal, wind, solar and biogas projects. These projects would harness Africa's large untapped renewable energy potential, especially in areas where other alternatives are costly. While in theory, the AAP identified priority programmes and projects in energy should address the increasing demand from the mining sector, actual progress on the ground is yet to gain critical momentum. A major recommendation therefore is for the continental bodies to speed up implementation of the AAP projects.

Value addition, research and development, technological information: Most African governments desire to create manufacturing value added from their mineral products. However, value creation has eluded more or less the entire continent despite provisions included in policy frameworks for creating value added to mineral products. Policy needs to be backed by legislation, specific incentives and above all institutional capacity to do this. It is recommended that investment is made into appropriate knowledge-creating capacities including, human resources and research infrastructure and innovation systems to support the creation of value. For this purpose, mineral development funds (from mineral revenues) should be established to ensure sustainability through investment into human resource development, R&D and technology development. A good example of this is the Innovation Fund in South Africa. The Innovation Fund is an initiative of the South African Department of Science and Technology, and was launched in 1999. It is mandated to promote technological innovation and business entrepreneurial ventures through investing in late-stage research and development, intellectual property protection and commercialization of novel and innovative South African technologies.

In addition, resources need to be identified to broaden geo-knowledge through greater systematic mapping to fully define Africa's mineral assets. While this is a national responsibility, the AU, RECs, Africa's development and finance institutions and member countries could team up with development partners to prioritize the systematic geological mapping of the continent in order to realize the continent's mineral endowment.

The artisanal and small-scale mining subsector continues to face challenges related to deficiencies in skills, finance, marketing and technology, among others. Ironically, while much is known about best practice in ASM⁷, practical interventions remain woefully short. The key lesson is therefore that progress is not possible unless such best practice convert into practical on-the-ground efforts to step up assistance programmes to bring ASM into the realm of productive, functioning businesses. ASM also needs to be rooted in localized development strategies, within the realm of overall national development goals. Member countries are therefore encouraged to put in place ASM regimes and assistance programmes that facilitate maximization of the contribution of the sector to rural development strategies and poverty alleviation in an environmentally sustainable manner.

Financial, technical and capacity-building support: While donor support is crucial to building up institutional capacities, such support is not sustainable in the long term. This is indeed a recurring lesson in Africa. African governments need to build sustainable internal capacities through both training and retention of professional staff in government ministries. Capacity-building is an area where partnerships provide the most sustainable leverage and can take several forms, including training, exchange of experiences, identification and dissemination of best practices, and creation of an appropriate knowledge base on mineral resource management.

Other than building the management capacities of government departments, a number of areas, highlighted in this summary, require capacity-building interventions from external partners. These include: regional

7 See for example, ECA, A compendium of Best Practice, December 2002.

cooperation for geo-mapping; donor support for resource development corridors, especially in respect of power projects; capacity support for negotiating large mineral infrastructure financing projects; capacities to boost environmental and social management practice; and assistance to small-scale mining ventures to promote sustainable and commercially vibrant mining practices.

5.6 Conclusion

Africa has made improvements in creating a vibrant and a diversified mineral sector. However, these improvements have not been sufficient to secure a sustainable sector that is socially and economically integrated into the long-term development aspirations of its peoples. This review has identified and articulated preconditions necessary for the mining sector to make a telling contribution to the sustainable growth and development of the continent, and to the reduction of poverty as envisaged by the MDGs.

References

Africa Mining Vision

Agenda 21

Campbell, Bonnie (2003). Minerals & Energy, 18 Raw Materials Report

Darimani, Abdulai (2005). Third World Network - Africa Secretariat, Impacts of Activities of Canadian Mining Companies in Africa.

Extractive Industries Transparency Initiative Fact Sheet, 15 May (2009).

Harmonization of Mining Policies, Standards, Legislative and Regulatory Frameworks in Southern Africa.

International Development and Research Centre (2009). Mining in Africa - regulation and development.

ISG (2008). Analysis of the Mining Code of the West African Economic and Monetary Union in the Light of International Trends in Mining Legislation, Review of Africa's Mining Regimes
Minerals Metals and Sustainable Development May 2002, Breaking New Ground.

Johannesburg Declaration on Sustainable Development.

Kaul, Raja; Heuty, Antoine and Norman, Alvina (2008). 2006-2008, A report to the Liberian Reconstruction and Development Committee Office of the President, Republic of Liberia, Getting a Better Deal from the Extractive Sector Concession Negotiation in Liberia.

ECA, (2008). Implementation plan for harmonization of mining policies, standards, legislative and regulatory frameworks in Southern Africa, April.

Johnson, M.S. University Botanic Gardens, Ness, Neston, Wirral, England, CH64 4AY,

P.D. Tanner (2005). Collieries in South Africa: Post- mining rehabilitation, land use and mine closure. Base Metals Division, Anglo American plc.

Review of African Political Economy (ROAP) No.117, 2008.

United Nations Conference on Trade and Development (2005). Globalization of R&D and Developing Countries, UNCTAD/ITE/IIA/2005/6, Geneva.

United Nations Conference on Trade and Development (2008). Handbook on Statistics, Minerals Metals and Sustainable Development, 2001. Worker and Community Health Impacts Related to Mining Operations Internationally.

United Nations Environment Programme (2006). Africa Environment Outlook.

United Nations Industrial Development Organization (2009). Industrial Development Report.

Wise, Holly and Shtylla, Sokol (2007). The Role of the Extractive Sector in Expanding Economic Opportunity. Corporate Social Responsibility Report No 18, Cambridge, MA: Kennedy School of Government, Harvard University.

Web Resources

<http://www.mining-technology.com/features/feature55510/>
www.unep.fr/scp/sp/programmes/index.htm
http://www.treatycouncil.org/new_page_52421111.htm
<http://www.springerlink.com/content/u4828207k321m448>
http://www.oxfamamerica.org/newsandpublications/news_updates/oxfam-america-and-ecowas-to-create-new-mining-code
www.natural-resources.org/minerals/generalforum/minag21.htm
Mineral resources forum UNCTAD
<http://www.icmm.com/our-work/sustainable-development-framework/10-principles>
allafrica.com/stories/200904240458.html
<http://allafrica.com/stories/200906010741.html>
<http://www.kimberleyprocess.com/>
http://www.kimberleyprocess.com/structure/participants_world_map_en.html
http://www.kimberleyprocess.com/structure/participants_world_map_en.html
<http://www.globalpolicy.org/component/content/article/198/40150.html>
http://www.informante.web.na/index2.php?option=com_content&do_pdf=1&id=4081
<http://www.idrc.ca/uploads/user-S/11198920641johnsontanner.pdf>
<http://www.pacweb.org/about-e.php>
<http://www.unep.fr/scp/metals/projects.htm>
http://www.uneca.org/nepad/Projects_Infrastructure.htm
www.unep.org
<http://www.cyanidecode.org/signatorycompanies.php>
www.icmm.org
<http://www.unep.fr/scp/rpanel/>
www.kimberleyprocess.com/download/getfile/820 (Chairs report to the Plenary on the activities of KPCS during 2008)

Transport



6.1 Introduction

Sustainable economic growth and poverty reduction address a complex set of issues that call for the development of all sectors of the economy to meet the needs of the current generation without compromising the long-term needs of future generations. Transport is one of the key sectors that play crucial roles in achieving the goals of poverty eradication and sustainable development. The transport sector is very much linked and influences developments in other sectors of the economy. Indeed, it affects attainment of all eight MDGs.

6.2 Major trends and emerging issues

The following are some of the major trends and emerging issues in the transport sector. Road transport is the most dominant mode of motorized transport in Africa, accounting for 80 per cent of the goods traffic and 90 per cent of the passenger traffic on the continent. African countries together have about 2.06 million km of roads in 2001, resulting in a road density of 6.84 km per 100sq.km. Whereas the average road-to-population ratio for the whole continent is 26 km per 10,000 inhabitants, there is a large subregional variation. Central Africa and Southern Africa have the highest road distribution, with 49.5 km and 56.3 km, respectively, for every 10,000 population. In 2005, only 580,066 km or 22.7 per cent of the total African road network was paved (table 6.1).

Table 6.1: Road network density and distribution in Africa by subregion

Subregion	Road Length (Km)2005	Road Density Km per 100 Km2	Distribution per 10,000 inhabitants
Central Africa	186,471	6.3	49.5
East Africa	527,502	8.4	18.4
North Africa	400,520	4.4	21.0
Southern Africa	728,834	12.3	56.3
West Africa	580,066	11.5	21.5
Africa Total	2,423,393	8.3	26.0

