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UNIDO Green Industry Newsletter

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FEATURE Water Management

UNITED NATIONS
INDUSTRIAL DEVELOPMENT ORGANIZATION

Message from the Director

While the oceans provide valuable resources and environmental services to our planet and its inhabitants the world's population and all terrestrial ecosystems have to rely on fresh water which accounts for less than one percent of the world's water. The oceans as well as fresh water resources are exposed to ever increasing pressures. This is why there is a strong need to balance the various demands with available supplies in terms of quality and quantity. In other words, sustainable water management is a must.

For industry, it requires a comprehensive and consistent integration of improved water supply with enhanced demand management to increase water use efficiency of industrial processes, and lower pollutant loads of effluents discharged to the environment. Pilot projects in many countries have proved that increased water efficiency in industries will increase productivity and competitiveness, and reduce production costs at the same time.

The immediate plan of action should be for countries and industries to make the implementation of water efficient technologies and measures a key priority in their industrial development policies. There are plenty of available strategies, concepts and plans, but concrete actions are missing.

UNIDO's Transfer of Environmentally Sound Technology (TEST) approach provides a perfect tool for such concrete clean-up activities.

I invite you to read more about how UNIDO works on protecting water resources for future generations.

Heinz Leuenberger
Director, Environmental Management Branch, UNIDO

UNIDO FOCUS

The Water Management Unit

UNIDO's Water Management Unit provides services for the transfer of best available environmentally sound technologies and environmental practices to improve water productivity in industry and prevent discharge of industrial effluents into international waters (rivers, lakes, wetlands and coastal areas) thereby protecting water resources for future generations.

We work to:

- reduce the degradation of transboundary river basins and the marine and coastal environments by offering best practice strategies, building capacity, and strategic partnerships
- improve water productivity through the Transfer of Environmentally Sound Technologies (TEST) approach and better water and resource management, as well as through supporting sound management of resources use at priority industrial hot spots, to minimize use, maximize productivity, and promote zero discharge, and by demonstrating best practices, applying clean technologies
- protect the environment and people's health from toxic pollutants through the introduction of clean technologies and policy reforms to minimize the use and discharges of toxic substances in small-scale industrial applications, and to promote the removal of toxic substances from drinking water sources in remote areas through awareness raising, capacity building, and technology transfer

SELECTED PROJECTS

The MED-TEST programme at a glance

In 2009, UNIDO launched the MED-TEST programme, a green industry initiative supported by the Global Environment Facility (GEF) and the Italian Government and designed to address industrial pollution arising from land based sources of pollution of priority hot spots identified in the Mediterranean Strategic Action Plan.

MED-TEST is a component of the "Strategic Partnership for the Mediterranean Large Marine Ecosystem" which aims to support governments in effectively implementing national strategies for reducing industrial discharges.

The MED-TEST project has an expected duration of three years and involves three pilot countries (Egypt, Morocco and Tunisia), with the potential to be extended to other countries of the region.

National Partners:

EGYPT - Egyptian Cleaner Production Centre (ENCPC)
MOROCCO -Moroccan Cleaner Production Centre (CMPP)
TUNISIA - Consortium of Technical Centres for Textile (CETTEX), Leather (CNCC) and Agro-Food industries (CTAA)

Participants of the MED-TEST Regional Training in Vienna, 27-29 April, 2009

Stopping overfishing in the Gulf of Mexico

The Gulf of Mexico Large Marine Ecosystem is shared by Cuba, Mexico and the United Stated. It is one of the most productive marine ecosystems in the world, and an important global reservoir of biodiversity. However, this high productivity is at risk from a range of anthropogenic threats that include excessive fishing, destruction of critical coastal and marine habitats, and nutrient-enrichment resulting in a so-called "dead zone" of over 18,000 km2 – one of the largest hypoxic zones in the world. Additionally, this Large Marine Ecosystem is the focus of extensive oil and gas production, as well as a rapidly increasing tourism industry.

Many stocks in the Gulf of Mexico are overfished, or are close to their maximum yield. Intensive fishing, the primary force driving biomass changes in the Gulf of Mexico Large Marine Ecosystem, is compounded by two other significant factors. Habitat modification, including loss of critical habitats and connectivity, resulting from poorly planned growth in the Gulf of Mexico coastal and urban areas, translates into a trend of urban growth at the expense of estuaries, marshes, sea grasses, coral reefs, mangroves and other vital ecotones.

The GEF has provided a US$ 5 million grant to a project which aims to secure the global and regional benefits through an ecosystem-based management framework, allowing the countries to strengthen the management of the Gulf of Mexico living resources, and address land-based and marine pollution, including the reduction of nutrient loads that contribute to hypoxic zones in the region. The participating countries - Mexico and the United States - have committed US$ 100 million in project co-financing over a four-year timeframe.

