

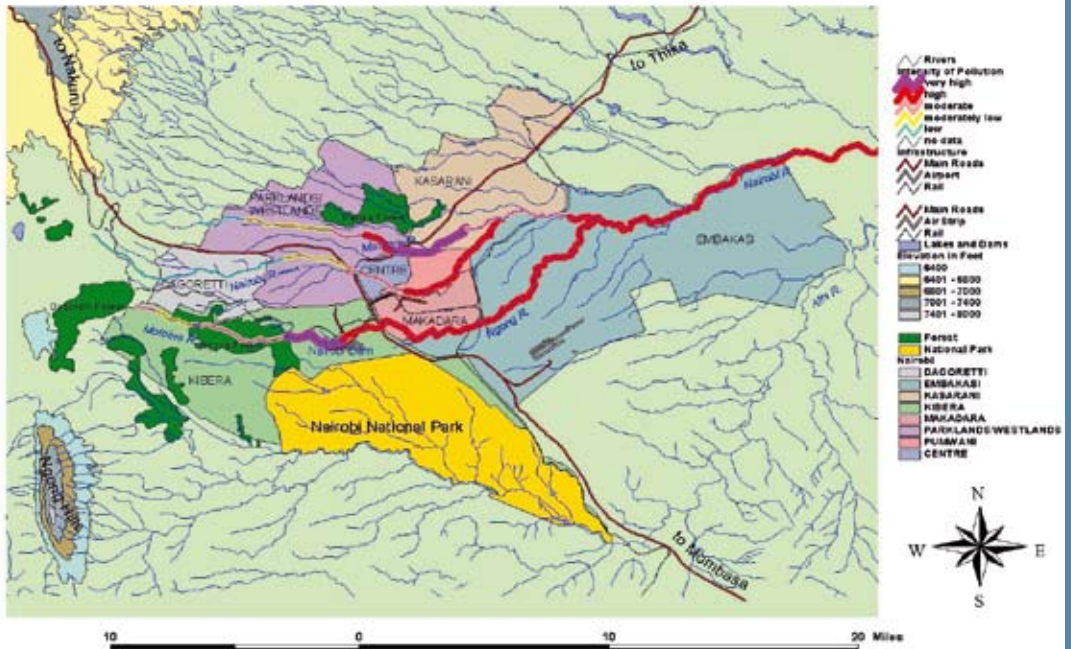
# DIALOGUE

## UNEP-KENYA

### COUNTRY

# PROGRAMME

**Overall River Pollution Map**



9th July, 2008

# PROGRAMME

## Co-CHAIRS:

1. **Hon. John Michuki - Minister for Environment and Mineral Resources;**
2. **Dr. Achim Steiner - UN Under-Secretary General & Executive Director, UNEP**

TIME	ACTIVITY
9.30 A.M.	Arrival of Invited Guests: <ul style="list-style-type: none"><li>▪ Ambassadors &amp; High Commissioners</li><li>▪ Minister for Environment &amp; Mineral Resource</li><li>▪ Senior Government of Kenya Officials</li></ul> {Display Panels, Snacks, Tea & Coffee}
9.45 A.M.	Video Clip on Nairobi River Basin
10.00 A.M.	Call Meeting to Order by the Co-Chairs <ul style="list-style-type: none"><li>▪ Welcome remarks by <b>Dr. Achim Steiner</b></li><li>▪ Objective of meeting by <b>Hon. John Michuki</b></li></ul>
10.05 A.M.	Presentation: Nairobi River Basin Programme Implementation Plan: <b>Prof. James L. Ole Kiyiapi, PS, Ministry of Environment &amp; Mineral Resources</b>
10.20 A.M	Remarks by <b>Hon. John Michuki</b> <ul style="list-style-type: none"><li>▪ <i>Minister for Environment &amp; Mineral Resources</i></li></ul>
	Open Discussion and Feedback with partners
11.30 A.M.	Remark/Recap by <b>Dr. Achim Steiner</b> <i>United Nations Under-Secretary General &amp; Executive Director of UNEP</i>
11.40 A.M.	<b>Vote of Thanks</b>

## Master of Ceremony: Henry Ndede

Coordinator, UNEP-Kenya Country Programme, Regional Office for Africa.