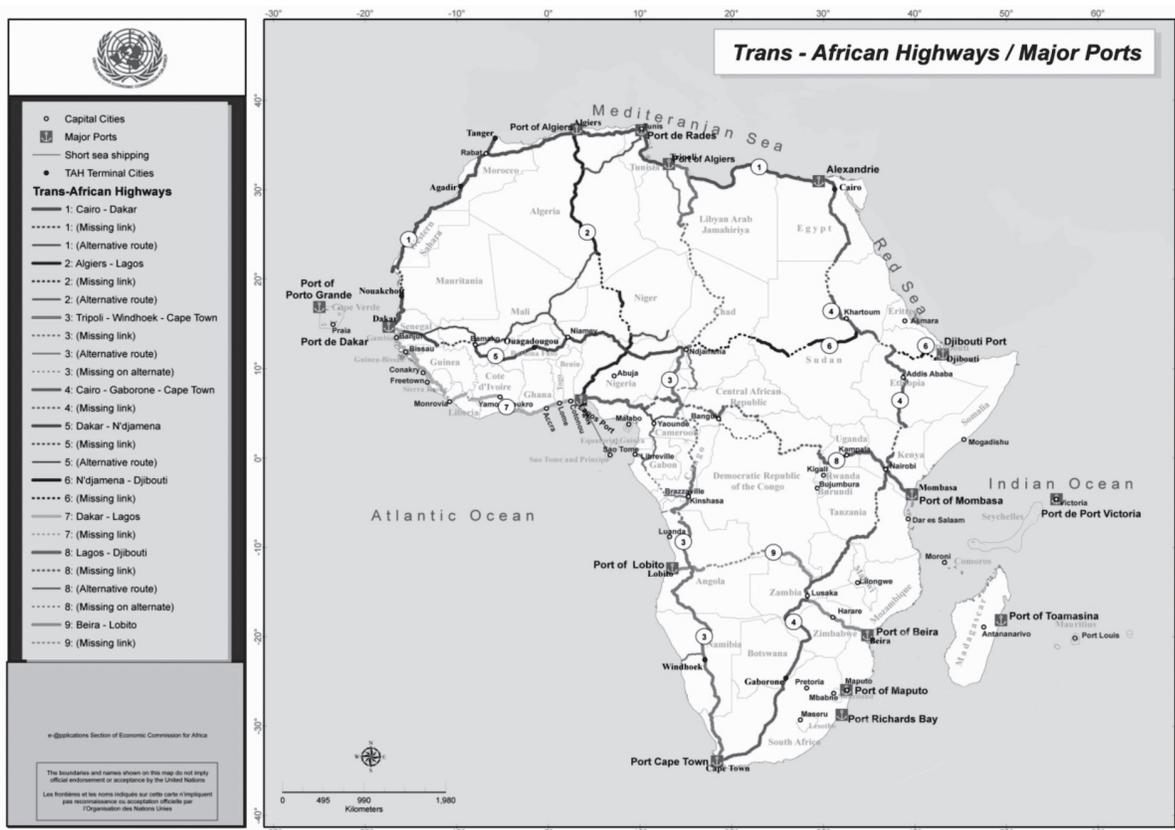
The Trans-African Highway (TAH) programme, launched with the objective of linking Africa's capitals and other commercially important centres of production and consumption, was first included in the UN Transport

and Communication Decade in Africa. The TAH consists of eight major routes: Cairo–Gaborone, Lagos–Mombasa, Dakar–Ndjamena–Djibouti, Algiers–Lagos, Beira–Lobito, Tripoli–Windhoek, Lagos–Nouakchott, Cairo–Dakar. The total length of these highways is 54,962 km, of which 72 per cent is paved and the remaining 28 per cent is classified as secondary or feeder roads.

In light of increased fuel price and need for more safety, most African countries face huge costs associated with transportation. In accessing foreign markets, on average, Africa’s transport and insurance costs represent 30 per cent of the total value of exports, which compares unfavourably with 8.6 per cent for all developing countries. Although most share the problem of high transport costs, landlocked countries face the most excessive transport costs recorded on the continent.

As motorized transport services are lacking in most rural areas of Africa, walking and back/head loading are the predominant means of transport. The relatively well-off rural households use beasts of burden for carrying loads and persons. Most transport activities in Africa’s rural areas involve travelling between adjacent villages on footpaths and tracks, mainly to go to the market, fetch water, collect fuel-wood and visit the health centre. In most cases, access to these services and facilities is difficult as long distances have to be covered on foot, often along unsafe and ragged terrain. What makes the situation even of greater concern is the fact that the burden of transport falls mainly on women.

Figure 6.1: Map of TAH, dotted lines showing missing links



Animal transport, another form of non-motorized transport, comprises the major mode of transportation in rural Africa. This is more prevalent among rural communities where there is a low level of development in infrastructure such as all-season roads. Major animals serving in such mode of transport include donkeys, horses, camel and mules. However, anecdotal evidences reveal that with the steady progress in the development of transport infrastructure in

many African countries, the use of animal transport has reduced, but, the extent of reduction cannot be accurately gauged. This is attributed to the big limitation of access to information in this area.

Road traffic accidents kill 1.2 million people in the world. Of this number, over 225,000, or 19 per cent, were accounted for by deaths on African roads. Moreover, Africa has the highest number of road traffic accidents per capita.

In 2005, the continent had a total railway network of 90,320 km or 3.1 km of per 1,000 km², most of which is disjointed. With the exception of North Africa, railways in Africa generally have a low level of traffic. The railways carry only one per cent of the global railway passenger traffic and two per cent of goods.

Maritime transport is the most dominant mode of transport for moving freight from and to Africa. It accounts for over 92 per cent of Africa's external trade. With a total coastline of 30,725 km, Africa has 90 major ports and a number of other ports providing services for fishing and tourism. African ports handle only 6 per cent of global traffic, of which about 6 ports, three each in Egypt and South Africa, handle about 50 per cent of Africa's container traffic.

In this regard, Africa is also endowed with a number of rivers and lakes that have great potential of being inexpensive, energy-efficient and environment-friendly inland waterways. Twenty-nine African countries have navigable bodies of water, but only a small number have been well developed for transport services.

Despite the potential of these inland waterways for expanding the choice of transport modes, and more importantly, for providing additional access for landlocked countries, very little has been done to develop them. Most of the time even existing waterways are prevented from providing reliable and sustainable service due to a number of problems, including conflicts. The Congo conflict is a typical example of an existing transport operation being disrupted and causing traffic to decline drastically.

The continent had over 4,000 airports and airfields in 2007, of which only 20 per cent had paved runways. Although the number of airports and airfields in the region seem enormous, a significant number of them do not meet International Civil Aviation Organization (ICAO) standards and recommended practices. Only 117 of Africa's airports are classified as international airports. The share of global air transport remains modest at about 5.2 per cent of the passenger traffic, approximately 3.6 per cent of freight and roughly 8.5 per cent of the number of departures for 2006.

According to the NEPAD's study on Transport Infrastructure (2006), out of a total of 1167 aircrafts operated by African airlines, the vast majority (about 80 per cent) were 10 years old or higher, with nearly half of the total (48 per cent) falling in the age group of 20 years or higher (table 6.2).

Table 6.2: Average age of the African air fleet

Age Bracket (years)	0-10	10-20	20-30	Over 30	Total
Number of Aircrafts	236	366	322	243	1167
Share in Percentage	20.2	31.4	27.6	20.8	100

Source: NEPAD Infrastructure Development Gaps Report, 2006.

Transit times on African transport corridors are unduly long due to factors such as unclear and sometimes conflicting rules and regulations, inefficient service providers, road blocks, as well as cumbersome administrative and customs procedures. These have created a serious challenge to transport facilitation and trade on the continent. It leads to excessive traffic delays, resulting in substantial increase in transport costs.

Globally, the transport sector accounts for approximately 25 per cent of world energy demand and for more than 55 per cent of all the oil used each year. The sector depends on petroleum products for 95 per cent of its energy requirements.

Road transport accounts for about 85 per cent of the total energy consumption in the transport sector in developed countries, the balance of the energy consumption in the transport sector being shared by rail, maritime and air transport. The high energy intensity of road transport in Africa can be attributed to aging and inefficient vehicles. Africa's demand for energy will keep on rising with the ever-increasing need for mobility in the efforts to eradicate poverty and achieve sustainable development. This growth will call for increased consumption of energy, mainly petroleum products, or emerging alternatives.

Transport has significant negative impacts on the environment and human health. These impacts are associated with the construction of infrastructure and provision of transport services. Transport is associated with, among other challenges, air pollution, congestion in cities and ports, soil erosion as well as destruction of fauna and flora. Transport accounts for approximately 20 per cent of total world greenhouse emissions. With the rapidly increasing motorized means of transport in Africa, the sector has become the fastest growing source of greenhouse emissions on the continent.

South Africa, a signatory to the UN 1958 Agreement concerning the harmonization of standards pertaining to the construction and use of motor vehicles, has advanced features in controlling emissions from vehicles. As its automotive industry standards are aligned with UN European standards, vehicle emission standards follow those of the UN Economic Commission for Europe. As it is shown in table 2.12, the South African Cities of Cape Town, Durban and Johannesburg had much lower levels of sulfur dioxide concentrations compared to that of Cairo. One major factor for South Africa's low sulfur dioxide pollution is its relatively stringent fuel specifications. In 2004, the specification included maximum sulfur content in unleaded petrol of 500 ppm and in diesel of 3,000 ppm, with a clear plan to reduce these levels progressively (table 6.3).

Table 6.3: Share of CO₂ emission of selected African countries

City	Carbon Dioxide Emissions Per Capita Metric Tons , 2004	Share of Carbon Dioxide (CO ₂) Emission (per cent)
Algeria	6	0.7
Botswana	2.4	0.6
Egypt	2.3	1.2
Morocco	1.4	2.4
South Africa	9.4	90.6
Zimbabwe	0.8	3.5

Source: World Development Indicators, 2008.

The destruction of forests and other ecosystems including wildlife habitats, land degradation particularly through soil erosion on land adjacent to infrastructure, and changes made in drainage systems and geological formations associated with the construction of roads, railways, airports and seaports are major environmental concerns in the transport sector.

Although health problems resulting from air pollution in Africa are still low by the standards of other developing and developed countries, these problems are increasingly a source of concern. The cost of air pollution in a number of African cities can be as high as 2.7 per cent of GDP. Carbon monoxide, for example, can cause acute and chronic effect on humans at various concentrations which may be manifested as headache, dizziness, vision and hearing impairment, asphyxia, cerebral congestion, edema and death. Similarly, SO₂ levels exceeding the WHO guideline of 350 µg/m³ affect human health in a number of ways. Some of the effects of

exposure to SO₂ include irritation, reduced lung function, impaired vision and increased respiratory diseases. SO₂ and NO_x interact in the atmosphere to form fine sulphate and nitrate particles that can be transported long distances by winds and inhaled deep into people's lungs. Many scientific studies link elevated levels of these fine particles to increased illnesses and premature death from heart and lung disorders such as asthma and bronchitis.