Linking the TEST programme and the MDGs

Honduras: Water and sanitation under economic governance

In Honduras, water and sanitation problems have been endemic for years. The situation was exacerbated after the country was severely hit by hurricane Mitch in 2005.

With the assistance of the Spanish fund for the Millennium Development Goals, and under the leadership of UNICEF and UNDP, UNIDO, ECLAC, FAO, ILO, and WHO developed an integrated concept for each agency to bring its expertise to improve the water situation in the country.

UNIDO is working in the industrial capital of Honduras where the major river, the Rio Blanco, suffers from regular high pollutant charge, which prevents local population access to water and fish stock. UNIDO is introducing its TEST methodology to the three largest industrial polluters (fish farm, chicken slaughterhouse and textile company).

Millenium objective within reach: more effective water and sanitation for Mexico

Following a similar approach, under the leadership of ECLAC and UNDP, UNIDO, FAO, UNESCO, UN Habitat, UNODC and WHO have come together to address the water problem in the south of Mexico.

Three municipalities in each of the three southern states (Chiapas, Tabasco and Veracruz) will participate in the project. UNIDO's role will be to assist local authorities in improving their database of industries using and releasing water. The TEST concept will also be introduced in a selected number of these industries.

The virtual water trade in industry and manufacturing

The concept of Virtual Water was coined in London in 1994. The idea is derived from the analysis by Gideon Fishelson, which pointed out that exporting water in water intensive crops did not make much sense.

Virtual water is defined as water embedded in commodities. In the case of agriculture, for example, a grain crop transpires about one cubic meter of water in order to produce one kilogram of grain. So, importing one kilogram of grain is approximately equivalent to importing one cubic meter of water.

Virtual water flows, the flows of water embedded in commodities, have relevance to water stress, water scarcity, and food security, as they reduce the need to use water for food production in importing countries and increase water use in exporting countries.

The same concept of the virtual water trade described above for the case of crops and food products applies in relation to manufactured products, where a particular finished product represents the volume of water used to produce it. This can be calculated as m3 per ton of product, or as m3 per dollar of added value.

By looking at the imports and exports of each type of product, it is possible to calculate the virtual water flows into and out of the region that this trade represents.

One can also calculate the industrial water productivity of various products and sectors, in terms of the industrial value added per unit of water used.

In water-scarce regions, it makes sense to focus on the manufacture of products that use little water in the manufacturing process, and to export products with high water productivity. This minimizes the amount of virtual water that is exported.

On the other hand, water-intensive products and products with low water productivity, such as aluminum and beer, should be imported into water-scarce regions, as this represents a way of indirectly importing water.

Global inventory on industrial polluted sites

Despite the increasing efforts applied over the past two decades into improving environmental institutions and systems in developing countries, serious gaps remain in addressing problems on the ground. Toxic pollution in developing countries continues to be a major risk to human health. While rapid growth continues to provide wealth and opportunities to increasing numbers in the developing world, unregulated pollution continues to create serious problems in many places. The adverse impacts of toxic pollution on children are particularly severe.

UNIDO, with the support from the European Commission and in collaboration with the Blacksmith Institute, is implementing a project aimed at helping communities heavily impacted by legacy toxic pollution.

Obsolete pesticide stocks (UNIDO, Niger 2002)

A clean coastline for Sub-Saharan Africa

Cameroon, Gambia, Ghana, Kenya, Mozambique, Nigeria, Senegal, Seychelles, Tanzania

The marine and coastal resources along the 48,000 km of Sub-Saharan African coastline are under threat from various development-related activities. Although tourism is often considered the 'environmentally friendly' alternative to more exploitative livelihood options, it also brings with it its share of pollution, contamination and degradation.

Based on the identified issues and proposals of the 2002 Johannesburg World Summit on Sustainable Development and the thematic group on coastal, marine and freshwater ecosystems of the New Partnership for Africa's Development (NEPAD), a new project has been developed by UNIDO, with inputs from UNWTO. The project will use best practices and strategies to help reduce the degradation of marine and coastal environments of transboundary significance. This will help enhance sustainable tourism practices. The project will also contribute to the sustainable management of four Large Marine Ecosystems in Africa. Coastal tourism in Sub-Saharan Africa already contributes to a significant extent to export services and the GDP in some countries of the region, and yet there is still immense scope for further growth.

