Regional Seminar on Facilitating Transfer and Diffusion of Clean Technology

"*Opportunities from a Pilot Project on Wastewater Treatment in South East Asia*"

High bacteria levels found in Boracay water, environment officials allay fears

February 25, 2015 2:51pm

Tags: Boracay

The clear waters of world-famous Boracay may not necessarily be that clean, after environment officials noted a whopping rise in the level of coliform there.

While the Environmental Management Bureau in Western Visayas maintained Boracay's water is still safe to bathe in, local officials are studying steps to address the problem, GMA Iloilo reported Wednesday.

Last Feb. 21, a news release posted on the Department of Environment and Natural Resources website cited EMB-6 figures showing bacterial levels in Boracay waters significantly exceeded DENR guidelines for recreational water.

It said the EMB reported coliform bacteria levels in a drainage outlet that empties into the sea in Sitio Bulabog in Boracay exceed safe standards, reaching 47,460 most probable number (mpn) per 100 milimeter (ml).

The safe level is 1,000 mpn/100ml for waters for swimming and other human contact activities.

Also, the DENR noted coliform bacteria could also adversely affect aquatic resources, including marine life and coral reefs.

Environment Secretary Ramon Paje called on stakeholders to help maintain the good quality of

Panay News
THE NO.1 REGIONAL NEWSPAPER

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'Boracay coliform up'

February 26, 2015

A boy is skimboarding in Boracay. The water's green coloration indicates algae growth that is commonly attributed to high coliform bacteria levels. GUIJO DUEÑAS/PN FILE PHOTO

By PRINCE GOLEZ, *Manila Reporter*

MANILA — Coliform bacteria levels in the waters of the world-famous Boracay Island were reported to have elevated.

Sen. Miriam Defensor-Santiago wanted the Senate to investigate the phenomenon.

The Department of Environment and Natural Resources-Environmental Management Bureau (DENR-EMB) warned about the high coliform levels in Boracay, specifically at the Bulabog Beach.

Last Feb. 21, a news release

website cited EMB-6 figures showing bacterial levels in Boracay waters significantly exceeded DENR guidelines for recreational water.

Source: J. Locsin, 2015. GMA News

S & T WATER ENVIRONMENT INTERVENTIONS

23 April 2015

RUBY RATERTA, Ph.D.

Department of Science and Technology
PHILIPPINE COUNCIL FOR INDUSTRY, ENERGY AND
EMERGING TECHNOLOGY RESEARCH AND DEVELOPMENT

PRES. AQUINO'S PRIORITIES

ANTI-CORRUPTION / TRANSPARENT, ACCOUNTABLE, PARTICIPATORY GOVERNANCE	POVERTY REDUCTION AND EMPOWERMENT OF THE POOR	RAPID EQUITABLE & SUSTAINED ECONOMIC GROWTH	JUST, INCLUSIVE & LASTING PEACE /RULE OF LAW	INTEGRITY OF ENVIRONMENT/ CLIMATE CHANGE MITIGATION & ADAPTATION

DOST MANDATE

Provide central direction, leadership and coordination of all and technological efforts and ensure that the results there from are geared and utilized in areas of maximum economic and social benefits for the people.

DOST 'S PRIORITY PROGRAMS

1. USE S&T TO SOLVE PRESSING NATIONAL PROBLEMS	2. DEVELOP APPROPRIATE TECHNOLOGIES TO CREATE GROWTH IN THE COUNTRYSIDE	3. IMPROVE INDUSTRY COMPETI-TIVENESS	4.USE S&T TO ENHANCE GOVERNMENT AND SOCIAL SERVICES	5. ENHANCE CAPACITY IN EMERGING TECH

KEY RESULT AREAS

Poverty Reduction and Empowerment of the Poor and Vulnerable

Rapid, Inclusive and Sustained Economic Growth

Integrity of the Environment and Climate Change Adaptation and Mitigation

Key Result Areas

DOST OUTCOMES

- Innovative, Cost-effective and Appropriate Technologies
- State-of-the-art Facilities to Move up the Value Chain and Attain Global Competitiveness
- Highly Skilled and Globally Competitive S&T Human Resources
- Science-based Weather Information and Climate Change Scenarios for a Disaster and Climate Change Resilient Philippines