In order to achieve its goals of poverty reduction and sustainable development, Africa needs to invest about \$40 billion annually in building new infrastructure and another \$40 billion for maintenance and operation of existing infrastructure.

The number of people living with HIV/AIDS worldwide has increased from 32.9 million in 2001 to 39.5 million in 2006. The number of people dying from AIDS has also increased from 2.2 million in 2001 to 2.9 million in 2006, prevention methods being unable to keep pace with the growth of the epidemic. The road transport sub-sector is known to have played a significant role in the spread of HIV in Africa. Various studies (Riverson, *et al*) have shown that transport sector workers such as long-distance drivers and seamen have contributed to the spread of HIV/AIDS along road corridors and ports. The situation along transport corridors is aggravated by the delay at check points where drivers are sometimes forced to stay around the check points over night or even longer.

Africa's poor transport infrastructure, high fuel prices, aging and inefficient fleet, poor transport facilitation as well as limited competition and low level of trade volumes on some routes are the main factors that explain the high transport costs in Africa.

According to a study⁸ conducted by the World Bank with a view to identifying the determinants of high transport prices that users of transport services face in sub-Saharan Africa, in Central and West Africa, road freight transport is dominated by cartels⁹ charging high prices for low quality services. In Eastern Africa, the trucking industry is deregulated and hence more competitive than in West Africa. Northern and Southern Africa have better opportunities to balance the supply with the demand for transport services and hence can bring down their unit costs to comparable levels with Asian countries. Of all the subregions of Africa, the Southern Africa transport corridor is the most advanced in terms of efficiency, competitive prices and service quality.

Safety and security are important concerns of the region that should be taken into account throughout the life cycle of any system. Because of its dynamic nature and geographic spread, the transport system is exposed to potential risk of accidents and breach of security more than any other single economic sector. In the transport sector, accidents can occur, among others, during construction of infrastructure, manufacturing of equipment as well as operation. A brief outline of the major safety and security issues in the transport sector are given in the following paragraphs.

Having recognized the importance of using ICT in all aspects of management, including, in maintaining a database in relation to transport infrastructure and operations, traffic management, tracking and virtual follow-up of freight, flight booking, etc., some African countries have significantly developed their transport database and ICT capabilities. Despite the progress in the development of transport information systems in a few countries of the continent, many African countries have not yet taken full advantage of the new technologies mainly due to financing constraints and lack of adequately qualified staff.

In recent years, African governments have allocated 6-8 per cent of their GDP annually to infrastructure development. This amounts to \$16-20 billion, which is a significant improvement in annual government

⁸ Teravaninthorn, S. and Raballand, G., 2009.

⁹ A cartel is a consortium of independent organizations or companies formed to limit competition and set monopoly prices by controlling the production and distribution of a product or service.

allocation compared to the \$8-8.5 billion allocated to infrastructure in the 1990s. It is, however, clear from the above that government allocation for infrastructure falls far short of the requirement. The investment requirements for new transport infrastructure and maintenance in Africa are conservatively estimated to be \$14.2 billion annually. The 2007 financing requirements for transport infrastructure for 13 sub-Saharan African countries alone was estimated to be \$6.4 billion.

Box 6.1: Urban transport in Cairo

In Egypt, the number of vehicles increased from 3.6 million in 1992 to 6.6 million in 2005. Of these, about 50 per cent of the total number of vehicles in the country was registered in the Cairo Metropolitan Area.

The capital city, Cairo, with a population of 12.1 million in 2008 is served by different modes of transport. The formal public transport service, consisting of the State-owned Cairo Transit Authority (CTA), the Greater Cairo Bus Company (GCBC) and the Cairo Metro Organization, which runs the urban heavy-rail service, is the dominant form of urban transport in Cairo.

The informal service is dominated by the privately owned shared taxis, with typical capacities of 11-14 seats. Given their average age of over 12 years old and running on old-generation diesel engines, most buses and trucks in Egypt consume significantly more fuel than is required by new and more energy efficient vehicles of the same capacity.

Of the total number of daily trips of 18 million made by motorized transport in Cairo, 68 per cent was made by public transport. The total number of passenger trips made by public transport is nearly evenly divided between the formal and informal mode of transport. Crowding of public transport in Cairo is common, sometimes reaching intolerable levels (Thompson and Nagayama, 2005). This is to be expected, as the number of buses has increased by only 19 per cent from 3,700 during the past decade, whereas the network has expanded by 66 per cent from 6,100 km.

As part of the effort to improve urban transport, Egypt has built the Cairo Underground Metro and made it operational since 2000. The Metro, the first of its kind in Africa and the Middle East, carries an average of 2.7 million passengers a day.

6.3 Implementation progress and achievements

African countries have taken a number of concrete actions and made some progress towards implementation of transport-related commitments and goals contained in A21, PFIA21, JPOI and other sectoral declarations. Some of the measures taken and under implementation are highlighted below.

Transport policies, strategies and programmes: Subregional, regional and international entities as well as ministerial conferences and Heads of State Summits have adopted resolutions with the view to accelerating development of an integrated transport system in Africa. In recognition of the important role of transport infrastructure and services in meeting the MDGs, the meeting of African Ministers responsible for Transport and Infrastructure held in Addis Ababa, Ethiopia, on 6 April 2005 adopted a declaration setting a number of targets for 2015.

These targets included: reducing the proportion of rural population living beyond 2 km of an all-season mode of transport by half, in order to improve access to inputs and markets and generation of employment opportunities; narrowing down the difference in average transport cost within Africa by 50 per cent as compared to Asia; reducing the rate of accident fatalities arising from road and other means of transport by half; reducing the number of urban and rural residents for whom mobility problems severely constrain access to employment and essential services by half; promoting environmental sustainability in all transport

operations and development programmes; phasing out production and use of leaded petrol; and dismantling all physical and non-physical transport barriers.

A number of programmes have been developed to improve transport in Africa. These include the United Nations Transport and Communications Decade in Africa (UNTACDA-I), which was launched in 1978. The second decade programme, UNTACDA-II was launched in 1991 with the long-term objective of establishing an efficient and integrated transport and communications system as the basis for the physical integration of Africa. Out of the 708 projects approved, 466 projects had been fully or partly implemented by 2000. The level of resources mobilized for the projects was \$9.0 billion, compared to the financing requirement of \$16.6 billion, indicating 54 per cent achievement. In addition to the infrastructure projects, UNTACDA-II incorporated four special initiatives: human resources and institutional development, the Yamoussoukro Declaration on a New African Air Transport Policy, the regional transport database and the Trans-African Highway Bureau.

Satisfactory results have been achieved as a result of the implementation of UNCTADA II. These results include expansion of the transport network, improvement of quality of infrastructure and services and strengthening of institutional capacity.

The Programme for Infrastructure Development in Africa (PIDA), jointly initiated by AUC, AfDB and NEPAD Secretariat, is underway. It aims at ensuring integrated development of Africa's infrastructure, avoiding duplication of efforts, establishing a strategic framework for the development of subregional and regional infrastructure, and developing an infrastructure investment programme with a clear and viable implementation strategy. PIDA is currently at its initial stage.

The Sub-Saharan Africa Transport Policy Programme (SSATP) Poverty Reduction and Transport Strategy Review (PRTSR) underway in many countries is helping to integrate transport planning within poverty reduction strategies, and has the potential to serve as a tool for policy development in all aspects of the transport sector. Eighteen member countries of the SSATP, including Burkina Faso, Central African Republic, Ethiopia and the Gambia that were added in 2007, had completed their PRTS reviews and started work on implementing the recommendations of the reviews by the end of 2007. In Cape Verde, Burundi and the Niger reviews were also underway in 2007.

In Central Africa, DRC, Mali, Malawi, Rwanda and Senegal, the review proposals shaped the way transport was perceived as part of poverty reduction strategies. In other countries, the sensitization process initiated the demand for updating transport strategies in response to the changing development environment that currently feature the MDG objectives. DRC, Ethiopia, Lesotho, Malawi, Mali and Zimbabwe completed preparation of their transport sector policy documents and master and investment plans by 2007, while Benin, Burkina Faso, Cameroon, Central Africa, the Niger, Senegal, Tanzania and Uganda, started to draft their policy documents in the same year.

In the railways subsector, the Brazzaville Declaration and Plan of Action on African Railways adopted by the first meeting of the African Ministers responsible for railway transport that was held in Brazzaville in 2006, reaffirmed the commitment of African governments to develop an effective railway system that would promote Africa's development and integration. A follow-up conference organized by AUC in collaboration with the Republic of South Africa for railway professionals looked into issues such as interconnection and interoperability of continental railway networks and made recommendations on harmonization of standards for infrastructure, equipment, practices and procedures.

With regard to Africa's maritime transport, the first AU Conference of Ministers responsible for Maritime Transport held its meeting in Abuja, Nigeria, in February 2007 on the theme "The role of maritime transport in the development of Africa." The meeting adopted the "Abuja Declaration for effective revitalization of

maritime transport in Africa”, as a key component of an African socio-economic development policy and the associated Plan of Action on Maritime Transport for Africa.

Measures have been taken to liberalize air transport in the region. These include actions taken by African countries to implement the Yamoussoukro Declaration and subsequent decisions of African governments, with the objective of promoting cooperation and solidarity in protecting and developing international air transport services in Africa. Member States of the Central African Economic and Monetary Community (CEMAC), six countries in East Africa and eight in Western Africa have complied with the Yamoussoukro Decision. Other African countries have not yet fully complied with the Decision.

Human and institutional capacity-building is being undertaken with the support of development partners. Through SSATP, countries have established and are restructuring road agencies, and are enhancing the capacity of local governments to coordinate rural transport infrastructure and services effectively. Other capacity-building initiatives are also underway as part of the cooperation agreements with AfDB, ECA, EU, Infrastructure Consortium for Africa (ICA), World Bank and bilateral donors.

