WORLD WETLANDS DAY 2/2/2009

RAND FOR DEVELOPMENT

"Innovation, Culture & Ecology: The Surest Path to Achieving the United Nations Millennium Development Goals"

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EDITORIAL

On the eve of the Kenya We Want National Conference; there's one thing we urge the government to do, that is to immediately deliberate on the National Wetlands Policy which is yet to be tabled before the cabinet. Without this vital policy in place, then it would be business as usual with wetlands coming under continued pressure.

All eyes are on His Excellency the Prime Minister, the Rt. Hon. Raila Odinga who set up the Task Force on the Mau Forest Complex whose recommendations have far reaching effects of how we are to rehabilitate one of our water towers. As a national leader, he will have to take decisive steps which might in the short term be painful but extremely essential in order to safeguard our environment and do away with the political shenanigans whose myopic vision does not enable them to see beyond the general elections.

Given the interrelationship between wetlands and river basins, a field study of the Lake Victoria Basin reveals neglect and further action has to be taken without any further delay especially to deal with the water hyacinth menace. We cannot rule out the high HIV/AIDS prevalence in the fishing communities despite of all the efforts made. An overview of the fisheries sector and its contribution to the national economy cannot be underestimated. It's a big boost as fishing has been elevated from a department to a full ministry and it's already in the process of developing a fisheries policy. I wish you a good reading we welcome your feedback.

World Wetlands Day 2009

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Message from the Ramsar Secretary General

World Wetlands Day provides us all with one special opportunity every year to highlight the importance of the world's wetlands to the planet's health and to our own lives. This year's theme – "Upstream, Downstream: wetlands connect us all" – is especially apropos, because it focuses our attention on the many ways in which our local wetlands depend upon, and influence, the actions of others, and it helps to demonstrate our need for cooperation and collaboration with many other stakeholders in other sectors of government and society and in other parts of our geographical regions.

Sooner or later, we find that it is nearly impossible to work alone to preserve the healthy functioning of our own natural environments. The interconnectedness of our wetland and water systems means that we must always look for opportunities to work together throughout our river basins or catchments, to find common ground and agree common objectives, and to do our own parts with a common sense of purpose.

All over the world, citizens and organizations and government agencies are celebrating and educating the public about the important values of our wetlands. On behalf of the Ramsar Convention Secretariat, I send my greetings to all of you, and I wish you a productive World Wetlands Day.

Anada Tiéga

Secretary General

The Climate Petition: Seal the Deal

This powerful campaign aims to encourage the governments of the world to agree on a deal that will protect people and the planet.

Reaching a deal on climate change in Copenhagen will depend not only on political negotiations but also on public support. To galvanize support globally towards this goal, the world is invited to unite to combat climate change by signing the Climate Petition.

The world urges world leaders to:

Seal the Deal at COP 15 on a climate agreement that is definitive, equitable and effective.

Set binding targets to cut greenhouses gases by 2020 to avert the climate change threat.

Establish a framework that will bolster the climate resilience of vulnerable countries and protect lives and livelihoods.

Support developing countries' adaptation efforts.

Seize this defining opportunity to protect People and the Planet.

Power green growth; launch the green, low carbon economy of tomorrow

Seal the Deal

Power Green Growth

Protect People and the Planet

Spread the message: Seal the Deal!

The Rand Institute urges all the stakeholders to sign the petition which is available at www.sealthedeal2009.org/petition

WHAT'S CUTTING AT THE RAND INSTITUTE

Diploma in Combating Desertification

The long awaited Diploma course on Combating Desertification has finally been launched. It has taken us three years to put up the course which was meant to be introduced in the International Year of Deserts in 2006.

The contents will include desertification and development, the UNCCD and scientific programs on deserts. Objectives of the course are to improve the visibility of the United Nations Convention to Combat Desertification (UNCCD); to explain the contents, objectives and to support the implementation of the UNCCD; to disseminate information and awareness-raising on the theme of desertification; to encourage participants to take action to combat desertification through the promotion of sustainable land use and management and to present success stories in the struggle against desertification and how the positive experiences can be replicated in other parts of the world.

Individuals interested in enrolling for the course are requested to send an email requesting for the application form. Enrolment is open to all intended audiences on a non competitive basis. The target includes staff of local community based organization, NGO's, environment regulatory agencies and watch dogs, students and teachers of international environment law as well as officials in the Ministry of Environment, Foreign Affairs or whose mandate includes the environment and natural resources.

The technical requirements include a computer connected to the internet and a valid email address to be used for the entire period of your study. Successful participants will be awarded a Diploma with the course contents printed on the back. We thank all you who have in one way or another provided support for this E Learning initiative.

Celebrations to mark the World Wetlands Day

The Rand Institute is proud to be associated with the World Wetlands Day 2009 under the theme *Upstream-Downstream: Wetland Connect Us All*. In Kenya, we have 5 Ramsar cites namely Lake Nakuru, Lake Naivasha, Lake Bogoria, Lake Baringo and Lake Elmentaita. There's potential for more designated sites namely the Tana River delta, Lake Victoria Basin, Yala and many more regions.

The World Wetlands Day is marked every year on 2nd February on the anniversary of the signing of the Convention on Wetlands in the Iranian city of Ramsar on the shores of the Caspian Sea. Each year since 1997, the stakeholders have taken this opportunity to raise public awareness of conservation and wise use of wetlands.

The Rand Institute is working out modalities for involvement in a revamped Kenya Wetlands Forum which is the Ramsar National Focal Point for Communication, Education and Public Awareness (CEPA). In the meanwhile, we do hope that the designated Government National Focal Point the Kenya Wetlands Working Group under the National Museums of Kenya will be adequately involved as set out by the Ramsar Convention.

On this year WWD, the Rand Institute will conduct a field study on the Lake Victoria Basin and how to overcome the challenges affecting the 2nd largest fresh water lake in the world; an advisory letter to the Commissioner of Lands in regards to subdivision of a wetland in Nyandarua South district and advising on the best way forward; distribution of WWD 2009 educative materials at strategic places around Kisumu City and a press release on the destruction of the Mau Forest Complex and the dwindling numbers of flamingoes on the Lake.

Basin wetlands: providing ecosystem services for people

Hydrological functions of wetlands

•**Flood alleviation** In recent years major flooding events have taken place all over the world with the associated loss of life, property and livelihoods. Almost two billion people are living in areas considered to be high flood risks. Flooding is an essentially natural process that plays a key role in fertilizing floodplain soils, and this natural cycle has supported human livelihoods for millennia – but these days our engineering skills have allowed us to 'reclaim' and isolate floodplains with dams, levees, canals, etc., with the result that many modern cities and important agricultural areas are now sitting upon those ancient floodplains, the natural overspill areas during storms and heavy rainfall. The scenes of devastation by floodwaters that regularly appear on our television screens help us to remember why we need to work toward restoring our floodplains and rely again on the natural flood alleviation functions of the wetlands!

•**Groundwater recharge**. As we saw above, underground aquifers store around 97% of the world's unfrozen freshwater. They provide drinking water for between 1.5 and 3 billion people – one quarter to one half of the global population – and they play an important role in irrigated agriculture. The link between wetlands and groundwater is complex and highly variable between wetlands, but broadly we can say that many wetlands and groundwater sources are closely associated. Some aquifers depend for recharge almost entirely on the downward seepage of water from a wetland, while conversely some wetlands may depend on the outflow from an aquifer as their water source. Then, too, some wetlands are both takers from and givers to aquifers depending on the conditions at any point in time. The Hadejia-Nguru wetlands in Nigeria play a key role in recharging aquifers that are used by local people for domestic water supplies, a service that has been valued at US$4.8 million per year. Similarly, the water storage and aquifer recharge value of a 223,000-hectare swamp in Florida has been valued at US$25 million per year.

•**Water storage**. Wetlands (including under-ground aquifers and artificially constructed reservoirs) are the world's freshwater stores. What more can we say? We need them in a stable, healthy condition and we need them all.

Ecological functions

•**Improvement of the quality of water**. If there is one thing that ALL humans do that impacts upon wetlands, it is to produce waste! We do it in various ways – by introducing into our waterways excessive sediments through land-use practices, heavy inputs of nitrogen, phosphates and sometimes pesticides from agricultural runoff, toxic substances from industry (including heavy metals), either accidentally or intentionally dumped, and poorly treated or untreated domestic sewage and wastewater. Wetland plants help to trap sediments and can be effective in removing excess nitrogen and phosphorous; they can deal to some extent with pathogens as well. Specially-constructed wetlands can even remove some heavy metals and other industrial wastes from water, or they can store the wastes in the wetland sediments until they can be safely removed. Wetlands are indeed water purifiers – but of course there are limits; when we pass those limits, we impair the capacity of wetland ecosystems to function

normally and deliver the many services we enjoy.

•Biodiversity support. Relative to total area, freshwater inland wetlands have a higher species diversity than either marine or terrestrial ecosystems. For example, just looking at fish, marine areas cover roughly 67% of the globe, inland waters only 1%, yet inland waters are home to 40% of the world's fish species. It is also estimated that 25-30% of all vertebrate diversity is concentrated in and around wetlands. This biodiversity is what keeps our wetland ecosystems functioning.

•Nursery areas for fish. Nurseries for fish are especially important in coastal areas where estuaries and oceans meet. Reducing water outflow or pouring pollutants out to these areas from our river basins can have dramatic impacts on the nursery areas that are essential to support marine fisheries, our main source of fish at a global scale. The reduction in sediment carried by rivers to the sea, often because of dams, can also reduce the 'nutrients' that ensure the quality of important nursery areas for marine fish. Floodplains in river basins also provide essential breeding and nursery areas for certain freshwater fish species.