## **TEN-POINT INTERVENTION AND LEAD INSTITUTIONS**

INTERVENTION	INSTITUTIONS RESPONSIBLE
1. Creating awareness and assessing social impacts	<b>NEMA</b> , CCN,OGS,OP,MOPHS,MOC
2. Surveys and delineation riparian reserve	<b>MoL</b> , CCN, MoNM, DRSRS
3. Stopping discharges	NEMA,MEMR,CCN, <b>MoWI</b> , WRMA, MOHPS,MSPA
4. Completing work on the 2.5Km demo stretch	<b>MEMR</b> , NYS, CCN.ML,MOI,MCNH
5. Relocating displaced economic activities and informal settlements	<b>OP</b> , MoL, MoLG, MoNM, MoH, MoCA MOI
6. Developing integrated solid waste management	<b>CCN</b> , MEMR, MoLG, MoNM, MOI,MOHPS,MoPW, NYS, MoSP
7. Restoring Nairobi Dam	<b>NDTF</b> , UNEP, MEMR, MoWI, WARMA,MOT
8. Installing sewerage and associated infrastructure	AWSB, CCN, MoLG, MoNM, MOR, <b>MoWI</b> , MoE,MoI, MoL ,MOPW
9. Landscaping and beautification of riparian zone	<b>MoL</b> ,CCN, KFS, MEMR, MF&W, MoI, MOPW
10. Developing Master Plan for main tributaries	<b>MoNM</b> , CCN, MoL,MEMR,UNEP,MOI,MOPHS
<b>Programme Coordination</b>	<b>MEMR</b> , OP, OPM

*NOTE: The institution in bold will lead and report on progress*

# IMPLEMENTATION MATRIX FOR NAIROBI RIVER BASIN PROGRAMME

INTERVENTIONS	ACTIVITIES	OUTPUTS	KEY ACTORS
1. Creating awareness and assessing social impacts	Launching of programme implementation	<ul style="list-style-type: none"> <li>Programme implementation launched</li> </ul>	MEMR, NEMA
	Conduct a social impact assessment	<ul style="list-style-type: none"> <li>Social impact assessment report</li> </ul>	NEMA, UN, CCN, OP, MoE, Min of Youth CCN, Civil Society, Owners Associations
	Organize awareness campaign targeting general public & special localities along Nairobi River	<ul style="list-style-type: none"> <li>Radio&amp; TV programmers aired</li> <li>Articles published in print media</li> <li>Informal meetings such as barazas held</li> </ul>	NEMA, UN, MEMR, Media, CCN, OP
	Use media & other publicity avenues to reach various target groups	<ul style="list-style-type: none"> <li>Radio&amp; TV programmers aired</li> <li>Articles published in print media</li> <li>Awareness materials developed &amp; published</li> </ul>	NEMA UN, MoE CCN, Civil Society, KFS, KWS,
	Develop and implement an effective communication strategy	<ul style="list-style-type: none"> <li>An effective communication strategy developed &amp; implemented</li> </ul>	NEMA, MEMR, UN agencies
2. Surveys and delineation riparian reserve	Conduct aerial survey	<ul style="list-style-type: none"> <li>Aerial photographs</li> </ul>	DRSRS
	Delineation of 30M riparian reserves	<ul style="list-style-type: none"> <li>Riparian reserve delineated &amp; planned</li> <li>Base maps &amp; plans prepared</li> <li>Ground survey conducted</li> <li>Beacons laid</li> </ul>	MoL, DRSRS, CCN
	Production of cadastral maps & plans	<ul style="list-style-type: none"> <li>cadastral maps &amp; plans produced</li> </ul>	MoL
	Ground survey & beaconing of the riparian reserve boundaries	<ul style="list-style-type: none"> <li>Population census conducted</li> <li>List of occupants, activities, parcels of lands encroaching the riparian</li> </ul>	MoL
	Identify/ determine options for re-settlements and installation	<ul style="list-style-type: none"> <li>re-settlements and installation options identified/determined</li> </ul>	MoL, CCN, MoLG, DRSRS, NEMA
	Gazette riparian reserve for Nairobi Rivers as identified	<ul style="list-style-type: none"> <li>Riparian zone gazetted</li> <li>Date and number of Gazette</li> </ul>	MEMR, MoL, OP., CCN, NEMA, MOH