Improving rural transport: SSATP analytical work to provide methodologies for the assessment of rural transport services was carried out in the 2004-2007 period. At the same time, a review was carried out of the progress made in terms of promoting intermediate means of transport (IMT) and evaluation of the success and bottlenecks of the Rural Travel and Transport Programmes (RTTP) that have been implemented by many African countries, supported by the World Bank and bilateral donors. The findings revealed the poor state of motorized rural transport services, and the absence of regulatory frameworks and institutional structures. They indicated the need to address the regulatory, institutional and financing aspects of rural transport that restrict the provision of affordable transport to the poor. To address the issue of the knowledge gap, training material on the management of rural transport was developed and the first training of its kind was conducted in 2007.

Some SSA countries such as Ethiopia, Malawi and Nigeria have taken the principles of RTTP further by launching large scale rural access improvement programmes linked to rural development. Nigeria, for example, has integrated its rural travel and transport programme with its National Transport Policy. Following the development of its draft rural travel and transport policy in line with the RTTP framework of SSATP, Nigeria is currently implementing a major Rural Access and Mobility Project (RAMP). RAMP was funded by the Federal Government of Nigeria, in collaboration with state governments and development partners such as the World Bank and AfDB.

Transport facilitation, safety and security: A number of international and bilateral agreements and protocols aimed at simplifying and harmonizing trade and transport between States have been signed in Africa. In Central, East, Southern and West Africa, inter-state conventions and protocols have been adopted, many of which are being implemented. These include: transportation of miscellaneous goods by road; multi-modal transport; regulation of transport of dangerous goods, highway and civil aviation codes; maritime cooperation; common vehicle insurance schemes, joint border posts as well as transport corridor management mechanisms.

As part of the initiative of the United Nations Secretary-General to refocus attention on timely achievement of the MDGs, the United Nations has established the MDG Africa Working Group, including the Infrastructure and Trade Facilitation Thematic Working Group, which is supported by AfDB, the European Commission (EC), World Bank and the ICA Secretariat.

The Almaty Programme of Action initiated by UNGA in 2003, for example, was launched to address transit transport and trade issues by developing efficient transit systems for landlocked developing and transit countries. As a follow-up to this international initiative, African Governments have developed the African Programme

of Action focusing on development of the major transit corridors that were selected at a preparatory meeting on the Almaty Programme of Action in 2003, in Addis Ababa.

Transport safety and security is an area of serious concern in Africa. Having recognized the significant health hazard and economic cost of poor road safety, African governments are working with the SSATP to formulate and implement sound transport policies that will, among other goals, improve road safety. The African Road Safety Congress jointly organized by the Government of Ghana, the World Health Organization (WHO) and ECA was held in Accra, Ghana, 5–8 February 2007. It reviewed the progress made by African countries in improving road safety and in developing national action plans.

The Conference adopted the Accra Declaration, which called upon developed countries to recognize the urgent need to improve road safety in Africa and systematically include road safety in their cooperation programmes. The Declaration also highlighted the commitment of the African governments represented at the Conference, inter alia, to work together to stop the growing epidemic of deaths and injuries on African roads.

In the water transport subsector, a number of measures have been taken to address the important issues of safety and security. With regard to inland water transport, the International Maritime Organization (IMO) has developed a model safety regulation for inland waterway vessels and non-conventional craft, including fishing vessels operating in Africa.

To combat the increasing threat of maritime piracy in the Horn of Africa and the Gulf of Aden, many governments are taking steps in cooperation with IMO. The United Nations Security Council recently authorized the naval powers of the world to conduct patrols off Somalia. Since then warships including those from the North Atlantic Treaty Organization (NATO), EU, India and Russia have been patrolling the sea off the coast of Somalia and in the Gulf of Aden.

A code of conduct aimed at combating acts of piracy and armed robbery against ships was also adopted following a high-level meeting held in Djibouti on 26 January 2009 under the auspices of the IMO and attended by representatives of 17 States from across the western Indian Ocean, Gulf of Aden and Red Sea areas. The code requires signatories to share and report relevant information, interdict ships suspected of engaging in acts of piracy or armed robbery, apprehend and prosecute persons committing or attempting to commit acts of piracy and armed robbery as well as facilitate proper care, treatment and repatriation for seafarers, and other shipboard personnel and passengers subject to acts of piracy or armed robbery.

To enhance air transport safety, ICAO has embarked on the Universal Safety Oversight Audit Programme (USOAP). The lessons learnt from the ICAO safety audits have led to the commitment by the Directors of Civil Aviation to implement an action plan aimed at strengthening their capabilities with respect to safety oversight, particularly with regard to the areas of licensing, airworthiness and the operation of aircraft. The Second Conference of African Ministers responsible for air transport held in Libreville, Gabon in May 2006 reviewed the progress made in USOAP implementation.

Energy efficiency and environment sustainability in the transport sector: In order to ensure more energy-efficient mass transit systems, Bus Rapid Transit (BRT) was recently added to Africa's transport system. The BRT simulates a mass transit system using exclusive right of way lanes in line with the metro systems well known in developed countries, but using bus technology instead of rail. In recent years, Cairo, Lagos, Johannesburg, Dar es Salaam, Dakar and Kampala have either introduced the BRT or are preparing to do so. Given the rising concern regarding the impact of emissions on the environment from motorized modes of transport, initiatives are also underway to address sustainable transport in Africa by promoting non-motorized transport, among other strategies.

An example of such an initiative is one carried out by the Institute for Transportation and Development Policy (ITDP) under the programme called *Access Africa* and it is being carried out in Ghana, Senegal, South Africa and Tanzania. It aims at promoting healthy and environment- friendly cities by making sure that the mode of transport meets the needs of the people and is energy-efficient. Some elements of the ITDP efforts, as part of implementing the *Access Africa* programme include the California Bike Coalition, which aims at improving the quality of bicycles available in SSA through a unique partnership with the international bicycle industry.

Box 6.2: Jatropha Project in Ghana and Mali

In Ghana, a small local community of Jatropha project worked with women's groups to produce cosmetics and small amounts of fuel for milling engines. This was replicated by another project on a larger scale in a different region of the country, with emphasis on bio-fuel production at scales more relevant to the transport sector. Partnerships with relevant government agencies were created from the beginning of the projects. The combination of these projects, plus the networking efforts of some project proponents, led to the creation of a national bio-fuel policy committee, charged with making recommendations for mainstreaming bio-fuel in the Ghanaian transport sector.

In Mali, the grantee has been working with communities to establish Jatropha plantations and markets for several years now, and the featured project itself replicated previous projects, with the additional focus on supply chains for motor vehicles. Through the participatory project design, a village focal point has been established in each village to diffuse acquired Jatropha knowledge to neighbouring people thus setting up an informal institution for replication. The private sector is playing a great role in the process by commercializing components of the supply chain.

Access Africa has a component to improve safety for bicyclists and pedestrians, by promoting safe space for all modes of transportation. ITDP is working with officials in each country to provide safer and more attractive routes for bicyclists and pedestrians.

As part of the Clean Air Initiative, African countries adopted the Dakar Declaration of 2001 in which they expressed commitment to phase out leaded gasoline in their respective countries by December 2005. Accordingly, nearly all African countries have met their commitments. Virtually all of SSA countries phased out leaded gasoline effective 1 January 2006. By the end of 2008, only two African countries (Algeria and Tunisia) had not phased out leaded gasoline, having set early 2009 as their target for marketing lead-free gasoline in their respective countries.

African countries have also embarked on initiatives to reduce the level of sulphur in the motor fuels to the globally recommended level. For instance, South Africa, whose sulphur dioxide concentration in its largest cities is already lower than that of Cairo, has planned to reduce the maximum sulphur content in petrol from its level of 500 ppm in 2004 to 50 ppm in 2010, with a similar target of 50 ppm of sulphur in diesel from its level of 3,000 ppm in 2004.

With regard to the development of cleaner fuels, demonstration projects in a number of countries have shown the advantages of bio-fuels as a cleaner energy source compared to the traditional fossil fuels. In this regard, biodiesel projects involving the planting of Jatropha trees for biodiesel production have been undertaken in Ghana, Mali, Mozambique and Tanzania in 2004 and 2005. Although the projects were initially intended to provide biodiesel for use as household fuel, the eventual aim is scaling up for supplying fuel for transport.

In recognition of Africa's minimal role in global carbon emissions, the 12th Session of the Heads of State and Government of AU held in Addis Ababa in January 2009 reiterated the need for those countries that have contributed the most to global warming to compensate Africa for the damage done to its economy in line with the 'polluter pays' principle.

Many countries in Africa have put legislation in place for protection of the environment. An important provision of these laws is a requirement for project sponsors/developers to undertake environmental impact assessments (EIA) for proposed projects before they are implemented. In addition to the national environmental laws, a number of these countries including Egypt, Ethiopia, Nigeria, South Africa, Tanzania and Uganda have also developed supporting regulations and sectoral guidelines for implementation of these policies and laws.

Other measures taken to address potential environmental impacts of transport include amendment of legal provisions in the importation of vehicles. For example, new cars imported into Benin, Cape Verde, Kenya, Mauritius and Tanzania are required to be fitted with catalytic converters. Import of second-hand cars is another area where some countries have either implemented or are planning to implement regulations limiting the age of imported vehicles or levying heavy taxes on older vehicles. Eritrea, Mauritius and Tanzania fall in this category.

In addition to controlling imports of old vehicles and setting the requirement of fitting anti-pollution devices in new vehicles, Kenya's National Environmental Management Agency is working together with the Kenya Bureau of Standards to put standards in place for emissions from vehicles. In Morocco, the Emissions Monitoring and Reduction project named *Amelioration of Air Quality and Reduction of Air Pollution from Vehicles* was undertaken to support implementation of a government decree against air pollution. The project involved the testing of a total of 100,000 vehicles in a number of cities in Morocco, for levels of emission.