•Fish production. While inland waters only provide 10% of global fish catches, they are critical to the livelihoods of millions and provide the only source of protein in some developing countries. They employ over 50 million people globally and provide recreational fishing opportunities for hundreds of millions. In the Lower Mekong Basin in Asia, an estimated two million tons of fish and other aquatic animals are taken and consumed annually with a total value of US$ 2 billion. Wetland ecosystems need to have adequate quantities and quality of water to sustain this vital food production.

•Plant growth. Many species of freshwater plants occur over very broad geographical ranges. The most famous aquatic plant of course is rice, the staple food for half the world's population. Although no naturally growing aquatic plant is exploited on the same scale as rice, other freshwater aquatic plants are used as animal fodder, harvested for human consumption, and used for building materials. Excess nutrients in wetlands can promote excessive plant growth leading to a gradual deterioration in the health of the wetland – and the loss of some of the ecosystem services.

The Need for Everyone's Involvement

Since we all live in a river basin somewhere, should we be involved in its management? At the site level, there is a great deal of evidence of the involvement of local stakeholders in managing Ramsar sites and other wetlands around the world. While this can be Why should stakeholders be involved in either of these? Because top-down management without input from the broad range of users is usually bound for failure – this much the Ramsar Convention has learned in its 37 years of wetland conservation.

The challenges are considerable, not least because many stakeholders While the challenges are great, so too are the benefits – there are so many 'users' of the water in river basins that reaching a common understanding and appreciation of the diversity of needs, managing the range of expectations, and ensuring a facilitated process that allows stakeholders to reach agreement on management solutions has proved to be worth the effort – unless everyone is on board, any management plan is likely to have implementation problems.

Adapted from 9 things we all need to know about river basins.

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An Assessment of the Ramsar Convention on Wetlands: Challenges for the Future

The preamble of the **Convention on Wetlands of International Importance especially as Waterfowl Habitat** popularly known as the Ramsar Convention states that the principal objective is to 'to stem the progressive encroachment on and loss of wetlands now and in the future'. Article 1 defines wetlands as 'areas of marsh, fen, peatland or water, whether natural or artificial, permanent or temporary, with water that is static or flowing, fresh, brackish or salt, including areas of marine water the depth of which at low tide does not exceed six metres'. The most prominent factor of this diverse geographical features is reflected in the full title of the Convention is their importance as waterfowl habitat.

Article 2 creates the List of Wetlands of International Importance for which each party is obliged to designate at least one example upon signature, ratification or accession. Wetlands are to be selected for the list on account of their international significance in terms of 'ecology, botany, zoology, limnology, or hydrology', though those of importance to waterfowl are singled out for priority attention.

The substance relating to wetlands includes Article 3 where parties are to formulate and implement their planning so as to promote the conservation of listed sites and, as far as possible, the wise use of all wetlands in their territory. In addition, Article 3 (2) provides that the parties must arrange to be informed at the earliest possible time of actual or likely changes in the ecological character of listed sites and transmit this information without delay to the Ramsar Bureau. The purpose is to establish some form of international monitoring of the ecological condition of internationally important sites, and the Conference of the Parties is empowered under Article 6 to consider such information and to make appropriate recommendations to the parties.

Article 4 obliges the parties to promote the conservation of wetlands and waterfowl by establishing nature reserves on wetlands, whether included in the list or not, and to provide adequately for their wardening. In particular, where they delete or restrict the boundaries of listed sites, they are as far as possible to compensate for this through the creation of additional nature reserves.

Although the Ramsar Convention is not part of the United Nations System of treaties, the Director General of the United Nations Educational, Scientific, and Cultural Organization (UNESCO) serves as the depositary. The other convention on environment under the auspices of UNESCO is the *Convention Concerning the Protection of the World Cultural and Natural Heritage (World Heritage Convention), Paris, 1972.*

The secretariat services are provided by the IUCN – The World Conservation Union, international Non Governmental Organization (NGO) providing services to sovereign states in hosting a major treaty regime. The Conference of Parties (COP) is the policy making organ of the Convention which reviews the general trends in the implementation as reflected in the national reports and adopts decisions to improve the way in which the Convention works.

The most recent COP was held in day in Changwon, Republic of Korea from 28th October 2008 to 4th November 2008 under the theme of ***'Healthy Wetlands, Health People'***, focusing on the link between human well being and the functions of wetlands.

Africa has been privileged too as Kampala, Uganda hosted the 9th COP in the year 2005. Administrative and Technical issues are supplemented by the Scientific and Technical Review Panel (STRP). There are ad hoc committees and working groups whose compostion is on regional basis but members act in individual capacity as opposed to representatives of those geographical regions.

If there's one highly commendable feauture of the Ramsar convention, it's the involvement of NGO's in its program. The IUCN, apart from providing a secretariat at its Gland headquarters in Switzerland, World Wide Fund, Birdlife International, the International Water Management Institute and Wetlands International have the formal status of partner organizations. They have all designated representatives to participate as a member of the STRP and to liaise with their relevant expert networks or specialist groups to provide the necessary expertise and advice.

The total area of wetlands is 667 million hectares as per the UNEP. There are currently 180, 000 sites in 159 countries as to date occupying a total land area of 100 million hectares. Moe needs to be done in order to increase the member countries to at least 175 countries by the next COP. The Okavango Delta in Botswana covering 100, 000 hectares is one of the largest in the world. The Netherlands has the highest number of designated sites; more than 150 which is more than the minimum one.

The National Level Implementation

The COP has encouraged parties to go beyond the minimum obligation of listing one site but much depends on geographical locations. Those located along migration flyways are likely to have numerous important coastal wetlands while those in desert countries will be negligible. That explains why Europe has the highest number of designated sites.

Site Management

The achievement of the ongoing ecological condition and preservation of wetlands depends upon effective management at site level, the identification and implementation of conservation and management priorities. Environmental quality will deteriorate if contracting parties do not implement their Ramsar obligations and effective management lacking. Where wetland habitat has been degraded, there is need to reverse such processes.

Just before the meeting of the COP, parties are required to submit their national reports upon implementation. This is through a standardized simplified manual so as to encourage members to prepare their reports in good time. At the 10th Meeting of the COP in Changwon, Korea; 120 countries provided their reports, an impressive number by all standards although more parties should be assisted where necessary so as to encourage 100 % compliance.

National Wetlands Policies and Institutions

The adoption and implementation of a national wetland policy is one of the highest priorities. In Kenya, the policy documented has been awaiting cabinet approval since its completion. Uganda and Canada already had a wetland policy in 1993 while a goal of 100 parties with national wetland policies or similar strategies within broader environmental/water policies as set by COP 8 in Valencia, Spain 2002 is yet to be reached.

The review of national laws and institutions in order to ensure their compatibility with the Ramsar obligations of conservation and wise use is a priority. One specific

desirable institutional development has been the establishment of a national wetland committee (incorporating NGO's) to provide a focus for domestic implementation of the Ramsar Convention.

The goal of establishing coordinating mechanisms in all contracting parties and formal national committees in 100 of the parties has not yet been met. The process of identifying, priorities and targets with respect to other Ramsar objectives, including the integration of the conservation and wise use principle into domestic planning and the training of appropriate personnel, has been undertaken.

International Level Implementation

The Ramsar Small Grants Fund (SGF) was designed to provide assistance to developing countries and economies in transition with various aspects of wetland conservation and management. From 1991 to 2007 the Fund has provided a total of 7.3 million Swiss Francs to 217 projects from 104 countries, providing up to 40,000 Swiss francs (about US$32,000) per project. Over this same period, 470 feasible projects were not supported due to lack of funds. The Fund relies exclusively upon voluntary contributions from government agencies and national and international NGOs.

Suitable project proposals are those which contribute to the implementation of the Convention's Strategic Plan 2003-2008 for the conservation and wise use of wetlands; provide emergency assistance for Ramsar sites; or provide 'preparatory assistance' to allow non-Contracting Parties to progress toward accession.

The provision of funding also operates at the regional level through the Wetlands for the Future Fund, administered jointly by the Ramsar Bureau and the United States Fish and Wildlife Service which aims to benefit Latin American, Caribbean institutions and individuals through capacity building and training in the conservation and wise use of wetlands.

This initiative promotes the implementation of the concept of "wise use" of wetlands through strengthening the capacity of countries to manage their wetland resources in perpetuity and contributing to integrate wetland conservation and management with the development process. All proposed activities should be in line with the principles, recommendations and guidelines of the Ramsar Convention.The sponsors of Wetlands for the Future wish to establish partnerships with training institutions catalyze wetland training activities currently underway or planned within the region, or complement existing training and education initiatives with wetland-related instruction.

The Montreux Record

The establishment of the Montreux Record of Sites which are undergoing changes in their ecological character as recommended by the 4th Meeting of the COP in Montreux, Switzerland. The Ramsar Bureau, in consultation with the Contracting Party maintains a record of Ramsar sites where such changes in ecological character have occurred, are occurring or are likely to occur, and to distinguish between sites where preventive or remedial action has not as yet been identified, and those where the Contracting Party has indicated its intention to take preventive or remedial action or has already initiated such action; and gives priority to application of the Ramsar Monitoring Procedure, within the limits of budgetary constraints, at sites included in this record.

The Ramsar Advisory Mission (originally the Monitoring Procedure) is a

site visit by a multidisciplinary team of wetland experts who produce a detailed analysis of the situation and recommendations for remedial action. In several cases, there have been joint missions with other agencies, such as IUCN and the World Heritage Committee.