INTERVENTIONS	ACTIVITIES	OUTPUTS	KEY ACTORS
3. Stopping illegal discharges	Conduct baseline inspection survey to identify illegal discharge points and solid waste dumping sites	<ul style="list-style-type: none"> <li>Report of illegal discharge points &amp; solid waste dumping sites</li> </ul>	NEMA
	Take corrective measures to stop illegal discharges	<ul style="list-style-type: none"> <li>Corrective measures undertaken</li> <li>Short &amp; long term corrective measures undertaken</li> <li>EMPs &amp; work plans for long term corrective measures</li> </ul>	NEMA
	Regular inspections & monitoring along the rivers to ensure compliance with environmental regulations	<ul style="list-style-type: none"> <li>Inspection work plan</li> <li>Inspections reports</li> </ul>	NEMA
	Strengthen inspection unit of NEMA	<ul style="list-style-type: none"> <li>Inspection unit of NEMA strengthened</li> </ul>	NEMA
	Clarify institutional roles for sewerage management between MoWI, AWSB, NEMA, MoNM	<ul style="list-style-type: none"> <li>Institutional roles for sewerage management clarified</li> </ul>	NEMA, MEMR, CCN, MoLG, Min of Metro.
4. Completing work on the 2.5Km demo stretch	CCN to approve proposed plans and registration with MoL	<ul style="list-style-type: none"> <li>Advisory plan presented, approved &amp; gazetted</li> </ul>	MEMR MoL, CCN,
	Removal of all solid wastes from site	<ul style="list-style-type: none"> <li>Tones of solid waste removed</li> </ul>	MEMR, CCN, NEMA, NYS, Private Sector
	Carry out basic landscaping on remainder of 2.5 km demo stretch	<ul style="list-style-type: none"> <li>Area landscaped</li> </ul>	MEMR, KFS, MOSYA
	Delineate areas for planting suitable trees/shrubs/grass species	<ul style="list-style-type: none"> <li>Area planted with trees/shrubs/grass delineated</li> </ul>	MEMR, KFS, CCN, NEMA
	Construct additional ablution blocks (public toilets).	<ul style="list-style-type: none"> <li>Ablution blocks provided</li> </ul>	MEMR, CCN, Private Sector
	Relocate Maasai Market from its present site to the rehabilitated site	<ul style="list-style-type: none"> <li>Operational maasai market at the rehabilitated site</li> </ul>	Min. of Tourism, CCN, plot owners
	Identify and promote riverfront commercial and recreation activities	<ul style="list-style-type: none"> <li>Riverfront activities developed</li> </ul>	MEMR

INTERVENTIONS	ACTIVITIES	OUTPUTS	KEY ACTORS
5. Relocating displaced economic activities and informal settlements	Agree on the recommendation of social impact study	<ul style="list-style-type: none"> <li>Key stakeholders identified</li> </ul>	MEMR
	Form a relocation committee from the overall Nairobi Rivers National Steering Committee and develop ToRs	<ul style="list-style-type: none"> <li>Members of the constituted Task Force</li> <li>Relocation committee formed</li> </ul>	MEMR, MoNM, CCN, MoH, KRC, OP, KRSRBS
	Develop comprehensive steps to be followed in the relocation process	<ul style="list-style-type: none"> <li>Comprehensive steps to be followed in the relocation process developed</li> </ul>	MEMR, CCN, NEMA, MoL, MoH, MoCA
	Implement actions agreed on procuring & moving people to alternative sites following a well drawn plan	<ul style="list-style-type: none"> <li>Actions agreed upon implemented Alternative sights identified &amp; procured</li> </ul>	MEMR, CCN, NEMA, MoL, MoH, MoLG. OP. MoNM, MoCA
	Remove solid waste from vacated sites & initiate rehabilitation	<ul style="list-style-type: none"> <li>Solid waste from vacated sites removed</li> <li>Rehabilitation initiated</li> </ul>	MoL MEMR, MoL, OP, CCN
6. Developing & implementing integrated solid waste management system	Develop a comprehensive solid waste removal plan focusing on the riparian zone	<ul style="list-style-type: none"> <li>A comprehensive solid waste removal plan developed</li> </ul>	CCN, MoLG
	Identify & procure land & establish transfer station for solid waste in Nairobi	<ul style="list-style-type: none"> <li>Land for four transfer stations identified &amp; procured</li> <li>Transfer stations for solid waste management established</li> </ul>	CCN, NEMA, MEMR, MoL, MoNM, MoLG, UN agencies
	Involve NYS in removal, transportation & safe disposal of waste	<ul style="list-style-type: none"> <li>Waste removed, transported &amp; disposed off by NYS</li> </ul>	CCN, NEMA, MEMR, NYS
	Promote Reduce, Reuse, Recover, Recycle (4Rs) concept to minimize wastes	<ul style="list-style-type: none"> <li>4Rs concept promoted</li> <li>Established mechanism for separation of waste</li> </ul>	CCN, NEMA, AWSB ,Nairobi water Co.
	Involve youths and CBO in waste related enterprises	<ul style="list-style-type: none"> <li>Youths in waste related enterprises involved</li> <li>Cooperatives on waste enterprises established</li> </ul>	NEMA, CCN, MEMR, UN, CS
	Decommissioning Dandora waste disposal site	Dandora dump site decommissioned	CCN, MoSYA, SC,
	Develop a sanitary landfill at Ruai	<ul style="list-style-type: none"> <li>Modern sanitary landfill developed</li> <li>Establishment of a recycling plant</li> </ul>	CCN, MEMR, NEMA, MoNM, MoLG
	Develop an integrated solid waste management system for the city of Nairobi	<ul style="list-style-type: none"> <li>An integrated solid waste management system for the city of Nairobi developed</li> </ul>	CCN, MoLG, MoNM, MEMR, NEMA
	Develop a strategy for making Nairobi city a carbon market for CDM	<ul style="list-style-type: none"> <li>Carbon market developed in Nairobi</li> </ul>	CCN, NEMA, MEMR, UN, Private sector,