Health: Africa's transport corridor development programmes have incorporated mechanisms to address the HIV/AIDS epidemic and, more specifically, prevent the transport sector from continuing to be a vehicle for the spread of the virus. The project undertaken, with support from the World Bank, is to study the correlation between transit transport movements and HIV/AIDS on the Abidjan-Lagos Corridor (ALCO). The project covers four countries of West Africa (Benin, Cote d'Ivoire, Ghana and Nigeria). The findings of the study showed that the cumbersome border-crossing procedures resulting in delays at the borders have created demand for overnight lodgings thus attracting commercial sex workers to such places. This in turn has exposed drivers, passengers and traders to the risk of HIV/AIDS.

As part of the regional effort to minimize the role that the transport system plays as a vehicle for transmission of HIV/AIDS, the SSATP programme has included a component to address HIV/AIDS problems in Africa. Under this component, the following have been accomplished: HIV/AIDS policies have been developed in 10 countries; HIV/AIDS transport strategy has been developed with support from the International Labour Organization (ILO); and the Poverty Reduction Transport Strategy (PRTSR) reviews have included actions and recommendations to limit the spread of HIV/AIDS.

Investments, funding and technical support in the transport sector: African countries have established Road Funds to help mobilize additional resources for financing the transport sector. By 2007, twenty-seven countries in the region had established Road Funds with the aim of providing a predictable and sustainable source of finance for road maintenance. The establishment of Road Funds was one of the important results of the Road Management and Financing initiative launched under the SSATP.

Developed countries have provided financial and technical support to African countries to help develop the transport sector. ICA, financed by the G-8 Group and other bilateral donors, has committed an increasing volume of financing for Africa's transport projects during the past few years. Financing commitments from ICA sources increased from about \$2.6 billion in 2005 to nearly \$3.6 billion in 2007. The bulk of the financing from ICA sources for the transport sector is provided by EU, World Bank and AfDB, with EU contributing the highest share. There is also an encouraging development in the composition of donors, with the addition of non-OECD members, such as Arab countries, China and India.

Table 6.4: Main sources of ODA for transport in Africa (\$US million)

Donor/Sector	2006	2007
AfDB	656.4	611.1
EU	897.8	1024.1
IDA/WB	670.2	922.5
EU Members	133.3	176.3
Japan	311.3	349.9
USA	498.9	258.3
Others (IFC & AfDB Private)	-	252.5
All Donors	3167.9	3594.7

Source: ICA Annual Reports 2006 and 2007.

In an effort to eliminate the missing links of Africa's road network, priority roads have been identified to be built by mobilizing resources from domestic and external sources. The regional road projects being financed by AfDB are shown in table 6.5. The roads, with a total length of 13,780 km include all the missing links representing about 25 per cent of the total Trans-African regional road network.

Table 6.5: Priority road projects being financed by African Development Bank

Rec	Corridor	Country Coverage	Length (KM)	Est. Dev. Cost (USD, mn)
COMESA	Nairobi-Cairo	Kenya-Ethiopia-Sudan-Egypt	900	500
	Dodoma-Kigali	Tanzania-Burundi-Rwanda	500	400
	Lobito-Beira	Angola-Zambia-Zimbabwe-Mozambique-DRC	1770	950
SADC	North-South	South Africa-Botswana-Zambia	150	100
	Trans-Kunene	Namibia-Angola	980	400
	Nacala	Mozambique-Malawi-Zambia	890	450
	Mtawara	Mozambique-Tanzania	810	450
CEMAC ECCAS	Pointe Noire-Ndjamena	Congo-DRC-CAR-Chad	0	550
	Yaounde-Bangui-Kisangani- Bujumbura	Cameroon-CAR-DRC-Burundi	4000	2000
	Yaounde-Brazza-Luanda	Cameroon-Gabon-Congo- DRC-Angola	1000	550
ECOWAS	Dakar-Lagos	Senegal-Gambia-Guinea-Guinea Bissau-Sierra Leone-Cote d'Ivoire-Togo-Benin-Nigeria	2150	900
	Algiers-Lagos	Niger	400	200
	Dakar-Ndjamena	Senegal-Mali-Burkina Faso-Niger-Nigeria-Chad	230	150
GRAND TOTAL			13,780	11,400

Source: ICA Annual Report 2006 Volume II.

Africa's private sector participation in transport investment had lagged far behind other infrastructure sectors until 2005. It had an average share of 11 per cent, limited to port and railway concessioning in a few countries. In 2006, the share of private sector investment in transport improved to 21 per cent compared to private sector investment in all infrastructure (Energy, ICT, Transport and Water) sectors.

6.5 Implementation challenges and constraints

In spite of the efforts made by African governments and their development partners in formulating and implementing measures, policies, strategies and programmes to develop an adequate, safe, secure and affordable transport system that supports efforts to eradicate poverty and bring about sustainable development, a wide gap still exists between planned targets and the level of achievement. This can be attributed to the numerous challenges and constraints that the region faces in relation to the development of sustainable transport systems. The major challenges and constraints include the following.

Inappropriate national policies and limited implementation of national, subregional and regional agreements: The lack of appropriate and well-formulated policies and strategies as well as the slow implementation of subregional and regional agreements remain major obstacles to the development of sustainable transport in Africa. Many African countries do not have policies that allow and promote private sector participation in transport infrastructure development and operation. Liberalization and privatization in rail, air and maritime transport are still in their infancy. Efforts to harmonize policies and regulations pertaining to cross-border movement of goods, services and people have not yet been effective, as many African countries have not fully implemented agreements aimed at facilitating cross-border movement of goods and passengers by road and rail, or the much anticipated and long overdue Yamoussoukro Decision in relation to air transport.

Low transport network connectivity and poor state of network: In many African countries, transport networks are characterized by several missing links within each country and between countries, forcing a significant percentage of the rural population to live without access to market and essential economic and social services. Coupled with the problem associated with the missing links in the road, rail, inland waterway and air transport system, a large proportion of the existing infrastructure is aging and in a poor state.

Inadequate human and institutional capacity: Although the number of workers in African public transport enterprises and agencies is relatively high, the availability of skilled personnel is limited in most transport organizations. In addition to lack of adequate skilled human resources, institutions are also lacking, that have appropriate powers and technical capacity to formulate, plan, and manage infrastructure development and services and to regulate and enforce policies and regulations.

Negative impact of transport on the environment: Despite the critical importance of the transport system in economic development and poverty reduction, it is also associated with significant adverse effects on the environment. The most serious environmental concerns usually associated with the construction of roads, railways, airports and seaports are the destruction of forests and other ecosystems including: wildlife habitats; land degradation particularly through soil erosion on land adjacent to the infrastructure; and changes made to drainage systems and geological formations.

High transport costs: Africa has the highest transport costs in the world. Transport services are unaffordable to many African citizens as transport costs are high compared to the average incomes of the citizens. Travel costs in African cities have a share of 21.7 per cent of GDP. Freight costs in Africa are significantly higher than the average cost in Asia. The already high transport costs have been exacerbated in the last few years by the energy crisis associated with high and volatile oil prices. Factors such as the limited skills of managerial and operational staff and poor transport facilitation play significant roles in the high transport costs in Africa.

Poor transport safety and security: The prevailing poor state of road safety remains a serious challenge in Africa, as accidents and the resulting loss of life and destruction of property has assumed intolerable proportions. A major weakness in this area is the absence in some countries and the weakness in other countries of lead institutions that are responsible for road safety. Coupled with this, there appears to be a lack of consistent enforcement of traffic regulations. In most cases, the major constraint common to all the weaknesses in the

management of road safety is the lack of adequate financial resources. The poor safety record of many African airlines is another area of major concern in Africa.

Poorly developed transport information systems: Statistical information is a key input at every stage of the development process, including in the planning and implementation of programmes and projects. Adequate and well-organized statistical information provides tools for making informed decisions in identifying gaps, formulating policies and strategies, developing effective investment programmes and for monitoring and evaluation. However, in Africa, such data availability is at best limited and poorly organized. Likewise, despite the importance of ICT in facilitating decision-making through rapid data processing, storing, retrieving, transferring over long distances, the transport sector has not taken full advantage of the technology due mainly to lack of a proper policy for ICT development and limited financial and human capacity.

Limited financial resources: Despite efforts by African governments and their international and domestic development partners to mobilize financial resources for investment in transport infrastructure and maintenance of existing facilities, huge gaps remain between the demand and available resources. Sustainable transport development requires huge financial outlays to build infrastructure, and provide energy-efficient and environment-friendly transport equipment, among others.

6.5 Lessons learned and recommended priority policy measures and actions

Transport infrastructure and services are critical to Africa's sustainable development. Effective mobility and timely access to goods and services require well-developed, safe, secure and affordable transport network and services. However, Africa's transport system has not yet been developed even to the level of other developing countries in Asia and the rest of the world.

Lessons learnt from ongoing initiatives have shown that the potential for speeding up implementation of commitments and achievement of goals and targets exists. This, however, requires the right set of measures to be undertaken in the area of policy, strategy, resource mobilization and capacity-building. The biggest challenge remains the translation of policies and strategies to concrete action in a timely manner. To address this aspect requires provision in a timely manner of financial and other resources, and strengthening and achieving good corporate and public governance. More specific lessons learnt and recommended policy and other measures necessary are presented under each of the major interventions below.

National policies and subregional and regional agreements: African countries have to prove their commitment to improving the domestic investment environment by taking practical actions in the following areas: fully liberalizing the transport sector to attract private sector financing; strengthening the regulatory and enforcement mechanisms in order to create level playing fields for infrastructure investment and services; and improve coordination in the development and implementation of regional and subregional agreements on transport facilitation and air transport liberalization.

Human and institutional capacity-building: Efficient institutions having appropriate mandates and staffed with highly motivated and skilled human resources are key elements in the development of a safe, secure, affordable and environmentally sound transport system.