DOST SECTORAL Councils

- Philippine Council for Health Research and Development (PCHRD)
- Philippine Council for Industry, Energy and Emerging Technology Research and Development(PCIEERD)
- Philippine Council for Agriculture, Aquatic, and Natural Resources Research and Development (PCAARRD)

- **SUPPORT FOR R&D**
- **HUMAN RESOURCE DEVELOPMENT**
- **INSTITUTION BUILDING**
- **TECHNOLOGY TRANSFER**
- **INFORMATION DISSEMINATION**
- **POLICY DEVELOPMENT & ADVOCACY**

SECTORAL COVERAGE AND R&D PRIORITIES

INDUSTRY

- Electronic and Semiconductor Industries
- Mining and Minerals
- Metals and Engineering
- Food Processing

ENERGY

- Alternative Sources of Energy
- Energy efficiency
- Transportation

SECTORAL COVERAGE AND R&D PRIORITIES

EMERGING TECHNOLOGIES

- Materials Science/Nanotechnology
- Genomics
- Biotechnology
- Information and Communications Technology (ICT)
- Space Technology Applications

SPECIAL CONCERNS

- Climate Change Adaptation/Mitigation
- Disaster Risk Management and Mitigation
- Environmental Issues

S & T WATER ENVIRONMENT

- Safe and potable drinking water

- PCIEERD, in coordination with the different stakeholders, developed the S&T Water Environment Roadmap.

S&T WATER ENVIRONMENT ROADMAP 2011-2016

Sustained ecological functions & services of water ecosystems

S&T Support for the Enforcement of Guidelines and Standards

S&T Capacity for Good Environmental Governance

2016
Upgraded the quality of water ecosystems in the country
- Localized effluent regulation standards

Enhanced industry compliance on water quality policies / regulations

Input in the formulation of guidelines/policies and standards on water environment sector

2015
- Adopted/implemented approved policies
- Formulation of Guidelines/policies/standards from results of R & D
- Updated / approved / formulation of guidelines / policies / standards (groundwater, sediment, Industry Specific Effluent Stds.)
- Harmonization of existing laws and policies (ETV, (Mutual Recognition Agreement among water quality testing, Institutionalization of incentives awards system. Market-based instruments for effluents

Upgraded capacities/capabilities of institutions for sustainable water envi management

Capacity / Capability Building of R &D Member Institutions / technical experts / researchers / law enforcers

Commercialized water technologies

Documentation of Success Stories

2014
Devt. of Tech. for Control of Point/Non-Point Sources of Water Pollution

Technology Transfer of commercialize technologies (IEC, publications, patents, operational manual and licensing)

Capacity /Capability Building of R &D Member Institutions,technical experts/researchers

Pool of technical people on water management (MS, MA, Ph.D.and others)

Enhancement / Development of Remediation Protocols

2013
Pilot Demo of treatment / rehabilitation / remediation technologies (i.e. Biofilm, Prototyping of Water filter, Kaolinite)

Development of Clean Technologies for Point / Non-Point Sources

- Collaborative Research Programs among academe, industry, government, civil societies and NGOs

Compendium/database database of water technologies

Technology Database / Techno-Demo on Prevention and Control of Water Pollution

2012
/ Technology verification of water technologies for SMEs
- Drink Program
  - Advanced oxidation process on waste water – DLSU
  - Development of Biological + Ozonation Process – UPD
- Better Mine Program – UP-DNMME and ADMU
- Development of Electro-Coagulation for Pharmawaste (PPCPs) – DLSU
- Pasig River Stewardship Program – U-Belt Consortium
- Bioremediation Technology – UPLB and Blacksmith

Established sector baseline, compendium of good practices and identified point/non-point sources

2011
Updated Inventory of Philippine Water Bodies, pollution sources, standards and policies
- Baseline data gathering and compilation of major rivers and lakes in MM
- Profiling on Non-Point Sources of Pollution (agricultural, domestic, mining)
- Centralized database on surface water resources for management purposes
- Policy analysis on water

S&T Support for Strengthening the R&D of Cost-Effective Waste Management and Treatment Operations & CP to reduce pollution at source

Vision and Mission

Ecological functions and services of water ecosystems are sustained through generations

MISSION:

- Provide S & T support for the enforcement of guidelines and standards under Philippine environmental laws
- Strengthen the R & D of cost effective waste management and treatment options and cleaner production to reduce pollution at source
- Build capacity for good environmental governance