INTERVENTIONS	ACTIVITIES	OUTPUTS	KEY ACTORS
7. Rehabilitating Nairobi Dam	Establish an operating unit on the site	<ul style="list-style-type: none"> <li>Operating unit on the site established</li> </ul>	NDTF, UNEP, NEMA, CCN, MoWI
	Conduct an environmental impact assessment (EIA)	<ul style="list-style-type: none"> <li>Environmental impact assessment (EIA) conducted</li> </ul>	NDTF, UNEP, NEMA
	Dredge to remove accumulated silt, solid waste and invasive species e.g. Water hyacinth	<ul style="list-style-type: none"> <li>Accumulated silt removed by dredging</li> <li>Invasive species removed</li> </ul>	NDTF, MoWI, UNEP
	Rehabilitate and expand trunk sewer systems around Dam	<ul style="list-style-type: none"> <li>Trunk sewer lines around the dam rehabilitated and expanded</li> </ul>	AWSB, MoWI, WRMA, MEMR
	Landscape & plant trees and grass along the shores	<ul style="list-style-type: none"> <li>Area landscaped and trees planted</li> </ul>	KFS, MEMR, CCN
	Stabilize banks and pave pedestrian walk-circuit around the dam	<ul style="list-style-type: none"> <li>Banks stabilized</li> <li>Pedestrian walk-circuit around the dam</li> </ul>	NDTF
	Cut-off storm drains on Kibera side to detain waste matter emanating from the settlement	<ul style="list-style-type: none"> <li>Storm drains on Kibera side cut-off</li> </ul>	NDTF
	Identified & promote development of riverfront commercial and recreation activities	<ul style="list-style-type: none"> <li>River front commercial and recreational activities developed</li> </ul>	NDTF
8. Installing sewerage and associated infrastructure	Plan & construct a cost effective road access network along the entire riparian zone including bridges	<ul style="list-style-type: none"> <li>Public accessibility network along the entire riparian zone planned, constructed and developed</li> </ul>	MoWI, CCN, NCBD, KRC, PPP
	Complete construction of Matatu Terminus at Globe Cinema Roundabout	<ul style="list-style-type: none"> <li>Matatu Terminus at the Globe Cinema Roundabout completed</li> </ul>	MoWI, CCN
	Install security lights along the river riparian strip	<ul style="list-style-type: none"> <li>Security lights within the riparian</li> </ul>	MoWI, CCN, private sector
	Provide clean tap water and sanitation along the riparian zone	<ul style="list-style-type: none"> <li>Tap water and sanitation along the riparian zone provided</li> </ul>	NWC, MoWI, AWSB,
	Provide ablution blocks (public toilets) along the riparian	<ul style="list-style-type: none"> <li>Ablution blocks along the riparian provided</li> </ul>	MoWI, CCN, private sector, public sector
	Extend, rehabilitate & expand sewerage and drainage network	<ul style="list-style-type: none"> <li>Sewerage and drainage network extended, rehabilitated &amp; expanded</li> </ul>	AWSB, CCN, Mol, MoWI, NWC
9. Developing Master Plan for economic/ aesthetic utilization of riparian zone	Initial consultation among key government ministries/ agencies	<ul style="list-style-type: none"> <li>Minutes of meetings</li> <li>Joint programmes undertaken</li> </ul>	MEMR, all govt ministries
	Commissioning Master Plan development consultancy	<ul style="list-style-type: none"> <li>Master Plan development consultancy commissioned</li> </ul>	MEMR, UN-Agencies, MoNM, MoLG, MoL
	Hold consultations & obtain official approval for the Master Plan	<ul style="list-style-type: none"> <li>Minutes of consultative meetings</li> <li>Approval document/letter</li> </ul>	MEMR, CCN, MoL, NEMA, MoNM, MoLG,
	Promote riverfront development ventures identified under the Master Plan	<ul style="list-style-type: none"> <li>Riverfront development ventures identified under the Master Plan promoted</li> </ul>	MEMR, GoK Ministries, UN agencies, NEMA, CCN