Co-operation among the Parties

Article 5 of the Ramsar Convention requires the parties to consult with each other about implementing obligations arising from the Convention, especially with regard to transboundary wetlands and shared water systems. Parties are also encouraged to 'endeavor to co ordinate and support present future policies and regulations concerning the conservation of wetlands and their flora and fauna'.

A report prepared by the World Conservation Monitoring Centre reveals that of around 1000 Ramsar sites surveyed, some 28% fell within international river basins and guidelines have already been established to deal with this aspect of Article 5. A number of co-operative arrangements have been established fro the conservation and management of wetlnd flora and fauna, especially migratory waterbirds, among them the North American Waterfowl Management Plan, the Western Hemisphere Sharebird Reserve Network, and the Asia-Pacific Migratory Waterbird Conservation Strategy.

Twinning or networking of sites in different countries are designed to encourage the sharing of information, expertise, and resources in relation to the management of similar sites or those linked by migration routes. They may also provide a framework for the provision of development assistance or the exchange of personnel for training purposes. Affluent countries can also provide financial assistance to the developing countries in managing their Rmsar sites, an idea which has not yet been fully exploited.

In his report to the COP 10, Changwon, Republic of Korea, the Secretary General, Mr. Anada Tiéga stated that challenges include the image of the convention; importance of wetland issues in national/international planning; the secretariats capacity to respond to growing needs of the parties; core budget and funding for the COP. He further called for action to save invaluable wetland areas in Africa particularly Lake Victoria and the balance between food security, biodiversity and water supply.

Conclusions

The Ramsar secretariat had in 2002, set a target of at least 250 million hectares of Wetlands of International Importance by 2010. Currently there are 1822 sites, totaling nearly 168 million hectares with the additional being the Ngiri-Tumba-Maindombe an area twice the size of Belgium area in the Democratic Republic of Congo (DRC) as the largest Wetland of International Importance in the world. The target is yet to be achieved but with more conceited efforts by the various stakeholders, this target can be surpassed.

The Ramsar SGF, a valuable mechanism for facilitating the implementation of the convention in developing countries, especially small island states and countries with economies in transition is still under funded. The level of voluntary contributions has only been sufficient to fund 17 projects during the triennial 2006-2008, while another 77 valuable proposals submitted by eligible contracting parties could not be funded due to a serious lack of funds.

In its Third Assessment Report, the Intergovernmental Panel on Climate Change (IPCC) concluded that some wetlands, including reefs, atolls, mangroves and those in prairies, tropical and boreal forests, and arctic (including permafrost0 and alpine ecosystems, are considered to be amongst those natural systems especially vulnerable to climate change because of their limited adaptive capacity and that they may therefore undergo significant and irreversible damage. At the COP 10, Changwon, Republic of Korea, it was noted with concern that warming of the climate system is unequivocal and wetlands have not been exempted.

The key objective of the Communication, Education, Participation & Awareness (CEPA) is to enhance awareness of wetland values and functions. This include the development at the national level of educational programmes concerning wetlands, both through formal academic instructions and more generally through provision of information to the public at zoos, museums and dedicated wetlands centres; the organization at the regional level of conferences and workshops devoted to wetlands issues.

As of November 1 2008, 129 contracting parties (82%) have designated Government Communication, Education, Participation & Awareness (CEPA) focal points and 106 parties (67%) their national non governmental focal points, but it is of concern that a significant number of parties have not yet done so, thus limiting the opportunities for coordinating CEPA delivery under the Convention. At the same time, 29 contracting parties had formed their national CEPA Task Force. Till then, only five contracting parties (Australia, Germany, Hungary, Spain and the UK) had formed their National CEPA Action Plans.

In Kenya, the National Administrative Authority is the Kenya Wildlife Service (KWS); the designated government national focal point for matters relating to the CEPA Programmes is the Kenya Wetlands Working Group under the National Museums of Kenya and the designated national focal point for matters relating to the CEPA is the East African Wildlife Society.

The countries national report to the COP 10, Changwon, Republic of Korea; the greatest difficulties in implementing the Ramsar Convention included that a proper inventory and description of types of wetlands is still lacking to date, the initial inventory having been done more than one decade ago and has since not been updated. There is therefore inadequate recent information to guide decision making and even policy formulating process.

The Kenyan government has not been able to commit adequate resources to support wetlands conservation & management. Wetlands are also not among the priority areas of focus with the management planning agendas of different ministries and departments. The flow of information and awareness programme especially during important events like the WWD been wanting. Some development partners have continued to exert pressure on the central government to reclaim wetlands.

To conclude, how the Ramsar Secretariat will overcome the challenges is the most important and not to dwell on the perceived weakness. After all, Ramsar's mission is the conservation and wise use of all wetlands through local and national actions and international cooperation, as a contribution towards achieving sustainable development throughout the world.

The Kenya We Want is an Environmental conscious Nation

As thousand of delegates from all over the country converge at the Kenyatta International Conference Center (KICC), Nairobi for the Kenya We Want National Conference from 4th to 6th February 2009 organized by the Ministry for Planning and Vision 2030, I will be leaving the City for the Millennium City of Kisumu where the Rand Institute traditionally celebrates the World Wetlands Day.

With the ambitious target of making Kenya a middle income nation as set out by Vision 2030, the environmental agenda appears to have been sidelined due to the quest for generating wealth and uplifting the living standards of Kenyans. However, the worst form of poverty is destruction of the environment which leads to resource conflict.

Kenya's environment needs can be summed up in the following although it's not exhaustive of our environmental concerns;

Destruction of Wetlands:

Wetlands in Kenya cover between 2% and 3% of the country's surface area and harbour a substantial proportion of the country's water resources. Some of the country's major wetlands are; the shallow lakes of the Gregory Rift Valley, the edges of Lake Victoria and mangrove forests of the Coast. There are also hundreds of small wetlands (such as swamps, small lakes, soaks and riverine floodplains) distributed throughout the wetter parts of the country as well as smaller wetlands occurring in the direr parts of the country.

Wetlands are rich ecosystems, which perform critical ecological functions and provide essential livelihood products and services. Critical wetlands functions include groundwater recharge and discharge, flood control, erosion control, sediment/toxicant retention (purification), nutrient retention, microclimate stabilisation, water transport and recreation. Products derived from wetlands include forest products, wildlife resource, and fisheries. Wetlands are habitats for biological resources and serve as feeding, spawning and refuge sites for a number of migratory birds. In some places they serve unique cultural functions.

However, their importance and attributes that are not directly related to human use are not often appreciated until they are destroyed, modified or restoration of the wetlands to provide those services proves too expensive. Kenyan wetlands are diverse in type and distribution, but no national inventory on the type, status and location currently exists. Like most wetlands world-wide, Kenyan wetlands are faced with numerous threats, among them; pollution and other forms of degradation, conversion to other uses especially for agriculture and settlement and over-exploitation of their resources. Currently, the management of wetlands is under various institutions whose activities and mandates are uncoordinated, sometimes over-lapping and ineffective. Integrated and innovative management and conservation approaches are therefore required based on the multiple uses of the wetlands.

Desertification, Land Degradation and Drought

Desertification is defined as the degradation of land areas in arid, semi-arid, and dry sub-humid zones as a result of various factors, including climatic variations and human activity. Such degradation of lands in arid areas appears through deterioration of the tree cover, soils and water resources, and leads, on a human and time scale, to a reduction or destruction of the biological potential of lands and the capacity of the latter to assure the livelihood of people living there.

Drought is the naturally occurring phenomenon that exists when precipitation has been significantly below normal recorded levels causing serious hydrological imbalances that adversely affects land resources production systems.

The consequences of desertification are loss of productivity of the land, reduced soil productivity, ecological disruption, increased frequency of drought, loss of genetic diversity, degradation of water resources and increased atmospheric dust. Desertification leads to resources conflicts, migrations of people, social dislocation and poor health and quality of life.

Depleting Wildlife Resources

Wildlife constitutes an important natural resource with substantial socio-economic cultural, scientific, aesthetic and environmental values and should be properly managed. The recent wildlife policy which the Rand Institute presented its views aims at managing and conserving wildlife so as to optimize returns in terms of cultural, aesthetic, scientific as well as economic gains.

The principal goals of the wildlife policy is to conserve the natural environment including flora and fauna; reduce human wildlife conflicts; to use wildlife resources sustainably for national economic development and for the benefit of local communities and to protect persons and property from injury and damage from wildlife.

Scarcity of Water Resources

Kenya has five major drainage basins mainly; Lake Victoria, Rift Valley, R. Sabaki, Tana River and Ewaso Nyiro. The drainage system consists if rivers draining into the Indian Ocean and Lake Victoria. The main rivers draining into the Indian Ocean are Tana, Athi and Ewaso Nyiro while those draining into Lake Victoria include Nzoia, Yala, Nyando, Migori e.t.c.

Water pollution contributes to increased incidences of waterborne diseases reduced fish yields and threatens biodiversity. There have been cases of severe local pollution, particularly where there are intensive industrial, agricultural or human settlement activities. Soil erosion is a major problem in many river catchments areas. This has direct impact on the soil quality, life of reservoirs, irrigation channels and the life of aquatic ecosystems.

Flooding is a recurring problem affecting the Lake Victoria and Tana River basin. Flood control should therefore be a priority concern because of the frequency and the magnitude of the damage that floods cause. The level of water volume also fluctuates periodically. Pollution by agro-chemical industries and municipal wastes, reduced water flow and siltation are only some of the threats to the water resources.

Fisheries and Marine Resources

Fisheries resources in freshwater have been over harvested in many areas especially in Lakes. Indeed, catch per fishing effort has been dropping indicating that the maximum sustainable yield is below the present level of exploitation.