Plans and Programs (2014-2017)

2013 2014 2015 2016 2017

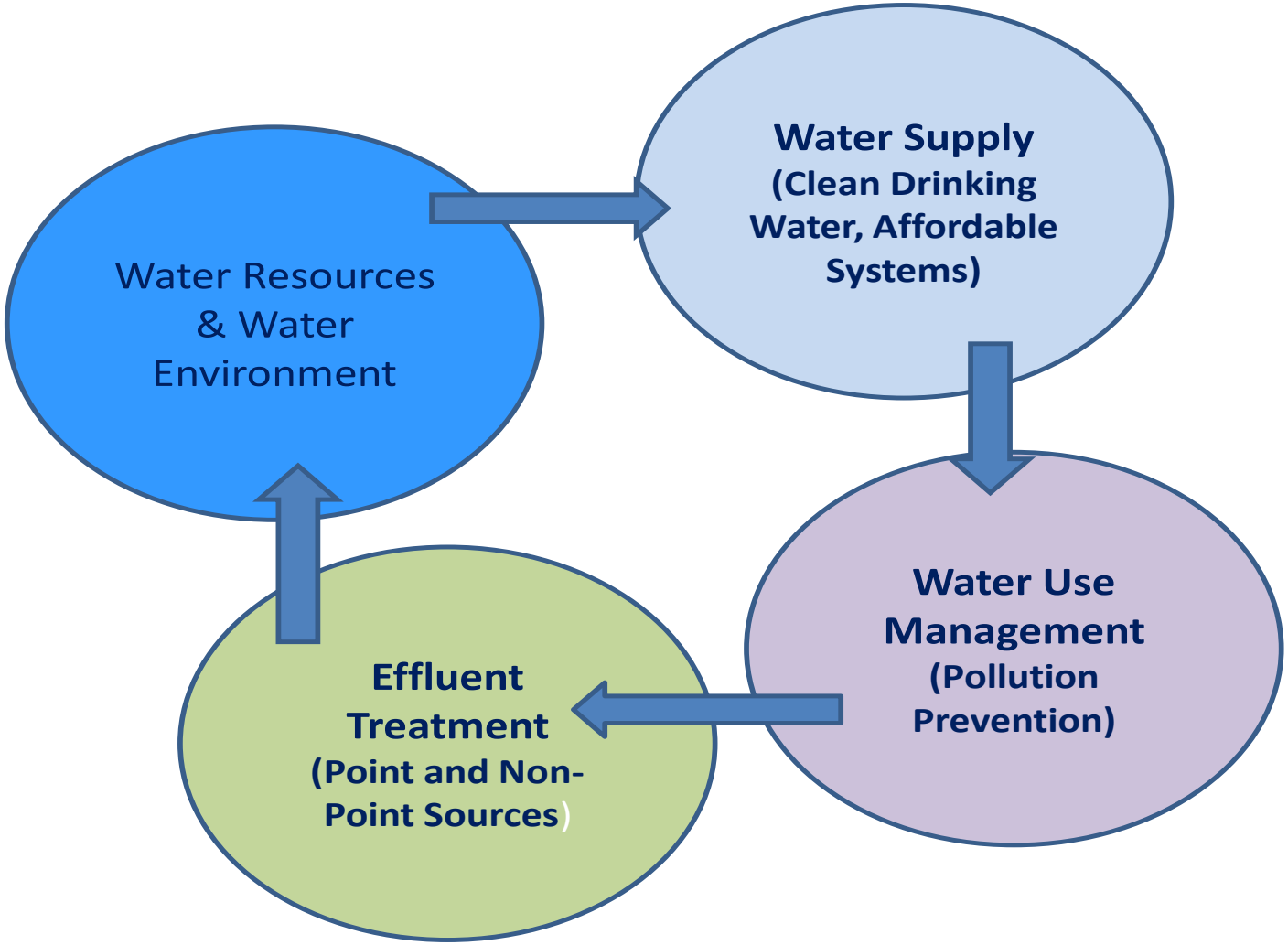
Water and Wastewater Treatment Technologies Program

Integrated Solid Waste Management Program

Air Pollution Management, Control and Abatement Program

Application of Phytotechnologies for clean up of Industrial, Agricultural and Wastewater Contamination