Measures for a healthy marine ecosystem

The shared transboundary waters off the coast of western Africa are defined by the Guinea Current Large Marine Ecosystem (GCLME), which stretches from the coast of Guinea Bissau to Angola, covering sixteen countries (Angola, Benin, Cameroon, Congo, Democratic Republic of the Congo, Côte d'Ivoire, Gabon, Ghana, Equatorial Guinea, Guinea, Guinea-Bissau, Liberia, Nigeria, Sao Tome and Principe, Sierra Leone and Togo).

Characterized by distinctive bathymetry, hydrography, chemistry and trophodynamics, the GCLME is ranked among the most productive coastal and offshore waters in the world. It not only has rich fishery resources, oil and gas reserves, precious minerals, and a high potential for tourism, but is also an important reservoir of marine biological diversity of global significance.

Over-exploitation of fisheries, pollution from domestic and industry sources, poorly planned and managed coastal developments, as well as near-shore activities, result in a rapid degradation of vulnerable coastal and offshore habitats – factors that put the economies and health of the public at risk.

To reverse the trends in natural resource degradation, the UNIDO-executed GCLME project supports the sixteen countries in:

- restoring depleted fisheries
- reducing land and sea-based pollution
- restoring degraded habitats

To achieve these goals and to secure the sustainable development of this important ecosystem, the Global Environment Facility (GEF) has approved a grant of US$ 21 million in support of this project.

Avoiding "dead zones" by engaging the agribusiness industry

The 2003 Global Environment Outlook Yearbook and the Global International Waters Assessments report that marine "dead zones" have become increasingly more common in the world's estuaries and coastal zones, with serious impacts on local fisheries, biodiversity and ecosystem function.

While "dead zones" may be augmented by nutrient enriched inputs from a range of sources, there is direct evidence that indicates agriculture as the largest contributor. UNIDO and UNEP are proposing for the GEF funding a project that would:

- engage the agribusiness supply chain in a dialogue to form partnerships with relevant international and regional organizations, national governments and civil society organizations to reduce nutrient inputs to coastal and marine waters
- assess and synthesize current knowledge of nutrient sources, with a particular focus on agribusiness supply chain contribution and solutions
- develop integrated management guidelines, best practices, tools, technologies and strategies for the supply chain nutrient contributions
- identify partnership capacity building needs and develop training packages
- establish and implement communication and outreach strategies.

Mercury

Global pollutant needs global action

Because mercury is one of the most toxic heavy metals, actions have long been taken in many countries to remove it from industrial process and products. However, it continues to be used in and emitted from a number of sectors, the two major ones being electricity production from coal-fired power plants and artisanal gold mining. UNIDO has been implementing projects in the field of artisanal and small-scale gold mining for the past 15 years. Initial programmes in the Philippines, Tanzania and Ghana with the support from UNDP, Japan and France, led to the development of a large global pilot project financed by the GEF. The pilot project has been successfully implemented in Brazil, Indonesia, Lao PDR, Sudan, Tanzania and Zimbabwe. The success of the pilot project has placed UNIDO as the lead agency for the sector.

In the meantime, international actions to reduce mercury intoxication are being implemented. UNEP has undertook a Global Mercury Assessment, developed countries have initiated programmes to eliminate mercury from industrial process, awareness raising led to people removing their dental amalgam. During its General Conference-24, UNEP was instructed to establish a Global Mercury Partnership to bring together the main stakeholders in the five major areas of concern for this toxic metal. UNIDO was proposed as the lead agency for artisanal small-scale gold mining. This partnership will play a major role in the negotiations leading to an international agreement on mercury to be held in February 2013.

Through its activities in the artisanal gold mining and through partnership in other focal areas of the UNEP initiative (mercury in products and in wastes) UNIDO will continue to be a major actor in the mercury issue.

Copper plate amalgamation - the worst practice (UNIDO, Zimbabwe 2004)

Arsenic-free drinking water

Bangladesh

Among natural elements, arsenic is one of the most harmful. Under certain hydro-geological conditions, arsenic contained in sediments can be dissolved in groundwater and occur in a wide range of concentrations from some micrograms up to some milligrams per litre. In the alluvial and deltaic aquifer of Bangladesh and West Bengal, the concentration of arsenic in groundwater is often 300 times higher than the WHO guideline (10 µg/L).

The elevated exposure of people to arsenic began with the installation of millions of hand-pumped wells to provide rural communities access to clean drinking water and to reduce diarrhea and infant mortality caused by the utilization of surface water for human consumption. Long-term exposure to arsenic in drinking water produces a range of clinical manifestations, of which skin diseases are the most frequent. These are characterized by hyper-pigmentation of the body and limbs and a diffuse thickening of palms and soles with nodular cauliflower-like elevations. Other clinical symptoms are weakness, anemia, liver enlargement, and chronic lung disease. At a later stage, patients may develop different kind of cancers, most frequently of the skin, urinary bladder and lungs.