INTERVENTIONS	ACTIVITIES	OUTPUTS	KEY ACTORS
10 Landscaping and beautification of riparian zone	Leveling & landscaping sites delineated for planting, rehabilitation for recreational use;	<ul style="list-style-type: none"> <li>sites delineated for planting, rehabilitation for recreational use leveled &amp; landscaped</li> </ul>	MEMR, NEMA, KFS, CCN, MoNM.
	Identify suitable species of trees/shrubs & grasses to be planted	<ul style="list-style-type: none"> <li>List of suitable trees/shrubs/grass</li> <li>suitable species of trees/shrubs/grass planted</li> </ul>	MoFW, KFS, MEMR, NEMA, CCN, MoSYA
	Develop management plan for recreational sites & vegetation strips along the riparian zone	<ul style="list-style-type: none"> <li>management plan for recreational sites &amp; vegetation strips along the riparian zone developed</li> </ul>	MoL, CCN, MoNM, MopW, MoLG, MoFW, NEMA, UN agencies, MEMR
	Elaborate security arrangements to ensure use of the restored/develop recreation sites by the general public	<ul style="list-style-type: none"> <li>security arrangements to ensure use of the restored/develop recreation sites by the general public elaborated</li> </ul>	KFS, CS, Youth Groups, MoSYA, Private Sector
<b>Programme Coordination</b>	Develop ToRs for the Inter-Ministerial Committee & programme of work	<ul style="list-style-type: none"> <li>ToRs for the Inter-Ministerial Committee developed</li> <li>Programme/work plans developed</li> </ul>	MEMR,
	Establish an all encompassing & functional Technical Committee	<ul style="list-style-type: none"> <li>functional Technical Committee established</li> </ul>	MEMR SC members, TC members, sub-committees & TFs, other relevant s/holders at all levels
	Establish a Nairobi River Programme Standing Secretariat under MEMR	<ul style="list-style-type: none"> <li>A functional Nairobi River Programme Standing Secretariat established</li> </ul>	MEMR
	Develop and maintain NRBP database	<ul style="list-style-type: none"> <li>NRBP data base developed</li> </ul>	MEMR
	Develop and maintain a NRBP Website	<ul style="list-style-type: none"> <li>NRBP website developed</li> </ul>	MEMR
	Establish and implement a communication & reporting mechanism	<ul style="list-style-type: none"> <li>A communication &amp; reporting mechanism established &amp; implemented</li> </ul>	MEMR, lead agencies, private sector, all other s/holders
	Strengthen capacity of Secretariat	<ul style="list-style-type: none"> <li>Capacity of Secretariat strengthened</li> </ul>	MEMR, NEMA, Lead Agencies, Private Sector
	Promote development of riverfront commercial & recreational activities among stakeholders	<ul style="list-style-type: none"> <li>Riverfront commercial &amp; recreational activities among stakeholders promoted</li> </ul>	MEMR
	Develop a long term institutional framework	<ul style="list-style-type: none"> <li>Long term institutional framework developed</li> </ul>	MEMR