Commercialization of developed technologies on water, air and minerals sectors


Water Supply
(Clean Drinking Water, Affordable Systems)
Water Use Management
(Pollution Prevention)
Effluent Treatment
(Point and Non-Point Sources)
Water Resources & Water Environment

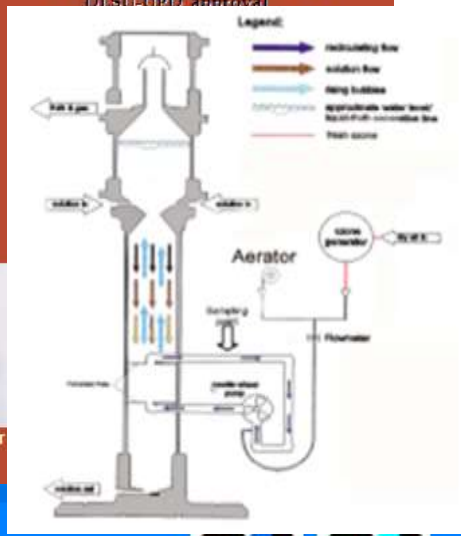
S&T Water Environment Projects

Water Use Management (Pollution Prevention)	Effluent Treatment (Point & Non-point Sources)	Water Resources & Water Environment	Water Supply (Clean Drinking Water)
Photocatalysis for textile & paper industries	Septic System for Temporary Shelters	Pasig River Stewardship through Science, Technology & Advocacy Program	Dome Type Ceramic Water Filters
Biological + Ozonation Process for wastewater treatment	Bioremediation technology for tannery & gold smelting wastewater	Green ACE Program – Estero de Paco	Production Centers for CWF
Nanofiber Membrane with Modified Nanoclay for Waste Water Treatment	Integrated Biological Wastewater Treatment Systems for the Food Processing Industry	Phytotechnologies Program	Pilot Production and Field-testing of Ceramics-based Water Filtration Systems
Coco Peat Filter Bed for Treatment of Heavy Metals	Isotopic and Geochemical Techniques to detect Organic Nutrient Contamination		
Philippine Montmorillonite Purification Technique for Nanocomposite Applications			
Electro-coagulation Treatment System for Pharmaceutical Waste Products			
Microbial Biofilms for the Rehabilitation of Heavy Metal			
Radiation-induced Grafting of Nonwoven Fabrics for Tanning Industry			

Water Use Management (Pollution Prevention)

Advanced treatment technology in treating colored wastewater from textile and paper industries using photocatalysis - DLSU

Biological + Ozonation Process for wastewater treatment – UP Diliman



Water Use Management (Pollution Prevention)

BETTER MINING TECHNOLOGIES Program

Nanofiber
Coco Peat Fiber
Montmorillonite
Biosorption of Aquatic Plants

Water hyacinth problem in Lake Palacpakin, San Pablo, Laguna.

Water Use Management (Pollution Prevention)

Field-testing of Integrated Gold-Copper Mineral Processing Pilot Plant in the Regions

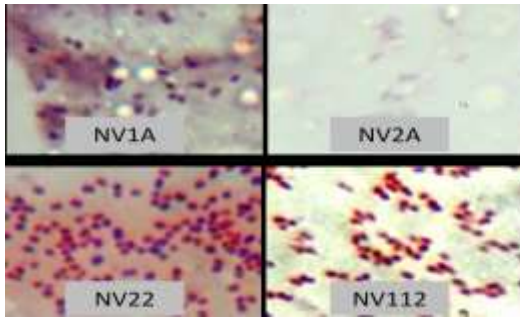
- ✓ GREENER technology option to recover gold at 99% with 80-90% efficiency
- ✓ Three (3) mineral processing facilities targeted by 2016
  - Benguet
  - Bicol
  - CARAGA

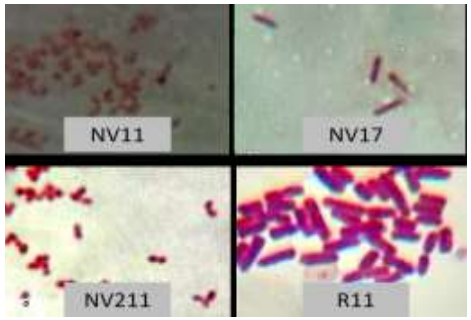
Water Use Management (Pollution Prevention)