In order to address this issue, UNIDO, with the support of the United Nations Trust Fund for Human Security, implemented a project in two areas of Bangladesh where people have shown high level of arsenic intoxication. The project developed a strong awareness raising campaign with recurrent community workshops where information on arsenic was distributed and experience was shared. After a thorough evaluation, an innovative solution for removal of arsenic from drinking water was introduced with the active involvement of the local communities.

Through collaboration with WHO, health camps were organized to treat arsenicosis affected patients. After two years of implementation, the population of these two areas is now aware of the arsenic issue and has the capacity and means to avoid further contamination.

Simple household filters provide villages in Bangladesh with clean drinking water (UNIDO, Bangladesh 2008)

Valuating Senegal's forest ecosystems

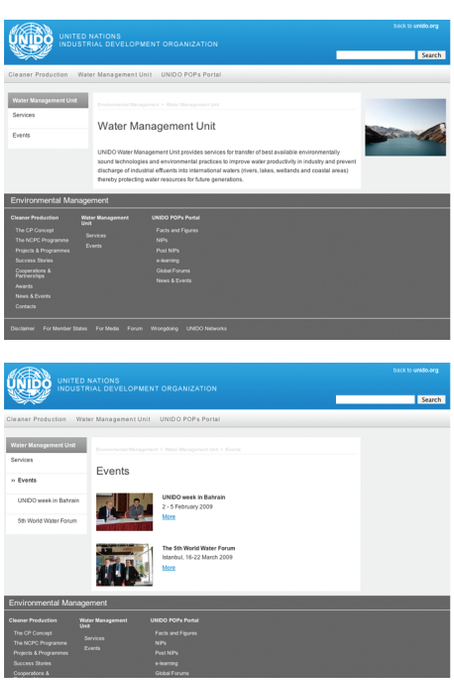
UNIDO is helping the Government of Senegal support sustainable forest management. The UNDP-Spain Millennium Development Goals Achievement Fund has availed US$ 4 million for a three-year integrated programme to be jointly implemented by UNEP, UNDP, UNIDO, IOM, FAO, WFP and UNESCO.

UNIDO will contribute through technical assistance and capacity building for the development of redistribution mechanisms, to re-inject fiscal revenues into local communities in the form of social investments, equipment and environmental infrastructures. It will also help finance means of sustainable existence (revenue generating activities linked to the preservation of nature and resources) which allow the correct functioning of ecosystems.

UNIDO TOOLS

New water management portal

For more information about the projects, please refer to our website: www.unido.org/watermanagement



Screenshots of the online portal

GLOBAL FORUM ACTIVITIES

Ecocities – how to ensure economic development and environmental protection in municipalities

Middle East and Northern Africa region

Cities use 80 % of the global resources and this unsustainable consumption combined with the associated waste generation increases the ecological challenges of the planet. This problem is particularly acute in regions where local climatic conditions already induce fragile ecosystems. In the Middle East and Northern Africa, environmental problems are particularly inflated by the arid conditions.

Because cities are the drivers of the economy, they attract large numbers of people. However, urban population typically suffers from greater levels of air and noise pollution, as well as reduced access to open space, green areas and fresh water.

Around the world, municipalities are implementing different options to deal with this problem and the good practices have to be promoted so that replication is possible. Although the concept of these different practices varies, successful ones always include the three key groups in the process: public institutions, private sector and the general public.

In October 2008, the Government of Jordan, UNIDO and USAID organized a meeting at the Dead Sea to raise awareness of regional decision makers on the options available. Some 250 participants discussed best practices in the field. They also adopted the Amman Declaration which encouraged a pro-active approach in achieving environmental sustainability, and the creation of a network of eco-cities.

UNIDO is working with partners to implement the recommendations in a selected numbers of municipalities of the region.

UNIDO week in Bahrain

Within the framework of its "Green Industry Initiative", UNIDO organized a series of activities in Manama from 2 to 5 February 2009, including a Clean Technology Forum.

The event was designed to help governments establish a platform for further dialogue, and create capacity for decision making in cleaner technology transfer, facilitate access to cleaner technologies, and establish a financial mechanism for investments in that area.

Delegates and participants of the Clean Technology Forum in Manama, 2-5 February, 2009

Did You Know?

- Artisanal and Small Scale Gold Mining (ASGM) is the source of income for 100 million people in over 60 countries
- ASGM releases over 1,000 tonnes of mercury annually to the environment
- Methylmercury intoxication leads to severe neurological damages
- Methylmercury penetrates the placental barrier, affecting the unborn
- Each energy efficient light bulb contains a few mg of mercury
- Mercury containing products often end up in landfill

Readers are invited to send their comments and opinions to:

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