The introduction of exotic fish species has altered the food web structure in major lakes and this has led to a dramatic decline in diversity of indigenous food species. Other factors which have affected the status of fresh water lakes and fisheries include over fishing and harvesting of brood stock, destruction of fish habitats, siltation, pollution and water hyacinth infestation.

Coastal and marine resources have tremendous potential for tourism industry and shelter great biodiversity. Coastal and marine fisheries resources have experienced over exploitation due in part to over fishing by foreign trawlers. Over harvesting of mangrove trees and pollution of coral reefs, beaches and other marine resources is going on in many parts of the Kenyan coast.

Forest Resources

Forests cover less than 1 % of Kenya's total land area. They conserve biological diversity, water, soil and are a major habitat for wildlife. They supply forest products and are revenue earners for individuals, communities, the government, private sector and the nation as a whole.

The thrust of Kenya's forestry policy is to reserve land for forests, protect and conserve forest resources and promote tree planting for private forestry, commercial purposes, public amenities and wildlife protection. Many people depend on forests for firewood, charcoal and building materials. Forest land is often required for agriculture, industry, human settlements and development of infrastructure.

These competing land uses have adverse environmental effects on long term sustainability of forest resources, while excisions have reduced the protected areas. The destruction of forests is threatening ecological functions. These functions include prevention of soil erosion, protection of water catchments, wildlife habitat and conservation of flora and fauna.

Forest loss has negative impacts on agriculture and tourism industry which are vital to the national economy. It also endangers the nation's water supplies, problems for major hydro electric and irrigation schemes. Excessive deforestation results in the emission of green house gases which contributes to climate change.

Now the environmental challenges have been put before the delegates in black and white. They should ask the policy makers what plans the government has to tackle the problem. The Kenya's government Sessional Paper No. 6 of 1999 on Environment and Development did set up a platform for environmental conservation but the key element to make it happen has been slow in implementation. The rhetoric that Kenya is the environmental capital of the world on the account that both the United Nations Environmental Programme (UNEP) and UN HABITAT are headquartered in Nairobi is barely sufficient. Reclamation of wetlands and riparian reserves started making newspaper headlines just the other day. What the government should do is to implement all the Multilateral Environmental Agreements (MEA) that we have ratified and at the same breath accede to the others which are of direct relevance to us.

The majority of the 5, 000 have been chosen from the grassroots level to attend the conference, they will be returning to their respective Districts during the weekend. I challenge them to take up only 3 tasks: the first is to return to their location level and explain to the population why we have no other way to fight poverty than to start by protecting the environment, secondly to organize their District Development Committees for environmental clean ups and thirdly to mobilize their members for tree planting campaigns.

We also invite the delegates to the Rand Institute for the Diploma of their lives- the Diploma in Combating Desertification, a problem of great concern. That's the Kenya We Want: An Environment Conscious Nation committed to the interest of our future generation.

Working for the Development of the Lake Victoria Basin

Background of the Lake Victoria Basin

Lake Victoria is the world's second largest freshwater lake and the largest in Africa, with a total catchment of 250,000 square kilometres, of which 68,000 km^2 is the actual Lake surface. Located in the upper reaches of the Nile River Basin, the lake waters are shared by the three East African Countries of Kenya (6%), Uganda (43%) and Tanzania (51%). Rwanda and Burundi are a part of the upper watershed that drains into Lake Victoria through the Kagera River and between them, occupy about 18% of the Lake catchment.

The Lake is a major trans-boundary natural resource that is heavily utilized by its bordering countries for fisheries, transportation, tourism, water supply and waste disposal. The Nile Basin outflow is an extremely important freshwater resource for the countries of Uganda, Sudan and Egypt.

The Lake Victoria Basin supports an estimated population of 35 million people with large concentrations along the lake edge and within the Kagera River Basin, which is shared by Burundi, Rwanda, Tanzania and Uganda. Although there are a few large cities such as Kampala, Kisumu and Mwanza, most of the population lives in rural villages and small towns. However, the region has experienced a process of rapid urbanization over the recent past with the towns, many of which are concentrated along the lake edge, growing at rates far in excess of the regional average of 3% per year. The urbanization process has been accelerating under the impact of several factors, including rural poverty, land pressures and lack of job opportunities in the rural areas.

The economy of the region is characterized by a heavy dependence on the fisheries resources of Lake Victoria, which accounts for over 25% of the Region's GDP. Other important sectors include agriculture, agro-processing, tourism, and small scale manufacturing. The Lake Victoria Basin supports one of the densiest and poorest populations in the world with population densities of over 100 persons per square kilometre. Average per capita annual income is estimated to be less than US$270, which is about 40% of the average per capita income in Sub-Saharan Africa. The problems of human poverty and unemployment are widespread, and are compounded by the rapid increase in population, the ongoing public health challenges posed by the high incidence of HIV/AIDS and malaria, unplanned urbanization and environmental degradation.

For the past 30 years, Lake Victoria has been under considerable environmental pressure from a variety of interlinked human activities, including over-fishing, destructive fishing practices, pollution from human and industrial activities, siltation from the erosion of deforested watersheds and enhanced urban runoff with high sediment loads and large volumes of waste products. The sources of pollution are many, and include, untreated sewage, human and animal waste discharged into rivers and drainage channels, maritime transport waste and direct contamination of lake water by human activities on the shore line. The cumulative impact of these activities are now clearly in evidence with Lake Victoria showing various signs of severe environmental distress, including depleted oxygen levels, eutrophication, reduced transparency and increasing levels of microbiological and chemical pollution.

The critical and multi-faceted role of the Lake as the most important economic resource, the source of much of the region's water supplies, and the ultimate sink for the increasing volumes of waste and erosion material that are generated in the catchments, has created a close linkage between environmental conditions in the Lake basin and issues of human poverty and socio-economic development in the region.

For hundreds of years, the people living around the Lake Victoria in Kenya, Tanzania, Uganda, Sudan and historically Egypt have all made their living through its fresh waters. Although a desert country, Egyptians irrigate their crops with the waters of R. Nile which the source is Lake Victoria and is now one of the leading producers of wheat.

The fresh waters of the Lake Victoria are used for fishing; both subsistence and export thereby earning the country millions of dollars in foreign exchange, industrial and domestic needs, sports and recreation, sewage and waste disposal and meeting energy needs.

The introduction of alien fish and over fishing which destroys the algae and plankton which are necessary for food, solid wastes, littering and dumping of used plastic bottles along the shores, agricultural sediments from the farms, discharge of industrial and chemical waste from the urban centres.

The volume of fish caught in the lake has tremendously decreased resulting in a situation where young fish are being netted by trawlers thereby bringing an end to the cycle and the food chain. Destructive fishing methods that catch all sizes of fish pose one of the biggest challenges to fisheries as a sector of the economy in the riparian states.

The Lake Victoria Fisheries Organization (LVFO)

The Lake Victoria Fisheries Organization (LVFO) is a regional organisation under the East African Community responsible for coordinating and managing fisheries resources of Lake Victoria. The organization was formed through a Convention signed in 1994 by the three East African Community (EAC) Partner States of Kenya, Uganda and Tanzania sharing Lake Victoria.

The objective of the LVFO is to foster cooperation among the Partner States by harmonizing national measures, developing and adopting conservation and management measures for the sustainable utilization of living resources of Lake Victoria for maximum Socio-economic Benefits.

The functions of the LVFO include to promote the proper management and optimum utilisation of fisheries and other resources of the lake; Enhance the capacity of existing fisheries institutions; Provide a forum for discussion of the impacts of initiatives on the lake; Provide for the conduct of research on the living resources of the lake and its environment; Coordinate and undertake training and extension in all aspects of fisheries; Consider and advise on the impact of introductions of non-indigenous organisms into the Lake Victoria; Serve as a clearinghouse and a data bank for information on the fisheries of the lake; and to Promote the dissemination of information.

The main organs of the LVFO are the Council of Ministers; Policy Steering Committee, Executive Committee, Fisheries Management Committee, Scientific Committee, Working Groups and, Beach Management Units and the Secretariat.

Introduction of Alien Fish Species

Although over fishing is part of the problem since

fish is concentrated on the breeding population, the once abundant reproductive adults declined tremendously with the loss of breeding stock hence their decline. Other reasons have been predation and ignorance of the need for environmental conservation of the Lake Victoria.

The 1960's witnessed the introduction of the predatory Nile Perch (Lales niloticus) in order to maximize the excessive haplachromines which were underutilized when it comes to human consumption. As it did away with the haplochromines, so did the predatory Nile Perch increase and spread to all regions of the Lake. The Nile Perch is virtually wiping out the tilapia species of fish.

The Nile Perch feeds on what is available and after it is through with the haplo-chromonines, tilapia and other species of fish, it will move to other smaller kinds of fish. The Lake Victoria is now dependent on the veracious Nile Perch which has now become dominant in the Lake Victoria. Although initially welcomed with suspicion, it has now turned to be a good earner, source of nutritious protein and also a delicacy.

It would require another article to write on the consequence of the Nile Perch but just to sum up, the death of the fish that feed on algae and detritus has resulted in deoxygenation leading to death of other fish species.

The refrigerated trucks have greatly improved the consumption for export and the loss arising from spoilage has been reduced. The traditional canoes are still in use although at much lower intervals. The problem is that some of the trawlers and motorized speed boats are in deplorable state thereby spilling oil and discharging dark smoke at the Lake. There is also use of mosquito repellants to attract fish which is catastrophic to the lake as the repellants later dissolve in water leading to continued pollution.

The Water Hyacinth (*Eichhornia Crassipes*) was introduced into the Lake in the 1990's. the leafy weed has extensively affected the beaches in the three riparian states with Kenya the worst hit. There is practically no movement of commuter transport along the shores.