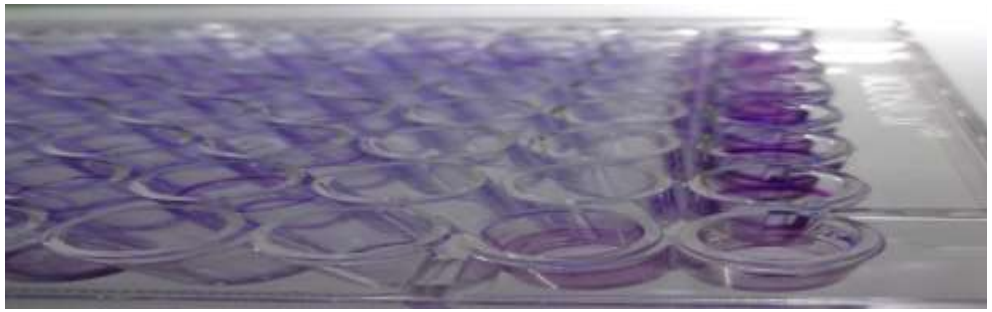
- Compact and Efficient Electro-coagulation Treatment System for Pharmaceutical Waste Products and Other Pharmaceutical and Personal Care Product Residues in the treatment of affected water systems

Water Use Management (Pollution Prevention)

Use of Microbial Biofilms for the Rehabilitation of Heavy Metal Contaminated Wastewater - UPLB