# INTEGRATED SOLID WASTE MANAGEMENT PLAN FOR NAIROBI

## Background

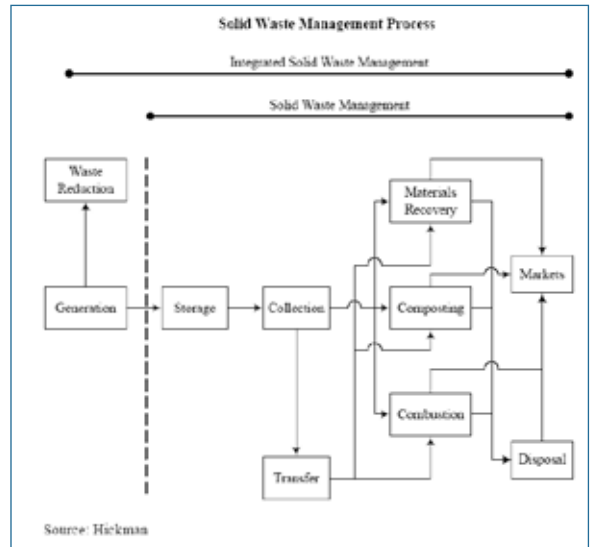
Solid waste management is a long neglected problem in Nairobi. Most of the waste generated by over four million people living the Kenyan capital ends up at the 30-acre large Dandora dumpsite, which receives an estimated 2,000 tonnes of waste every day. About 40% of waste generated is collected by the City Council of Nairobi, the private sector collects about 20% and the balance is uncollected or is disposed of through other means.

## What is an ISWM Plan?

An Integrated Solid Waste Management (ISWM) Plan incorporates all the policies, programs, and technologies that are necessary to manage the waste stream. The plan is based on the 3 Rs (Reduce, Reuse and Recycle) and includes waste characterization and quantification with future projections and assessment of the current waste management system. The Plan identifies schemes and relevant technologies for each stage of the process (source segregation, collection and transportation, transfer stations and material recovery, treatment and resource recovery, final disposal and awareness raising).

## Keys to a successful ISWM Plan

- Buy-in by all stakeholders in planning and design of the ISWM Plan.
- Adoption of new strategies for revenue generation.
- Incorporation of small-scale enterprises and the informal sector into the Plan.
- Development of waste structures for low-income areas.
- Installation of a system of accountability and responsibility at the local level.



## What are the benefits of an ISWM Plan?

- Helps in the identification of low cost solutions to waste management.
- Promotion of resource efficiency through the 3Rs.
- Reduction of negative hazardous waste related health impacts.
- Source segregation of recyclable waste would provide additional income source.
- Increased opportunity for the private sector in waste related services.
- Creation of a clean environment and safe disposal site.

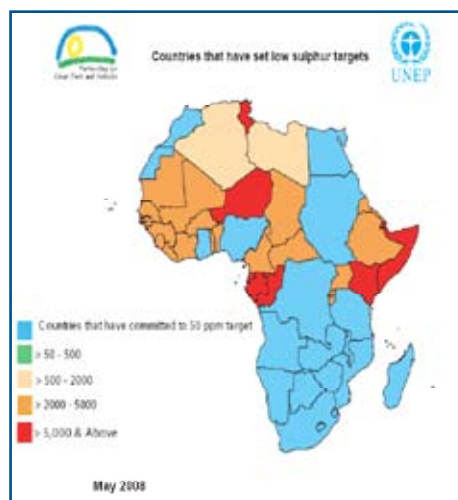


# SULPHUR REDUCTION IN DIESEL FUELS IN KENYA

## INTRODUCTION

Unlike lead in petrol that is added after refining to increase its performance, sulphur is naturally found in crude oil, albeit in varying amounts. Sulphur levels are measured in part per million (ppm) and lower the level, the better the fuel. The level of sulphur found in petroleum fuels including petrol and diesel will depend on sulphur levels in the crude oil and refinery technology. Modern refinery technologies are able to extract the sulphur during processing to near zero levels. The fuel of concern in terms of health and environmental impacts in the case of sulphur is diesel.

Vehicle emissions are estimated to account for between 70-90% of air pollution in urban areas. Particulate Matter (PM) is the main pollutant for diesel vehicles and is considered especially hazardous because of the ability to penetrate deep into the lungs. PM emissions are directly proportional to sulphur levels in diesel, thus by reducing sulphur levels in diesel, we will be addressing a significant part of urban air quality.



Whereas sulphur levels in fuels in developed countries have continued to decline over the years, with Europe expected to move to 10 ppm from January 2009 (some countries like Sweden and Japan have actually moved to 10 ppm), the levels in most developing countries remain high. UNEP has been supporting countries, through the Partnership for Clean Fuels and Vehicles (PCFV) to lower sulphur levels in fuels. The Partnership which brings together over 100 partners from government, private sector and civil society countries has set 50 ppm or below as the global sulphur target.