To enhance the environment for improving and expanding transport infrastructure and services, the measures that need to be taken in the area of capacity-building include to: ensure that appropriate institutional frameworks are put in place and separate regulatory and operational functions for all modes of transport;

strengthen existing and establish new entities responsible for the planning, regulating and implementing activities that will support the development of sustainable transport; strengthen and expand national and regional institutes and centres of learning and specialized training; eliminate physical and non-physical barriers to the movement of goods and passengers at ports, border crossings and inland terminals, including cumbersome clearance procedures and road checks along the corridors serving landlocked countries, among other reasons, to prevent transport sector workers from being exposed to HIV/AIDS; develop and implement capacity-building programmes to upgrade the knowledge and skills of staff involved in policy formulation, planning and implementation as well as those engaged in regulatory and enforcement functions; and raise public awareness and participation of key stakeholders in all phases of policymaking and implementation.

Transport and the environment: The development of sustainable transport which adequately meets the mobility and access needs of African countries and, at the same time, reduces greenhouse emissions has been demonstrated, albeit in a limited way, to be possible in Africa.

Africa, although not by design, is a good example of the advantages of low motorized transport from the environment point of view. Because of its low motorized modes of transport compared to other regions of the world, Africa's contribution to global greenhouse gas emissions and the associated climate-change impacts, air pollution, land usage for transport infrastructure, as well as impact on fauna and flora is low.

Although the continent is not currently among the big polluters, if the continent continues along the path of business-as-usual, it will not only retard its own development but also significantly contribute to the global problem of climate change. Africa should draw lessons from the other countries which have significantly contributed to global warming by avoiding the path they followed to develop their fossil fuel-dependent transport system. Given the embryonic stage of the transport system in Africa, the continent has a unique opportunity to develop low carbon and environmentally sound transport systems.

Apart from mitigation measures based on thorough EIAs that should be incorporated into infrastructure development plans, the following measures need to be taken to minimize carbon emissions and avoid environmental degradation: ensuring that projects pass through rigorous EIA processes before approval; establishing appropriate incentives to encourage the development and use of more efficient and cleaner modes of transport, including use of energy-efficient modern vehicles, locomotives, vessels and aircrafts; promoting the use of low-energy consuming passenger and freight transport systems; removing obstacles and disincentives to the development of cleaner energy sources; developing properly planned infrastructure and upgrading existing ones to acceptable standards; improving traffic management to reduce congestion and delays and their associated emissions; strengthening measures to minimize the number of vehicles in operation, particularly aging fleets, and other transport equipment with high emissions; and integrating transport infrastructure planning into land use planning to ensure sustainable transport, which meets accessibility, mobility and environment needs and requirements.

Other measures required include: involving all stakeholders, including local authorities, ministries, airport authorities and representatives of residents in the neighbourhoods of prospective airport locations to have their say about land use and airport planning; taking into account the ICAO work on aviation and environmental protection when developing air transport and environmental policy; ensuring that wastes arising during the construction of transport infrastructure and operations, including oil spills and scraps are kept to the minimum; and encouraging reduction of travel through such mechanisms as the use of tele-conferencing and other electronic modes of message transfer as a substitution for air travel or driving to meetings, conferences, and so on.

Energy efficiency and transport cost: Transport services in Africa are associated with high costs, attributable to a complex set of factors, including inadequate and poor infrastructure, aging and inefficient fleets, poor transport facilitation as well as limited competition and low traffic on some routes.

Lessons learned show that availability of goods and services in close proximity to consumers minimizes the need for movement of passengers over long distances. Land use planning can make an important contribution in this regard by, for example, limiting urban sprawl, which is associated with the formation of a settlement pattern calling for the less energy-efficient transport modes, such as the proliferation of taxis and private vehicles.

In order to improve on energy efficiency and reduce costs in the transport sector, the following actions need to be undertaken: integrating transport planning with land use patterns with the view to minimizing transport demand; encouraging the development of more energy-efficient mass transit systems; developing and utilizing energy-efficient modes and means of transport; and improving the management of enterprises by upgrading the capacity of managerial and technical staff as well as streamlining operations and administrative functions;

Institutional reforms, including liberalization and privatization should also be carried. There is also need to improve and properly maintain infrastructure, transport machinery and equipment; ensure full implementation of transport facilitation initiatives; and promote intra-modal and inter-modal transport competition to improve efficiency.

Transport safety and security: The loss of human life and property caused by traffic accidents has assumed alarming proportions in all modes of transport in Africa, but more so in road transport. The Road Safety Initiative underway in Africa under the auspices of SSATP has contributed to improving awareness of the impact of road accidents on human life and the economy. African countries need to build on such initiatives to improve safety in all modes of transport by taking the following measures: establishing effective institutional framework and strengthening existing ones to manage traffic and ensure safety; allocating adequate funds for safety programmes in line with the call made by the Commission for Global Road Safety for the allocation of at least 10 per cent of the total road infrastructure investment for safety related activities; ensuring compliance with safety and security regulations and standards established by the relevant international and regional bodies in all modes of transport; and addressing maritime security problems, particularly in relation to escalation of maritime piracy in recent years, in a holistic manner, including through an in-depth look at the root causes of piracy.

As a short-term measure to combat the recent escalation of piracy and armed robbery against ships passing through the Gulf of Aden and off Somalia, the naval powers of the world, in close collaboration with transnational corporations, continue patrolling the waters in the area and ensure the safety and security of ships. States across the western Indian Ocean, the Gulf of Aden and Red Sea areas should contribute to the safety and security of their ships and cargo by complying with and implementing the code of conduct on the repression of piracy and armed robbery adopted in Djibouti under the auspices of IMO.

Transport information systems: Given the high intensity of use of information in the transport sector and inadequacy of the necessary information in many African countries, ICT offers a powerful tool in accessing, processing and disseminating large volumes of information in the shortest time possible. ICT can also help save time and energy by avoiding trips to conduct meetings and collect data, with the associated reduction of emissions from road vehicles, railways and aircrafts. However, due to the ubiquitous constraint of financial and skilled human resources, the transport sector in Africa has not adequately embraced ICT.

The transport sector in the region should take advantage of the possibilities offered by ICT through: developing policies that promote increased use of ICT in all aspects of the transport system; building adequate databases of transport information; and developing strategies that encourage the use of ICT (e.g. video conferences and electronic information exchange mechanisms) as a substitute for trips and physical movement of goods and people.

Financial resources: Despite the efforts of African governments to allocate up to 8 per cent of their GDP for transport development, the amount is far below that required to finance even maintenance of the existing transport network and operations. Following the policy reforms undertaken by many African countries in the recent past, private sector participation in infrastructure development, although modest, is increasing. Involvement of the private sector in infrastructure development and operations, in addition to its contribution toward easing public resource constraints, has the potential of enhancing the productivity and efficiency of infrastructure services. However, as only few of past public-private partnership (PPP) arrangements, particularly in rail concessions, have achieved their objectives of improved services, enhanced efforts during the planning and implementation phases are required to make future PPPs succeed.

In order to secure adequate finance for the development and maintenance of transport infrastructure, the following measures need to be taken: enhancing public source financing by ensuring that an adequate share of GDP is allocated to the sector, either directly from the government budget or through government borrowings or guarantees; raising external resource mobilization capacity to take advantage of resources from multilateral and bilateral donors, as well as other innovative funding mechanisms, including those related to the global Clean Air Initiative; encouraging PPPs in the construction and operation of transport infrastructure to complement public funding. This undoubtedly calls for improving the investment climate, by updating institutional and regulatory frameworks and eliminating unnecessary bureaucratic procedures and practices; and reducing the rehabilitation and replacement funding requirements of infrastructure and rolling stock by proper and timely maintenance.

6.6 Conclusion

Transport is among the key sectors that play crucial roles in the effort to achieve sustainable economic growth and poverty reduction thereby bringing about sustainable development in Africa. In order for the transport sector to play its rightful role, it has to be developed in a coordinated manner, with the ultimate aim of bringing about a reliable, efficient, safe and environmentally sound system of moving passengers and goods.

In line with the various international declarations, more importantly the PFIA21 and the JPOI, made to give increased impetus to the implementation of AGENDA21, a number of measures have been taken in relation to the transport sector in Africa to ensure that the sector makes effective contributions to sustainable development.

In order to promote safety in the transport sector, countries need to prioritize road safety programmes and allocate adequate funds for these programmes. Countries should also ensure compliance with safety regulations and standards established by the relevant regional and international bodies, in particular ICAO with regard to air transport. Furthermore countries need support to strengthen capacity to address maritime security problems, particularly in relation to the escalation of maritime piracy in recent years, in a holistic manner, including through an in depth look at the root causes of piracy.

With regard to the development and promotion of an integrated approach to transport policy, investment for the development of sustainable transport, mitigation of the negative impact of transportation on human health and the environment and partnerships at the national level for strengthening transport infrastructures and developing innovative mass transport systems, measures taken at the regional level include, resolutions and action plans put in place by the AU as well as the conferences of ministers responsible for the different modes of transport. Significant financial and technical support has also been obtained from a number of UN organizations, the international and regional financial institutions, the EU and a number of bilateral donors.

To secure sufficient finance for the development and maintenance of transport infrastructure, countries should enhance public source financing by ensuring that an adequate share of GDP is allocated to the sector from public funds, and also by raising external resources to take advantage of resources from multilateral and bilateral donors, as well as other innovative funding mechanisms.

Despite the efforts and the achievements made so far to develop sustainable transport in Africa, formidable challenges remain, including inappropriate national policies and limited implementation of national policies and regional agreements, limited financial resources, low network connectivity, inadequate skilled human resources, inadequate database and limited use of ICT, high transport costs, poor transport safety and negative impact of transport on the environment.