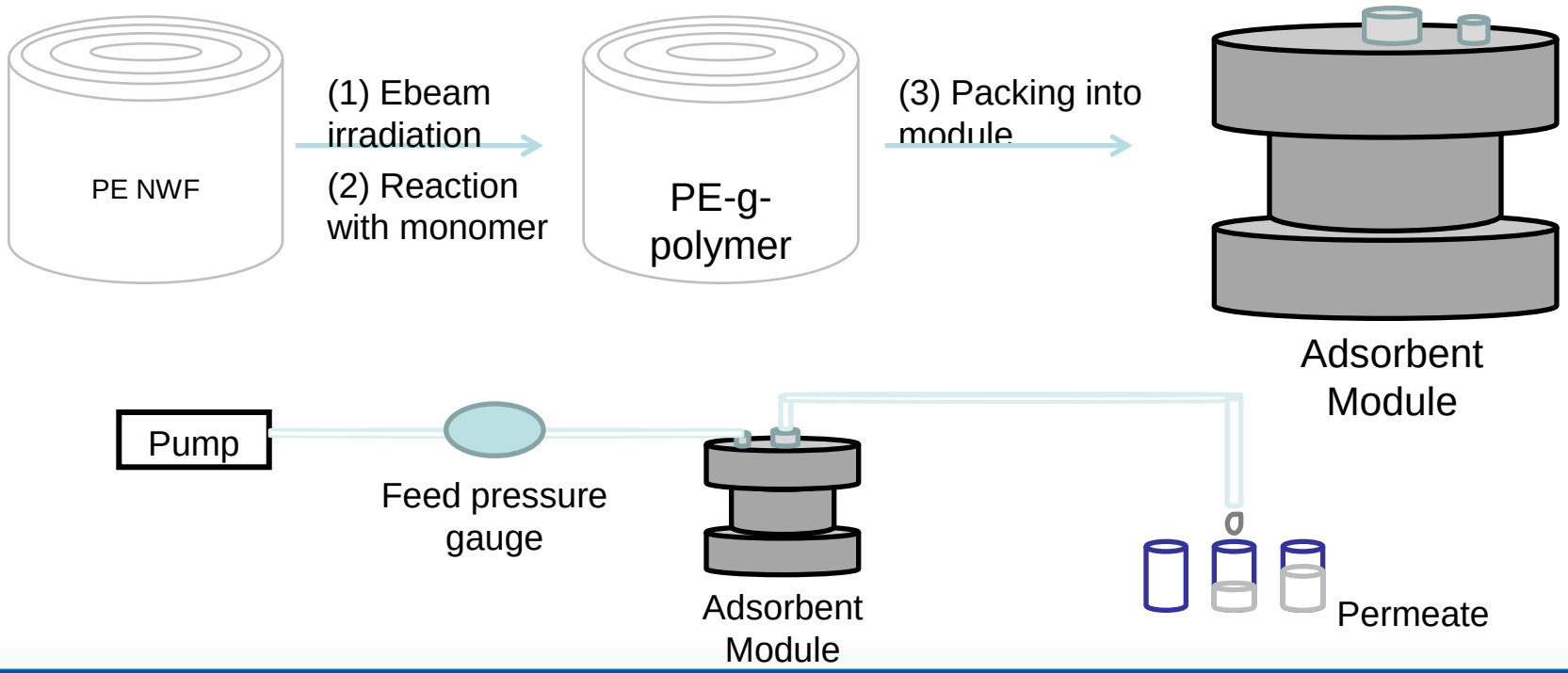






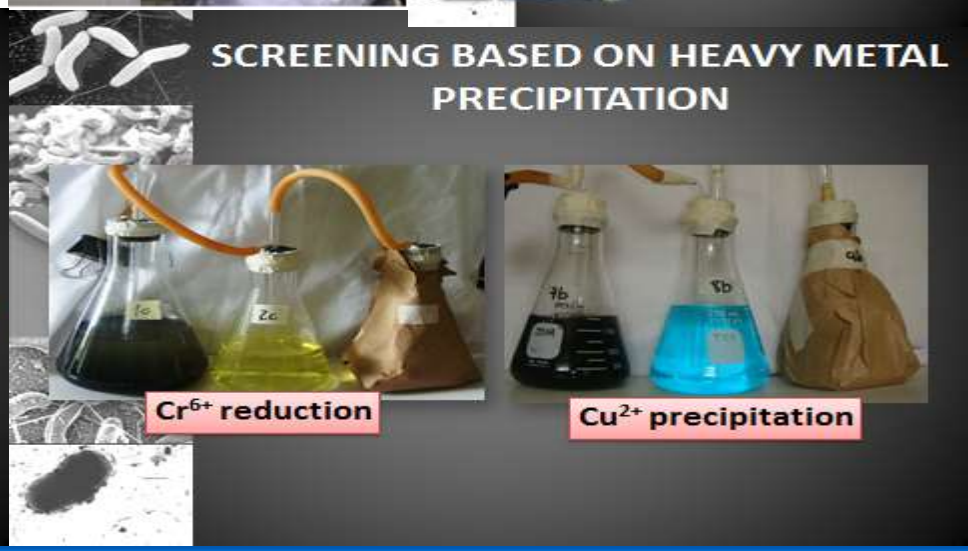
Water Use Management (Pollution Prevention)

- Radiation-induced Grafting of Nonwoven Fabrics for Tanning Industry Waste Water Treatment to Meet Class C Effluent Heavy Metal Standards



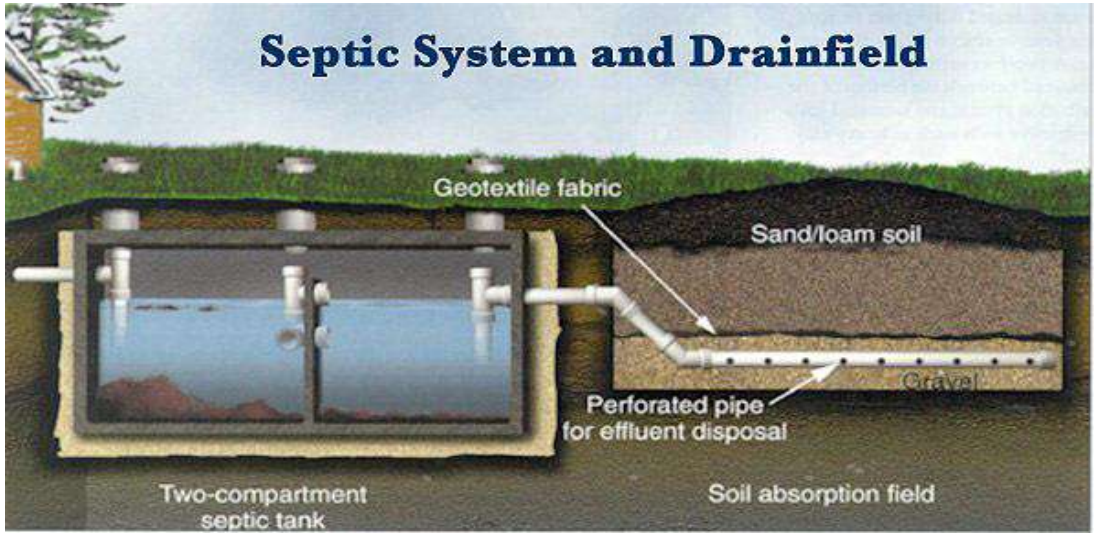
Effluent Treatment (Point & Non-point Sources)