In the Sub-Saharan Africa (SSA) region, South Africa is already marketing 50 ppm in all the major cities and there are plans for the country to move to 50 ppm. The 14 Southern African Development Community (SADC) countries also agreed to move to 50 ppm during a meeting held in March 2008. Ghana and Nigeria also have plans to move to lower sulphur fuels (see below map on the African countries that have committed to lowering sulphur to 50 ppm).

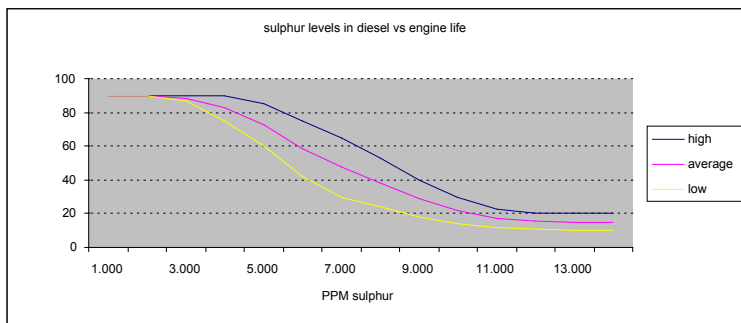
In Kenya, the refinery supplies about 50% of diesel fuel consumption locally which is at 10,000 ppm sulphur while imports are at 5,000ppm. As internationally refineries upgraded to be able to meet the demand for lower sulphur fuels, countries including Kenya will automatically have to move to these lower sulphur grades. It would be good for Kenya thus to be proactive and be a regional leader by moving to lower sulphur importation of 50 ppm.

## Benefits of lower sulphur fuels

1. **Reduced vehicle emissions:** Reducing sulphur levels in fuels will reduce vehicle emissions from all vehicles (both old and new). By reducing sulphur levels in diesel to 50 ppm, particulate matter emissions are reduced by more than 75% in all vehicles. This will have significant health benefits. Also by reducing sulphur, countries can effectively take advantage of new vehicle emission control technologies that

are already available and reduce vehicle emissions further by up to 95%, in the case of very low sulphur. It is therefore recommended that sulphur levels be at the very minimum 500 ppm and below to allow the use of these emission control technologies

2. Improved health: Some of the known health effects of high sulphur levels particularly in diesel fuels include breathing problems, respiratory illnesses, changes in lung defences, and worsening of respiratory and cardiovascular diseases. People suffering from asthma or chronic lung or heart disease are more susceptible to exposure.
3. Reduced vehicle maintenance and increased engine life: Lower sulphur diesel reduces vehicle wear and tear, leading to longer maintenance intervals and thus reduced maintenance costs. The presence of sulphur in diesel also significantly reduces the life of vehicles engines. The graph below shows decreased engine life as a result of higher sulphur diesel fuels. By moving from 5,000 ppm to 10,000 ppm sulphur diesel the engine life decrease can be between 40% and 60%; while from 2,000 ppm to 5,000 ppm can decrease engine life anywhere between 35% and 5%; and from 1,000 ppm to 10,000 ppm will almost half the life of the engine (decrease of 70-80%).



There are different options and costs for countries for moving to lower sulphur, depending on refining capacity and supply sources. Countries that import fuels can easily switch to lower sulphur fuels. Kenya imports about half of her country requirements from the

Arabian Gulf. The other half is supplied by the refinery. There are plans to upgrade the refinery which when completed, will result in production of fuels with sulphur levels of 30 ppm.

Studies carried out worldwide show that the benefits of moving to lower sulphur fuels always outweigh the costs.

### Recommendations for Kenya

1. Implementation of the refinery upgrade to produce lower sulphur fuels, which when completed will produce 30 ppm.
2. Importation of lower sulphur diesel (50ppm) as soon as possible. This will also enable neighbouring countries to switch to lower sulphur diesel.
3. Segregation of the imported lower sulphur diesel at retail pump stations to ensure cars with cleaner emission control technologies function effectively. This would also allow for the marketing of lower sulphur fuels in urban areas, where the impacts of air pollution are higher. This is a strategy that has been adopted by some countries like South Africa, Brazil and Egypt.
4. Importation of cleaner vehicles and age limitation for second hand vehicles.
5. Introduction of vehicle inspection and regular vehicle maintenance programs to reduce vehicle emissions.