In order to ensure environmentally sound and energy efficient sector, countries need to establish appropriate incentives to encourage the development and use of more efficient and cleaner modes of transport, including use of energy efficient modern vehicles, locomotives, vessels and aircrafts; promoting the use of low-energy consuming public transport systems; remove obstacles and disincentives to the development of cleaner energy sources; strengthen measures to minimize the number of vehicles in operation, particularly aging fleet, and other transport equipment with high emissions; and addressing the mobility and accessibility needs of the rural population through appropriate transport technology, including NMTs and cleaner motorized transport systems.

References

- Abdel, Gelil I. Egypt's Policies and Measures for Sustainable Transport, http://www.idrc.ca/en//ev-132146-201-1-DO_Topic.html.
- African Development Fund, (2005). Appraisal Report: Road Rehabilitation and Transport Facilitation Programme on the Southbound Bamako–Dakar Corridor, 2005.
- AfDB, (2003). Review of the Implementation Status of the Trans-African Highways and the Missing Links.
- Amsler, Yves (2001). "Can the promotion of an efficient public transportation system help improve air quality in cities?" presented at the Conference on Clean Air Initiative in Sub-Saharan African Cities, World Bank (SSATP-WBI), Dakar, 26-28 June.
- Air Transport Action Group (ATAG) and the United Nations Environment Programme, (2002). Sustainable Air Transport.
- AU (2001). New Partnership for Africa's Development Foundation Document, Abuja, Nigeria.
- AU (2001). Transport for Sustainable Development.
- AU (2006). Annual Report.
- AU (2008). State of Transport Sector Development in Africa.
- AU, 2009. Programme for Infrastructure Development in Africa.
- Boopen, Seetanah (2006). Transport Infrastructure and Economic Growth: Evidence from Africa Using Dynamic Panel Estimates, University of Technology, Mauritius.
- Bullock, R. (2005). Results of Railway Privatization in Africa, Transport Paper, World Bank.
- Burger, Philippe, 2005. A Brief History of PPPs in South Africa.
- CIA (2008). The World Fact Book, 2007.
- COMESA (2007). Report of the Twelfth Summit of the COMESA Authority, 22-23 May. Department of Transport, Republic of South Africa, 2008. South Africa Year Book, 2007/08.
- Dingen, Rob (2000). A Guide to Integrated Rural Accessibility Planning in Malawi. ILO, Harare, Zimbabwe.
- ECA (2004). Alternative Maritime Routes Linking Africa to the Rest of the World.
- ECA (2001). Compendium of Transport Related Environmental Norms in Africa.
- ECA (2001). Trans-East African Highway: Current Status of TEAH Network and the Missing Links.
- ECA (2002) UNTACDA II: Final Evaluation Report.

- ECA (2004). Accelerating Regional Integration in Africa.
- ECA (2007). Resolution of the Ministerial Round Table of the African Road Safety Conference, Accra, Ghana, 8 February.
- ECA (2008). Sustainable Development Report on Africa.
- Ecaat, J. (2004). A Review of the Application of Environmental Impact Assessment in Uganda.
- ECA/UN-Habitat (2008). The State of African Cities 2008.
- ECOWAS (2003). <http://www.ecowas.int>
- European Commission (1996). Transport Sector Guidelines: Towards Sustainable Transport Infrastructure.
- Estache, Antonio, World Bank and ECARES, Université Libre de Bruxelles (2006). Africa's infrastructure: challenges and opportunities.
- Ethiopian Roads Authority (2002). Ethiopian Rural Travel and Transport Programme.
- EU Commission (1996). Towards Sustainable Transport Infrastructure.
- FDRE (2006). National Transport Master Plan, Working Paper 11: Environmental Issues.
- FDRE, Federal Transport Authority (2003). Traffic Accidents in Ethiopia.
- Farlam, Peter (2005). Assessing Public-Private Partnerships in Africa.
- Global Environmental Facility (2006). Environmentally Sustainable Transport and Climate Change.
- Helu, Samuel O., Bridging the Gap for Enhanced Trade and Pro-Poor Growth.
- ICA (2006/ 2007). The Infrastructure Consortium for Africa, Annual Reports.
- International Civil Aviation Organization (2001). Aviation and Sustainable Development, Background Paper 9, Prepared for the Ninth Session of the UN Commission for Sustainable Development.
- International Ports and Harbours Association (2009). Ports and Harbours, March.
- Institute for Transportation and Development Policy (2007). Sustainable Transport, March.
- Kumar, A. and Barrett, F. (2008). Stuck in Traffic: Urban Transport in Africa. AICD, Background Paper, World Bank, Washington, D.C.
- Jerome, Afeikhen (2008). Infrastructure in Africa: the record. UNCTAD.
- Ministry of Finance and Economic Development of Ethiopia (2005). Plan for Sustainable Development to End Poverty (2007-2010).
- NEPAD/AU (2006). Africa's Infrastructure Development Study.

NEPAD (2004). Medium to Long Term Framework Study on Africa's Infrastructure.

Oxford Economic Forecasting (2003). The Contribution of Air Transport to Sustainable Development in Africa: Final Report on Study for the Air Transport Action Group.

Ports Management Association of Eastern and Southern Africa (2006). Our Ports: Official Publication of the Association.

Progress Report on the Implementation of the Yamoussoukro Declaration on a New African Air Transport Policy.

Rodrigue, Jean-Paul, Dept. of Global Studies & Geography, Hofstra University . Energy Consumption of the Transport Sector, posted on the Internet.

Sexsmith, Fred (2005). Status of Lead Phase-out in Gasoline in Sub-Saharan Africa.

SSATP (1999). Technical Note, No. 19, May 1999, Summary and conclusions of the study on urban transport dysfunction and air pollution in Dakar, Transport in Africa.

Sub-Saharan Africa Transport Programme (2007). Annual Report 2007.

Teravaninthorn, S. and Raballand, G. (2009). Transport Prices and Costs in Africa: A Review of the International Corridors, World Bank, Washington, DC.

UN (1992). Report of the United Nations Conference on Environment and Development, Rio De Janeiro.

UNCTAD (2006). Maritime Review for 2006.

UNEP (2006). Report on Atmosphere and Air Pollution, prepared for the 14th Session of the CSD.

UNIDO (2009). Scaling up Renewable Energy in Africa. Working Paper, January 2009.

UNTACDA (2002). Evaluation Report, 2002.

World Bank (2007). Africa Now: Building a Better Future.

World Bank (2010). Africa's Infrastructure: A Time for Transformation, Summary of Main Findings, Africa Infrastructure Country Diagnostic (AICD) Study.

World Bank (2000). Transport Corridor Agenda,

World Bank Independent Evaluation Group (2007). A Decade of Action in Transport: An Evaluation of World Bank Assistance to the Transport Sector, 1995-2005.

World Bank (2008). World Development Indicators, 2008.

Wright, Lloyd and Fulton, Lewis (2005). Transport Reviews, Vol. 25, No. 6, 691-717, November 2005.

Websites:

Ministry of Transport and Communications of Ethiopia, Website: <http://www.motac.gov.et>.

Inter-linkages



7.1 Introduction

The different thematic areas under review are all interlinked and when dealt with in an integrated way can help address the various crises, by for instance reducing the carbon intensity of growth and by increasing agricultural productivity in a sustainable way, while implementing CSD decisions. Sustainable consumption and production initiatives aim at adopting the life-cycle approach, in order to promote optimal use of resources, waste minimization and recycling, with a view to ensuring sustainable patterns of consumption and production. The chemicals, mining and transport sectors entail resource-intensive processes and have high-polluting potential. Therefore, the adoption of SCP in these sectors will go a long way in ensuring efficiency in resource use and minimizing pollution.

In terms of cross-cutting issues, the promotion of SCP in the different thematic areas calls for the adoption of holistic, integrated and participatory approaches across the board. This includes the development and implementation of appropriate policies, strategies and programmes. Since impacts are transboundary, regional cooperation should be fostered including through strengthening mechanisms for policy and programme coordination and knowledge management.

7.2 Implementation progress and achievements

Mechanisms and frameworks such as the African Ten-Year Framework of Programmes on SCP, Strategic Approach for Integrated Chemicals Management, Integrated Waste Management, Transport and Mining that seek to promote integrated and resource use efficiency have been adopted and are being promoted. Among other notable initiatives is AUC-AfDB Programme for Infrastructure Development in Africa (PIDA) aimed at ensuring integrated development of Africa's infrastructure and avoid duplication of efforts.

Many countries in the region have made progress in establishing initiatives and programmes, as well as formulating and adopting policies, strategies and legislation to foster sustainable development. These include laws and policies in the broad area of environmental management as well as in sectoral areas such as mining, energy, agriculture and health. Many African countries have also ratified major chemicals and wastes related conventions as well as other MEAs. In the mining sector, African countries have increasingly signed up to global voluntary initiatives.

Some progress is being made towards policy and programme integration mainly within the framework of the PRSs, national sustainable development strategies and SWAPs. SAICM and national SCP programmes are the other tools being promoted in the region for integrated programme development and implementation. A wide range of policies and legislation formulated in the recent past provide for transparent governance and multi-stakeholder participation including consideration of gender concerns in policy and programme formulation and implementation. As such there has generally been improvement in community participation programme development and implementation.

The region has made some progress in putting in place structures and frameworks that are important to enhance regional cooperation in a wide range of areas pertinent to the issues under consideration, including the AU/NEPAD programme as well as other regional frameworks. In addition, African ministerial conferences or councils and other mechanisms have been put in place for policy and programme coordination and advocacy.

Agricultural waste such as bagasse, straw, sawdust, cotton and coffee husks is being used in several African countries for energy production including co-generation. Some countries are taking advantage of the co-funding opportunities provided by the clean development mechanism (CDM) of the Kyoto Protocol of the UN Framework Convention on Climate Change (UNFCCC). Several countries in the region have initiated the development of cleaner energy sources and measures for improvement of energy efficiency.