The Rand Institute is in the process of preparing a comprehensive research paper on the threats of the weed to be released at a later date. In brief, they include the inhibition of plankton because they inhibit the penetration of light, the change of direction of fish flow, alteration of water quality and the destruction of breeding grounds of the fish.

The effect of the introduction of insects that feed on the weeds has been slow. What is needed is the manual removal of the weeds and converting them into income generating activities. Efforts are needed for the conservation of the lake and partnership fostered by all the stakeholders.

The Lake Victoria Basin Commission

The Lake Victoria Fisheries Organization (LVFO) came into effect through A Protocol on Sustainable Development of Lake Victoria Basin signed by the three partner states of the East African Community (Kenya, Uganda and Tanzania) on November 29, 2003, and ratified in November, 2004.

Article 3 of the Protocol outlines the fourteen areas of cooperation as they relate to conservation and sustainable utilization of the resources of the Basin. Among the areas of cooperation, they include, "the sustainable development, management and equitable utilization of water resources" and "the improvement of public health with specific reference to sanitation".

Further, Article 33 of the Protocol establishes the Lake Victoria Basin Commission has a broad range of functions, including guidance on implementation of sector projects and programmes, promotion of capacity building and institutional development and initiation and promotion of programmes that target poverty eradication.

In 2005, the EAC Secretariat published its "Vision and Strategy Framework for Management and Development of Lake Victoria Basin". This document, which was developed through a highly consultative process, essentially establishes a shared vision and a long term strategic plan for the sustainable management and development of the resources of the Lake Victoria Basin. The Framework outlines sector strategies in five policy areas, Ecosystems , Natural Resources and Environment; Production and Income Generation; Living Conditions, Poverty and Quality of Life; Population and Demography, and Governance, Institutions and Policies.

Lake Basin Development Authority

The Lake Basin Development Authority was established through the Lake Basin Development Authority Act Cap 442 of the Laws of Kenya. The mandate of the Authority as stipulated in the statute includes to plan for the development of the area it covers and initiate project activities identified from such planning through the Government; to develop an up-to-date long range development plan for the area; to initiate studies, carry out surveys and to assess alternative demands within the area on the natural resources thereof, including agriculture, (both irrigated and rain-fed) forestry, wildlife and tourism industries, electric power generation, mining, and fishing; and to recommend economic priorities; to co-ordinate the various studies of schemes within the area such as human, water, animal, land other resources and to ensure that they are utilized to the best advantage; and to monitor the design and execution of planned projects within the Area ; to effect a programme of monitoring and evaluating the performance of projects within the area so as to improve performance and establish responsibility; to co-ordinate the present abstraction and use of natural resources, especially water, within the area and to set up an effective monitoring of such abstraction and usage; to cause and effect the construction of any works deemed necessary for the protection and utilization of the water and soils of the area.

Other includes ensuring that landowners undertake all the measures specified by the Authority to protect the water and soils; to maintain a liaison between the Government, the private sector and any other interested agencies in the matter of the development area with a view to limiting the duplication of effort; to examine the hydrological effects and the subsequent ecological changes on the development programmes and evaluate how they affect the economic activities of the persons dependent on river and lake water environment; to consider all aspects of the development of the area and its effects on the Lake inflow and outflow and to monitor the operations and provide technical reports on the operations of any agreement or other arrangements between Kenya and other states relating to the use of the waters of Lake Victoria or of the River Nile.

The supervising ministry of the LBDA is the Ministry of Regional Development and already a Strategic Plan (2005-2010) has been formulated for the Authority and identifies projects and

programmes required to meet the objectives. The capital investment required to implement the project and programmes is **Kshs. 440 billion.** From among the projects and programmes some have been identified for implementation through concept paper, pre-feasibility and feasibility studies are now require funding for detailed study and implementation.

Lake Victoria Environmental Management Project

Lake Victoria Environmental Management Project is a comprehensive regional development programme that covers the whole of Lake Victoria and its Catchment areas. It is being implemented jointly by the Republic of Kenya, the United Republic of Tanzania and the Republic of Uganda. The overall project level vision is: A stable Lake Victoria ecosystem capable of meeting demand for food, income, safe water, employment, disease free environment and a conserved biodiversity. In order to achieve this level vision, the project has the following development objectives: to maximize the sustainable benefits to riparian communities of the lake basin from using resources within the Catchment to generate food, employment, income, supply safe water and sustain a disease free environment; to conserve biodiversity and genetic resources for the benefits of both the riparian and global communities; and to harmonize national and regional management programmes in order to achieve to the maximum extent possible the reversal of environmental degradation.

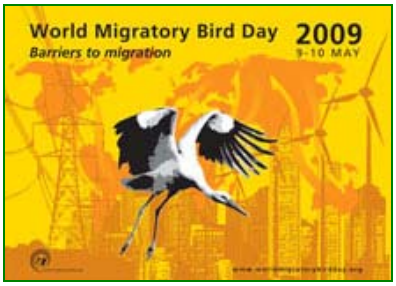
The Project therefore aims at collecting information on the environmental status of the lake, its Catchment and the practices being used by the communities living around the lake, institution establishment, capacity building, actions to deal with environmental problems of the lake and its Catchment, water hyacinth control, improving water quality and land use management, sustainable utilization of the wetlands for both their buffering capacity and the products therein. The central concern is to reduce the flow of nutrients and pollutants into the lake and reverse some of the adverse environmental developments of the past.

Financing for the Lake Victoria Basin

Financing for the rehabilitation of the Lake Victoria Basin comes from the Global Environmental Facility (GEF), World Bank and other development partners like the United Nations Development Programme (UNDP), Food and Agricultural Organization (FAO) among others. What is needed is to restore the acquatic ecosystem which provides a lifeline for not only the riparian states but for the improvement of the livelihoods of the millions whose lives depend on the Lake Victoria Basin.

**********World Migratory Bird Day 2009: 9 – 10 May: Barriers to Migration **********

World Migratory Bird Day



HIV-AIDS in the Fishing Community

As already implicit, the Lake Victoria Basin is home to an estimated 35 million people. The fish in the lake have been dwindling due to over fishing and the destruction of the marine ecosystem. Normally, fishing is an activity carried out at night not to mention the cold temperature which can lead to respiratory diseases. The scarcity of fish ahs introduced another dimension which contributes to the spread of HIV/AIDS in the lake region.

Fishermen are looked upon as exemplary members of the society because of their skills and income generating activity which can earn them at lease 15 US $ in a day. This is a relatively high income as the Lake region is surrounded by districts which have comparatively higher poverty levels than the rest of the country. Other single minded individuals have gone ahead to marry additional wives which is seen as prestige to the 'traditionalists' and to put up concubines in the same area or simply illicit affairs.

As already implicit, given that fishing is a nocturnal activity, there is long absence from home. The prolonged absence of the head of the home has led to the breakdown of discipline, financial hardship and disrespect to the authority. The womenfolk in a bid to run away from financial stress and lack of companionship that is supposed to arise from marriage, have found a way out by having other relationships. The anti HIV/AIDS '*mpango wa kando*' adverts should also be targeted to the fishermen and not just the urban dwellers.

The rise in promiscuity in some instances has led to breakdown of friendship between the fishermen and other young men in the village. They are blamed for taking advantage of the situation and preying on the wives of the fishermen and reaping where they did not sow. To make the matters worse, after spending the whole night at the lake, the fishermen spend the day in bed and 'loose the grip' on their families.

Market women get their fish directly from the fishermen at the shores of the lake. The fishmonger with the largest stock at the market will enjoy higher returns on the sale. The situation on the ground reveals that the fishermen will only sell fish to their 'customers'. No problem, only that to be a customer, you have to pay in kind.

The market women will have to be 'much more than friends' to the fishermen meaning that they will have to give out sexual favours and welcome them to their homes whenever they want. It is said that fishermen can wipe you out of business if you do not give into their demands by simply not selling the fish to a respective person.

As we go to press, it should not be assumed that all the fishermen or market women are engaged in these practices that increase the rate of HIV/AIDS in the region. What is important is the upholding of traditional African cultural values that respect and honour our women and not the moral degradation that is being witnessed due to a breakdown of taboos and social norms.

The Rand Institute calls for the involvement of traditional leaders like the 'Ker' Mzee Riaga Ogallo, and the Council of Elders for their active contribution in the fight against the two interlinked phenomenon i.e. moral and environmental degradation in the Lake Victoria Basin and the fishing communities at large. Given the movement of fishermen in transboundary waters, the rate of HIV/AIDS is likely to increase in the East African Community if no action is taken.

The Rand Institute Appreciate Your Views

We would really like to receive your feedback on the issues raised in this publication so as to help us improve on our future editions.

National Aquaculture Sector Overview of Kenya

Summary

Until six years ago, aquaculture in Kenya had stagnated at an annual production of around 1 000 tonnes. This situation was further exacerbated by poor extension services and inadequate reporting and documentation. Since 1999, however, through consistent efforts in on-farm research and training, Kenya's aquaculture production has risen and is currently likely to be almost 1 500 tonnes. The focus is now on encouraging the development of private, commercial large-scale aquaculture, which is likely to increase Kenya's production to about 12 000 tonnes in the next three years.

This development follows the efforts of the Department of Fisheries to promote aquaculture as one of the means to eradicate poverty and hunger. During the preparation of the Poverty Reduction Strategy Paper in 2000, the Government identified aquaculture development as a core activity for funding through the current Medium Term Expenditure Framework budgeting system. The last six years have been marked by aggressive research, training and private sector involvement in aquaculture. Production in real terms has doubled and is set to grow by over 1 000 percent (ten times) in the next three years. The prevailing conditions combine good prices and high demand, which are likely to boost fish production from aquaculture.

Tilapine species form about 90 percent of farmed fish in Kenya. Polyculture of the Tilapines with the North African catfish (Clarias gariepinus) is often practiced to control the prolific breeding of the former. Aquaculture takes many different forms ranging from the small hand-dug 'kitchen ponds', to fairly large earth ponds of 1 000 m2 . Dams and other impoundments of stored water are often stocked with fish and harvested periodically.

Aquaculture practices include the intensive, semi-intensive and extensive systems. The semi-intensive systems form the bulk of aquaculture production in Kenya, contributing more than 70 percent of the total production from aquaculture. Intensive systems are few, while hyper-intensive systems are being set up and are projected to contribute as much as 90 percent of all farmed fish in Kenya by both volume and value.

History and general overview

Aquaculture in Kenya follows a pattern similar to many countries in this region of Africa. It is characterized by low levels of pond production that have stagnated over the past decade. Fish farming was introduced by the colonialists for the purpose of sport fishing at the beginning of the 1900s and it evolved to static water pond culture of tilapine fish in the 1920s, later supplemented by common carp and catfish. Trout was subsequently introduced as a riverine sport fish. In order to be able to produce seed for the warm water and cold water species for stocking of rivers, dams and ponds. The colonialists set up two fish farms in 1948, the Sagana Fish Farm (for warm water species) and the Kiganjo Trout Farm (for cold water species). Mariculture was introduced in the late 1970s with the establishment of the Ngomeini Prawn Farm as a pilot project. Although fish farming in rural Kenya has a relatively long history dating back to the 1920s, it was only made popular in the 1960s through the 'Eat More Fish' campaign. However, no spectacular progress has been achieved in this sub-sector since its introduction.

Following the campaigns of the post-independence era outlined above (Kenya achieved independence in December 1963, and was established as a republic in December 1964) the number of fish farmers increased considerably to over 20 000, but production only rose from 900 tonnes in 1980, to 1 080 tonnes in 1985 and to 1 012 tonnes in 2003. Since then it has maintained this level.

Aquaculture takes many different forms ranging from the small hand-dug 'kitchen ponds' to fairly large earth ponds of 1 000 m2 . Dams and other impoundments used for storing water are often stocked with fish and harvested periodically. Intensive commercial fish culture has been attempted at the Baobab Farm at Mombasa using circular concrete ponds and raceways. Cage culture, on the other hand, is being attempted along the shores of Lake Victoria and in some dams in Central Kenya with some degree of success.

Human resources

In Kenya the number of full-time employees in aquaculture is 400. The work of extension is performed mainly by the staff of the Fisheries Department (Fisheries Officers, Assistant Fisheries Officers, Fisheries Assistants and Fish Scouts). The Lake Basin Development Authority, a semi-public organization, also has fisheries field staff who are answerable to a Technical Officer. Although thinly spread along the Lake Victoria Basin, they are better trained than other extension staff. The Kenya Marine and Fisheries Research Institute has opened up outpost stations for conducting aquaculture research and offering limited services to fish farmers. Universities such as Moi University, which has a Department of Fisheries, also offer technical assistance to farmers.

According to the current data available there are 7 790 fish farmers who are owners of aquaculture production units (Fisheries Department, 2003). The actual numbers benefiting from aquaculture will only be available on completion of the national aquaculture inventory which is being carried out by the Fisheries Department, and which includes as one of its parameters the number of household members.

Cultured species

Tilapine species form about 90 percent of farmed fish in Kenya. Polyculture of the Tilapines with the North African catfish (*Clarias gariepinus*) is often done to control the prolific breeding of the former. Some exotic species, including the common carp (*Cyprinus carpio*), rainbow trout (*Oncorhynchus mykiss*) and largemouth bass (*Micropterus salmoides*), have been introduced in Kenya for aquaculture purposes.

The rainbow trout was introduced in Kenya during colonial rule mainly for sport fishing. It has become quite important in terms of value, and a kg costs 300-1 200 Kenyan shillings or Kshs (i.e. US$ 4-16) depending on where it is sold. The common carp was also introduced during the colonial period, but is not favoured by the market.

The introduction of genetically modified species is still very contentious, but the Fisheries Department is exploring ways of developing genetically improved species by using the endemic strains available.

Practices/systems of culture

The three major aquaculture systems practiced are the intensive, semi-intensive and extensive. Extensive systems utilise the lowest management levels in aquaculture with very little or no input being directed into production. Fish are stocked in floating cages, earthen ponds and other water impoundments and left to fend for themselves. These systems are highly dependent on the natural productivity and the physical conditions of the water. The stocking densities therefore depend on the natural carrying capacity of the environment. These systems are characterized by low stocking densities and thus low yields.

Extensive culture in cages is mainly done in lakes, rivers, dams and water reservoirs. The fish depend on the organic matter suspended in the water flowing through the cages. The stocking densities in the cages also depend

on the natural productivity of the water. The main cultured species are *Oreochromis niloticus* , *Clarias gariepinus and Cyprinus carpio* . This system has not been well documented, but it is estimated that production ranges between 500 and 1 500 kg/ha/year, contributing 10 percent or more to the total aquaculture production in Kenya.

Semi-intensive systems, mostly producing Nile tilapia, have been the major contributor to aquaculture in Kenya, with an average production of about 3 tonnes/ha, contributing more than 70 percent of the total aquaculture production. These systems form the bulk of aquaculture production in Kenya. Earthen ponds and cages are used as holding units for fish culture. The ponds are fertilized using both chemical and organic fertilizers in varying proportions to enhance natural productivity. Exogenous feeding using cereal bran and other locally available feeds is done to supplement pond productivity. Polyculture of Oreochromis niloticus , Clarias gariepinus and Cyprinus carpio is practiced with various combinations of species. Production in these systems ranges between 1 000 and 2 500 kg/ha/year.

Intensive aquaculture is largely used for rainbow trout raceway culture. This has supported the tourism industry as it is considered rather a luxury and is supplied to hotels catering largely to tourists. The contribution of this fish is therefore higher by monetary value than by weight. Other intensive practices involve the use of various types of tanks, and sometimes floating cages, as holding units. In all these systems, more fish are produced per unit area by complementing or substituting the natural productivity in the culture units by exogenous feeding, aeration and both mechanical and bio-filtration where necessary. There are very few such operations in the country. Production in these systems ranges from 10 000 to 80 000 kg/ha/year depending on the management level employed.

Hyper-intensive tilapia culture has already begun through cage culture and is about to be started in ponds as well. This system will soon contribute as much as 90 percent of all farmed fish in Kenya by both volume and value.

Production

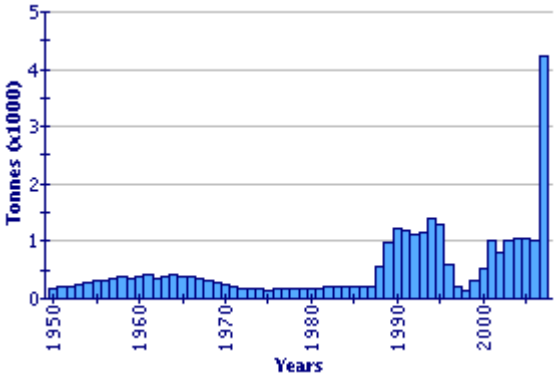
In 2003 total production of the three main fish species farmed in Kenya (Nile tilapia, rainbow trout and North African catfish) amounted to 948 tonnes. The value of production for 2003 came to US$ 2 153 000.

There are also a few other species such as Redbelly tilapia (Tilapia zilii), goldfish (Carassius auratus) and common carp (Cyprinus carpio), but their production is currently minimal.

The graph below shows total aquaculture production in Kenya according to FAO statistics:

Reported aquaculture production in Kenya (from 1950)

(Fao Fishery Statistic)



(Source: FAO Fishery Statistics, Aquaculture production)

Market and trade

The domestic market for farmed fish is quite promising. Prices are as high as Kshs 140/US$ 1.86 per kg in Eldoret and other parts of the country and there is consumer

awareness of the health benefits of eating fish as well as quality assurance of farmed fish. This combination of good prices and high demand becomes a real boost for aquaculture. Currently prices are getting even better than those on the world market for whole tilapia. Almost all major towns in Kenya where aquaculture is practiced in the surrounding areas constitute an assured market. This now includes most towns in Western, Central, Eastern, Rift Valley, Coast, Nairobi and Nyanza provinces. The market for food fish is still mainly confined to whole fish except for North African catfish fillet for which there is a high demand in some parts of the Central Province. The distribution chain is mostly short, characterized by farm-gate pricing, although lately there are increasing numbers of middlemen, especially in the fast-growing bait fish market for catfish fingerlings. Prices in the bait market vary widely from Kshs 3/US$ 0.04 from fish farmers to as much as ksh10/US$ 0.13 paid by Nile perch longline fishermen.

There has been informal export of both bait fish and ornamental fish to Uganda. There is currently no system of labelling or certification of aquaculture products, but the department has started the process of developing aquaculture legislation.

Contribution to the economy

Aquaculture has lately become a source of healthy animal protein in many parts of Kenya. It has now spread to parts of the North Rift, Central and Eastern Provinces, which initially were not fish growing areas. A number of fish farmers who were farming at subsistence level have turned into small-scale commercial fish farmers earning as much as Kshs 450 000 (US$ 6 000) per acre of water surface. Some of the commercial farmers who are starting production want to produce both for the local and export markets. Thus, it is likely that in the next three years aquaculture will make a significant contribution to both food security and foreign exchange earnings in Kenya.