7.3 Implementation challenges and constraints

Inadequate institutional, human and/or financial resources capacities continue to be a major contributing factor to the slow rate of implementation of national policies and legislation as well as international regimes on issues under review; the implementation gap is widening and crippling the achievement of the desired sustainable development objectives. Compartmentalized approaches still prevail in the implementation of global, regional and national initiatives. These approaches result in poor coordination, duplication and strain on the limited resources.

The region is confronted with systemic challenges such as inadequate capacity for monitoring, research and development (R&D). There is poor dissemination of the limited data and information collected. Opportunities to facilitate knowledge, including the use of indigenous knowledge systems, and best practice sharing are limited. Lack of national cleaner production centres in many African countries is hampering the promotion of resource efficient and cleaner production (RECP) in various sectors as well as the sound management of chemicals and waste.

7.4 Lessons learned and recommended priority policy measures and actions

- Understanding and appreciation of the various policies, strategies by the political leaderships is crucial in generating political will and commitment, which is essential in ensuring effective implementation of the strategies. There is therefore, need for effective communication strategies to enable political leadership to understand and appreciate strategies and programmes such as the 10-YFP on SCP.
- Integrated initiatives and approaches such as regional and national SCP programmes, SAICM, environmental and social management plans, as well as integrated transport master plans provide a unique opportunity for tackling cross-cutting issues and challenges in holistic and optimal manner.

Emphasis should therefore be placed on developing such integrated programmes and ensuring that priority national development strategies incorporate these initiatives. In this regard, capacity for integrated analysis, policy development, planning and implementation needs to be strengthened at national and sub-national levels. Additionally, harmonization of policies and programmes across countries in the region needs to be scaled up. It should also be ensured that appropriate institutional frameworks are established and national, regional institutes and centres of learning and specialized training and applied research and technology development need strengthening and expansion.

- There is also need to design, promote and strengthen appropriate economic, financial, as well as market-based instruments for sound chemicals management, sustainable transport development, waste minimization, mining and SCP.
- Further, the information and knowledge base for planning, implementation, monitoring and evaluation needs to be strengthened. The capacity for research, documentation and dissemination of reliable data, information and best practices at national and regional level should also be enhanced.
- Developing and implementing capacity-building programmes is required for upgrading the knowledge, including the use of indigenous knowledge systems, the skills of staff involved in policy formulation, planning and implementation as well as of those engaged in regulatory and enforcement functions.
- Scaling up existing national-cleaner production centres and expanding to countries where they do not exist is vital. These centres are platforms for development and implementation of appropriate programmes in RECP, including sound management of chemicals and waste.
- In order to achieve the set goals, global, regional and subregional initiatives should be linked and coordinated with national development processes. Countries, therefore, need to be supported to translate international initiatives into implementable national and local action plans. Moreover, such national plans should be developed and implemented in the context of achieving basic needs. A good example is linking SCP to the challenge of poverty reduction.
- Mobilizing resources from both national and official development assistance (ODA) sources needs to be strengthened to ensure substantially scaled up and sustained resources provision for the implementation of programmes at regional, subregional and national levels. Incentives should be developed and implemented to encourage and attract the private sector to invest in the development of clean and efficient energy, sustainable transport systems, sound management of chemicals and waste technologies, development of national content for the mining sector and infrastructure.
- Cooperation in development, transfer, adaptation and diffusion of appropriate and affordable technologies, particularly, energy-efficient technologies, safe chemical alternatives and cleaner technologies need to be strengthened. Moreover, there should be enhanced information exchange on such technologies.

Annex: Summary of main commitments/goals contained in the JPOI, PFIA21 and A21

Sustainable consumption and production

- a) Develop and implement a Ten-Year Framework of programmes on SCP;
- b) Increase investments in cleaner production and eco-efficiency;
- c) Develop policies and strategies on SCP patterns and integration of these into sustainable development policies, programmes and strategies including PRSPs;
- d) Promote regional and national programmes for energy and material efficiency;
- e) Enhance corporate environment and social responsibility and accountability;
- f) Encourage relevant authorities at all levels to take sustainable development considerations into account in decision-making, including on national and local development planning, investment in infrastructure, business development and public procurement;
- g) Encourage development and strengthen awareness and educational programmes to promote sustainable consumption and production patterns; and
- h) Undertake research and develop core indicators on consumption and production.

Chemicals

- a) Sound management of chemicals throughout their life cycle for sustainable development, as well as for the protection of human health and the environment. Among others:
 - Achieve, by 2020, sound management of chemicals to ensure the minimization of significant adverse effects on human health and the environment;
 - Promote reduction of the risks posed by heavy metals that are harmful to human health and the environment, including through relevant studies on, for instance, mercury and its compounds;
 - Assessing risks and establishing risk reduction programmes.
- b) Promote and take actions for the ratification and implementation of relevant international instruments on chemicals, including: the Rotterdam Convention on Prior Informed Consent Procedures for Certain Hazardous Chemicals and Pesticides in International Trade, and the Stockholm Convention on Persistent Organic Pollutants:
 - Promote efforts to prevent international-illegal trafficking of hazardous chemicals and hazardous wastes, and to prevent damage resulting from the transboundary movement and disposal of hazardous wastes in a manner consistent with obligations under relevant international instruments such as the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal;
 - Provide technical and financial support to African countries to assist them in implementing relevant international instruments on chemicals and strengthening their capacity for the sound management of chemicals.
- c) Develop a strategic approach to international chemicals management (Based on the Bahia Declaration and Priorities for Action, of the Intergovernmental Forum on Chemical Safety (IFCS)).
- d) Encourage partnerships to promote activities aimed at enhancing environmentally sound management of chemicals. Among other measures, promote international and regional cooperation and coordination.
- e) Develop and promote coherent and integrated information on chemicals such as through:
 - National pollutant release and transfer registers;
 - Globally Harmonized System (GHS) for the classification and labelling of chemicals;
 - Information exchange on toxic chemicals and chemical risks and implementing.

- f) Cooperate in the development and transfer of technology of safe substitutes and in the development of capacity for the production of such substitutes.

Waste management

- a) Prevent and minimize waste and maximize reuse, recycling and use of environmentally-friendly alternative materials, with the participation of government authorities and all stakeholders. Among others: encouraging production of reusable consumer goods and biodegradable products and developing the infrastructure required.
- b) Develop waste-management systems and extend waste-service coverage. Among others develop and promote integrated management solutions to minimize urban and industrial waste generation, and to promote recycling and reuse.
- c) Ratify and implement relevant international instruments on hazardous waste, including the Bamako Convention, the Fourth Lome Convention and Basel Convention and its protocol on liability and compensation for damage resulting from the transboundary movement and disposal of hazardous wastes.
- d) Prevent international illegal trafficking of hazardous wastes and to prevent damage resulting from the transboundary movement and disposal of hazardous wastes in a manner consistent with obligations under relevant international instruments.
- e) Global and regional cooperation, including exchange of information and experience and transfer of appropriate technologies to improve the management of radioactive wastes.
- f) Support the clean-up of sites contaminated, as a result of, all types of nuclear activity and to conduct health studies in the regions around those sites, as appropriate, with a view to identifying where health treatment may be needed and should be provided.
- g) Sound management of radioactive waste including:
- Sound storage, transportation, transboundary movement and disposal of radioactive waste guided by all the principles of the Rio Declaration on Environment and Development and by Agenda 21;
 - Provision of technical assistance to African countries to enable them to develop or improve procedures for the management and safe disposal of radioactive wastes;
 - Intensify safety measures with regard to radioactive wastes.

Mining

- a) Enhance the contribution of the mining, minerals and metals sector to the sustainable development of Africa by supporting the development of effective and transparent regulatory and management frameworks and value addition, broad-based participation, social and environmental responsibility, and increased market access in order to create an attractive and conducive environment for investment:
- Establish partnerships to further existing activities at the national and international levels among interested Governments, intergovernmental organizations, mining companies, and workers and other stakeholders to promote transparency and accountability for sustainable mining and minerals development;
 - Support efforts to address the environmental, economic, health and social impacts and benefits of mining, minerals and metals throughout their life cycle, including workers' health;
 - Enhance the participation of stakeholders, including local and indigenous communities and women, to play an active role in minerals, metals and mining development throughout the life cycles of mining operations;
 - Improve value-added processing, upgrade scientific and technological information and reclaim and rehabilitate degraded sites.

- b) Fostering sustainable mining practices through the provision of financial, technical and capacity-building support to developing countries and countries with economies in transition for the mining and processing of minerals, including small-scale mining.

Transport

- a) Develop and promote an integrated approach to transport policy making at national, regional and local levels for transport services, and systems to promote sustainable development in Africa including policies and planning for land use, infrastructure, public transport systems and goods delivery networks:
- Develop and implement transport strategies for sustainable development, reflecting specific regional, national and local conditions;
 - Promote investment and partnerships for the development of sustainable, energy efficient multi-modal transportation systems, including public mass transportation systems and better transportation systems in rural areas;
 - Use of a broad spectrum of policy instruments to improve energy efficiency and efficiency standards in transportation and related sectors;
 - Integrate land-use and urban, peri-urban and rural transport planning, taking into account the need to protect ecosystems.
- b) Provide technical and financial support to Africa by the developed countries to develop affordable transport systems and infrastructure that promote sustainable development and connectivity in Africa.
- c) Adopt and promote measures to mitigate the negative impact of transportation on human health and the environment, including measures to improve efficiency in the transportation sector:
- Promote voluntary guidelines for environmentally-friendly transport, and actions for reducing vehicle emissions of carbon dioxide, carbon monoxide, nitrogen oxides, particulate matter and volatile organic compounds;
 - Use of economic instruments for the mitigation of the negative-environmental impact of aviation in the context of sustainable development;
 - Accelerating the phasing-out of the use of leaded gasoline as soon as possible, in pursuit of the objectives of reducing the severe health impacts of human exposure to lead.
- d) Develop partnerships at the national level, involving Governments, local authorities, non-governmental organizations and the private sector, for strengthening transport infrastructures and developing innovative mass-transport schemes.