The main aquaculture activities practiced by poor households in inland areas include small-scale farming of tilapia. Coastal aquaculture has yet to take off.

Institutional framework

The government strategy advocates a paradigm shift in the roles of government and the private sector in aquaculture. This finds expression in all major policy documents of the government of Kenya, such as the PRSP (Poverty Reduction Strategy Paper, 2001), KRDS (Kenya Rural Development Strategy), ERS - W&E (Economic Recovery Strategy for Wealth and Employment Creation, 2003) and SRA (Strategy for Revitalising Agriculture).

Some of the measures that the Government is planning in order to support aquaculture in both public and private sector initiatives are: Providing basic infrastructure for aquaculture development e.g. roads, electricity to fish farming areas, water, schools, hospitals and telecommunication and radio network systems; Creating a legal framework and policies for aquaculture development; Encouraging research and development for aquaculture; Providing land for aquaculture development; Framing and implementing policies for commercialization and privatization of activities in the fisheries sub sector; Involving the communities and other stakeholders in the process of policy formulation and implementation; Encouraging the private sector to drive the growth of the aquaculture sector; Creating private-public partnerships in service provision through dialogue and joint programmes.

The governing regulations

The main regulation governing aquaculture at the moment is the Fisheries Act (cap 378), which is still very general and only deals with the transfer of one species from one catchment area to another. The aquaculture

legislation, as distinct from the more general Fisheries Act, is still in its initial stages of drafting.

Applied research, education and training

Research priorities in Kenya are demand driven. The role of the Government is to support applied and farmer-participatory research directed at small- and medium-scale commercial farmers; ensure that research is responsive to the needs of farmers; and develop methods whereby farmers who own large-scale, capital intensive systems have access to Government research facilities and scientists on a contract basis.

The role of non-governmental institutions is to fund research, disseminate research results when appropriate, evaluate research results and contribute towards setting research agendas. On-farm participatory research is practiced through government and donor participation.

The major Government Aquaculture Research Institutions are: Sagana Fish Farm at Sagana, Kirinyaga District, Central Province; Kiganjo Trout Farm at Sagana, Nyeri District, Central Province; Moi University, Department of Fisheries, Eldoret, Uasin Gishu District, Rift Valley Province; Kenya Marine and Fisheries Research Institute, Mombasa District, Coast Province. Moi University offers a MSc and a Ph.D degree in Fisheries with an Aquaculture option. A diploma in Aquaculture can be obtained from the Kenya Wildlife Training Institute at Naivasha. Other short courses in aquaculture are offered by the Department of Fisheries at Moi University.

Trends, issues and development

The last six years have been marked by aggressive research, training and private sector involvement in aquaculture. Production in real terms has doubled and is set to grow by over 000 percent (ten times) in the next three years. During the preparation of the Poverty Reduction Strategy Paper in 2000, the Government identified aquaculture development as a core activity for funding through the current Medium Term Expenditure Framework budgeting system.

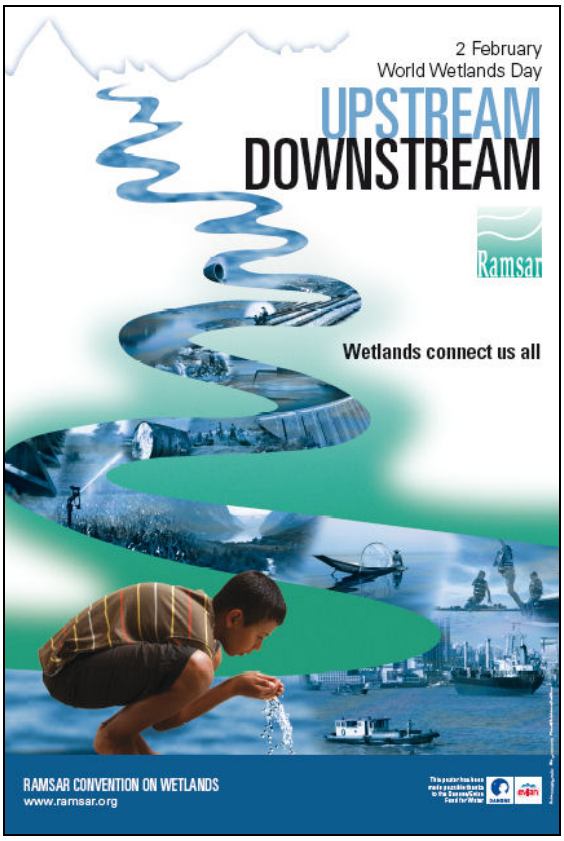
Following this development and the reorganization of government functions, aquaculture is now one of the four core functions of the Fisheries Department. The Fisheries Department has been at the forefront of policy for diversifying fisheries resource production. Measures include maintaining closed seasons and encouraging fish farming as an alternative to ensure sustainable management of such sensitive fisheries such as those of lakes Victoria and Naivasha. Lake Victoria basin is projected to contribute 90 percent of all farmed fish in Kenya, a trend that seems strange at present, as its contribution has so far been the smallest. Predicted trends on diversification and expansion are based on expectations of output from many private farms that are still in the initial stages of production. Furthermore, the recent demand of fish in the EU and even in West African countries has promoted the urge to start large-scale commercial fish farming in Kenya given that the infrastructure is being improved.

The conditions necessary for fish farming are readily available in Kenya. The technical feasibility of fish farming in the wide range of environmental conditions present in Kenya is being researched. Kenya can be divided into four climatic zones for the purposes of establishing the suitability of fish farming, based on water, temperature and fish species as follows: Western Kenya; the Highlands; the Arid and Semi Arid lands of North and Eastern Kenya; and the Coastal area. Although the recommended initiatives for enhancing farm fish production to supplement the output from capture fisheries are yet to be implemented, culture farm trials have been undertaken with many freshwater and salt water species. Kenya has a good base on which to expand its

aquaculture output. Several possible activities that could harness this potential include: culture of food fish, shellfish and seaweed, fish culture for sport, raising of ornamental specimens for export, the recycling of organic waste and the production of industrial fish products such as fish meal and fertilizers.

Bibliography

Balarin, J.D. 1985. Reviews for aquaculture development in Africa: Kenya. FAO Fish Circ., (770.7):96 p.
Central Bureau of Statistics & Ministry of Planning and National Development. 2002a. The 1999 Population and Housing Census. Vol I. Government of Kenya.
Central Bureau of Statistics & Ministry of Planning and National Development. 2002b. The 1999 Population and Housing Census. The Popular Report. Government of Kenya.
Central Bureau of Statistics & Ministry of Planning and National Development. 2004. Statistical Abstract. Government of Kenya.
Central Bureau of Statistics & Ministry of Planning and National Development. 2005.Economic Survey. Government of Kenya.
Department of Fisheries. 2000. Aquaculture Annual Report - 2000. Government of Kenya.
Department of Fisheries. 2001. Aquaculture Annual Report - 2001. Government of Kenya.
Department of Fisheries. 2002. Aquaculture Annual Report - 2002. Government of Kenya.
Department of Fisheries. 2003. Aquaculture Annual Report - 2003. Government of Kenya.
FAO. 2005. Aquaculture production, 2004. Year book of Fishery Statistics - Vol.96/2. Food and Agriculture organization of the United Nations, Rome, Italy.
Ministry of Agriculture. 2004. Strategic Plan of the Ministry of Agriculture (2005-2009) - Final Report. Government of Kenya.
Ministry of Finance & National Planning. 2002. Development Plan 2002-2008. Government of Kenya.



References, additional resources and further information can be found below:

http://www.ramsar.org , www.ramsar.org/wwd/9/wwd2009_intro.htm , www.eac.int , www.lvfo.org , www.worldmigratorybirdday.org

The Ramsar Convention on Wetlands: Has it Made a Difference? By Michael Bowman.
Yearbook of International Co-operation on Environment and Development: 2002/2003 by the Fridtjof Nansen Institute: Lake Victoria Basin Commission; Terms of Reference for Consulting Services for a Project to Prepare Investment Plans for 15 Secondary Urban Centres under the Lake Victoria Basin Water and Sanitation Initiative: August 2008: National Report on the Implementation of the Ramsar Convention on Wetlands to the COP 10 at Changwon, Korea. Changwon Declaration on Human Well-Being and Wetlands. Resolution X. 8 on the Conventions Programme on CEPA 2009-2015. Sessional Paper No. 6 of 1999 on Environment and Development. East African Community Mediation Agreement Act (CAP 4). Lake Victoria: Under Pressure from Ecological Changes by Stephen V. Opiyo.

THE RAND INSTITUTE FOR POLICY AND EDUCATION

(INCORPORATING THE MDGs STUDY CENTRE)

The Rand Institute for Policy and Education is an independent public policy research center which promotes the view that innovation, culture and ecology are an integral part of environment sustainability as well as being crucial to meet the Millennium Development Goals (MDGs).The Rand Institute carries out its activities through advocacy, training and information dissemination.

Diploma Course in Combating Desertification

The Diploma Course in Combating Desertification consists of ten modules to be completed within 9 months in order to qualify for a diploma. It is being conducted in English through Information Communication Technologies (ICT) by e-Learning which has emerged as an innovative approach.

Course Objectives: To bring to the attention of the various stakeholders the serious effects of desertification and land degradation ; to improve the visibility of the United Nations Convention to Combat Desertification (UNCCD); to explain the contents, objectives and to support the implementation of the UNCCD; to disseminate information and awareness-raising on the theme of desertification; to encourage participants to take action to combat desertification through the promotion of sustainable land use and management; to present success stories in the struggle against desertification and how the positive experiences can be replicated in other parts of the world.

Target Group: Government officials in environment related Ministries like Environment & Natural Resource, Forestry and Wildlife, Fisheries, Foreign Affairs, Agriculture, Regional Development, Attorney General Chambers e.t.c. ; statutory bodies like the Forestry Service, environment regulatory agencies, environment negotiators; Policy makers and Parliamentarians in the multilateral environment treaty formulation and implementation; In-service employees in forestry sector; NGO employees in related fields; academics; students of law and sustainable development; Members of environment clubs and societies; Anyone interested in acquiring a detailed knowledge in Combating Desertification

Charges: The course is offered upon payment of standard fee of Kshs. 32, 000 for the entire programme or 500 US $ for those paying in international currency. We also accept payment by installments.

The application forms are available for interested participants. The registration process is currently in progress and kindly get in touch with us to obtain the forms which should be accompanied with a motivation letter. Successful participants will receive a Diploma with the course contents printed on the back and it is mailed through the post office.

For more information please:

The Registrar
Call: 254 020 2166903, 0721 528272, 0733 528272
P.O Box 389, 00200, CSQ, Nairobi, Kenya
Email: rand.institute@gmail.com ; Website www.randinstitute.webs.com

2ND World Congress of Agroforestry

The World Congress of Agroforestry 2009 will take place in Nairobi on the 23 – 28 August 2009 and will be hosted by the United Nations Environmental Program, the World Agroforestry Centre (ICRAF) and the University of Florida.

Background

Agroforestry - The Future of Global Land Use

Agroforestry first captivated the attention of the scientific community in the late 1970s. Today, Agroforestry has come of age-poised as a sustainable land use option the world over. Its potential for achieving the goals of the key global environmental conventions-Climate Change, Biodiversity, and Desertification, as well as the Millennium Development Goals-has drawn the interest of scientists and policy makers alike.

Scientists are developing effective and inexpensive methods to enable major carbon investment flows to smallholders, and governments and development agencies worldwide are taking notice. Emerging partnerships between institutions engaged in agroforestry and biological conservation are building on their respective strengths to tackle the challenges of protecting biodiversity. Indeed the role agroforestry plays in tackling global environmental problems, and poverty, has never been more widely appreciated.

It is against the backdrop of these exciting developments that we announce the 2nd World Congress of Agroforestry, scheduled for 23-28 August 2009, in Nairobi, Kenya. A country widely recognized for its rich biodiversity, Kenya is well suited to host this important Congress because of its tree planting culture. The Central Highlands are dominated by agroforestry systems, including an expanding smallholder dairy sector based on utilization of fodder trees on farms. These unique agroforestry systems will be the subject of several field trips to be integrated into the overall Congress Programme.

The 1st World Congress of Agroforestry, held in 2004 in Florida, USA provided a global forum for agroforestry professionals to share knowledge, experiences, and ideas, and to plan future strategies in agroforestry research, education & training, and development. The 2nd World Congress of Agroforestry will strengthen the momentum of knowledge-sharing and will further underpin the enormous crescendo of interest in agroforestry that is building up worldwide.

Themes

- Food Security and Livelihoods
- Conservation and Rehabilitation of Natural Resources
- Policies and Institutions

Registration for WCA2009 Congress Participants

All fees are in US dollars ($).	Early Registration (Up to 30th of April 2009)	Regular Registration (Up to 31st of July 2009)	Late/On-site Registration (After 1st of August 2009)
Regular Participant	$400	$450	$495
Student Participant*	$225	$250	$275

Contact Details:

World Agroforestry Centre, United Nations Avenue, Gigiri, P.O Box 30677-00100 Nairobi, Kenya. Email : icraf@cgiar.org Website : http://www.worldagroforestry.org/wca2009/contact

The Rand Institute Needs You

The Rand Institute is a vibrant organization which can do more with people like you, who appreciate and are convinced that we can have a better world and restore our environment through innovation, culture and ecology. We are accepting applications for Environment; International Law and Policy; and Information Technology interns.

COMMITMENT LEVELS

- The positions are unpaid but promising experience, exposure and contribution to the environmental agenda;
- Flexible and convenient hours;
- The Rand Institute office is based in Nairobi;
- The positions can be "virtual" so contribution is welcomed from all over the world;
- The positions are part time to full time;
- International students are particularly encouraged to apply;
- Successful applicants are required to adhere to the Rand Institute's Constitution;

Environment interns:

Duties: Research on topical environment issues especially on atmosphere, biodiversity, hazardous wastes, marine environment, nature conservation and terrestrial living resources, transboundary watercourses, urbanization and renewable energy, provide regular updates, producing topical and well researched features for our publications which are targeted to our stakeholders as defined by the Rand Institute's Charter, briefing notes, press releases and policy papers.

International Law and Policy Interns:

Duties: Research on multilateral environment agreements, legal research on topical environment issues, draft briefing papers, writing on international environment law and co operation, FAQs, amicus briefs, and other articles on legal matters regarding treaty formulation.

Information Technology Interns:

Duties: Maintain our website, assist in building and maintaining online and offline databases, software applications, and other technology related issues. Competencies include experience in computer programming, building and maintaining databases, web applications, and server and network administration. College students are encouraged to apply.

SKILLS REQUIRED FOR THE ABOVE POSITIONS

Analytical, writing, oral presentation, organization and computer skills; ability to work with minimum supervision; ability to identify priority activities and collaborate with others to deliver achieveable results; possess strong knowledge of current development issues; applicants must be internet savvy, pro-active, creative and service oriented.

To apply, please send a letter of interest to rand.institute@gmail.com accompanied with your CV.

The Changwon Declaration on Human Well-Being and Wetlands

The Changwon Declaration is a statement and call to action from the 10th meeting of the Conference of Contracting Parties to the Ramsar Convention on Wetlands, which was held in Changwon, Republic of Korea, from 28 October to 4 November 2008.

The Conference of the Convention's Contracting Parties held its 10th meeting in Changwon, Republic of Korea, from 28 October to 4 November 2008, on the theme of "Healthy wetlands, healthy people"4, focusing on the link between human well-being and the functions of wetlands and the identification of positive actions in this regard.

The Declaration highlights positive actions for ensuring human well-being and security outcomes in the future under five priority thematic headings below, followed by two key areas of crosscutting delivery mechanisms.

Water and wetlands

The degradation and loss of wetlands is more rapid than that of other ecosystems, and this trend is accelerating, due to major changes in land use, water diversions, and infrastructure development. Access to freshwater is declining for 1-2 billion people worldwide, and this in turn negatively affects food production, human health, and economic development, and it can increase societal conflict.

There is an urgent need to improve water governance. Instead of being demand-driven, which promotes over-allocation of water, water governance should treat wetlands as our "natural water infrastructure", integral to water resource management at the scale of river basins. Continuing with "business as usual" is not an option.

Our increasing demand for, and over-use of, water jeopardizes human well-being and the environment. Access to safe water, human health, food production, economic development and geopolitical stability are made less secure by the degradation of wetlands driven by the rapidly widening gap between water demand and supply.

There is often not enough water to meet our direct human needs and to maintain the wetlands we need. Even with current attempts to maintain water flows for ecosystems, the capacity of wetlands to continue to deliver benefits to people and biodiversity, including clean and reliable water supplies, is declining. Actions to support water allocation to ecosystems, such as environmental flows, placing upper limits on water allocations (water 'caps'), and new water management legislation, must be strengthened.

To close this "water gap", we need to:

• use our available water more efficiently;
• stop our wetlands from becoming degraded or lost – based on clearly recognizing that we all depend on healthy wetlands for our water security, and that wetland services are currently being lost at a faster rate than in any other ecosystem;
• restore our wetlands that are already degraded – this offers us an efficient and cost-effective means of increasing ground and surface water storage, improving water quality, sustaining agriculture and fisheries, and protecting biodiversity.
• wisely manage and protect our wetlands – by always ensuring that they have enough water for them to continue to be the source of the quantity and quality of the water we need for food production, drinking water and sanitation. Failure to do so makes our water problems worse, since wetlands are the only source of water to which we have easy access.

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The Rand Institute for Policy and Education P.O Box 389, 00200, CSQ, Nairobi, Kenya Tel: 020 2166903, 0721 528272 / 0733 528272, 0751 528272, 0773 258795 E-mail: wilsonrading@yahoo.com

The Rand Institute for Policy and Education popularly known as the Rand Institute formerly 'The Uranga Entity Institute' an independent public policy research centre which promotes the view that innovation, culture and ecology are an integral part of environment sustainability as well as being crucial to meet the United Nations Millennium Development Goals (MDGs). The Rand Institute carries out its activities through advocacy, training, policy formulation, legal advisory and information dissemination.

SAVE THE DATE!

WORLD MIGRATORY BIRD DAY 2009: 9TH – 10TH MAY 2009

THEME: BARRIERS TO MIGRATION

TIME: 9: 00 A.M

Taking Control of Water Basins & Wetlands: What We Can Do

Managing water at the basin level requires public participation, information supply, consultation and active involvement.

1. Good involvement takes time, start early!

2. Develop and share a sense of ownership for the river basin.

3. Work to build and maintain trust with your partners.

4. Undertake "mapping" of stakeholders to find out more about them and their interests.

5. Learning from mistakes is as important as sharing successes.

6. Listening is as important as talking.

7. Be passionate for your cause, passion persuades.

8. Work with each other and build a common vision for your basin, to put the management plan into context.

9. True partnership leads to shared responsibility and decision making for shared actions.

10. Where cultures and traditions vary, agree key messages and adapt to their needs.

Green in Mind, Green in Soul, Green in Life
Green Approaches for Sustainable Development