- A clean up and recovery system of valuable heavy metals from industrial wastewaters (e.g. tannery and gold smelting companies) was developed using bioremediation technology



Effluent Treatment (Point & Non-point Sources)

- Eco-friendly Septic System for Temporary Shelters



Effluent Treatment (Point & Non-point Sources)

Isotopic and Geochemical Techniques to Uncover Point and Nonpoint Sources of Organic Nutrient Contamination in the Neritic Zone of Boracay Island

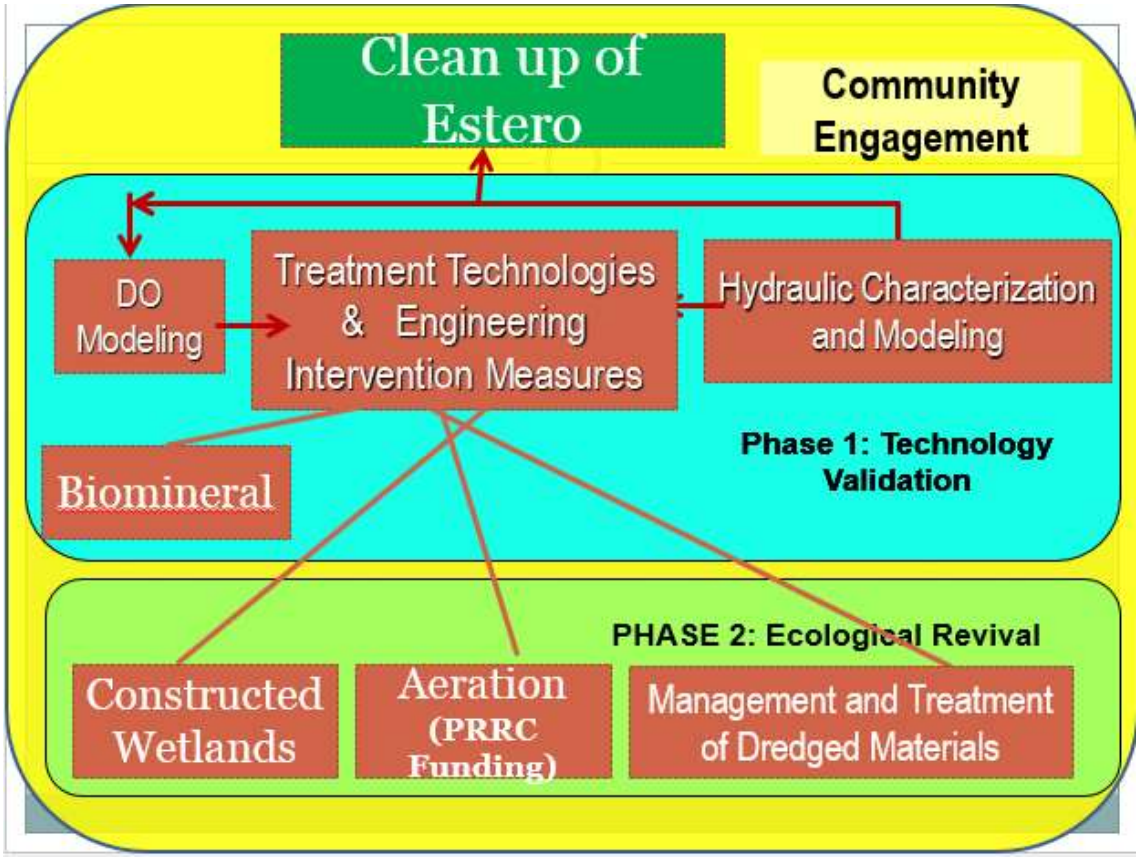
Development of a Compact Wastewater Treatment System Enhanced with Bioaugmentation Technology for Quick Service-Restaurant (QSR)

Water Resources & Water Environment

- Pasig River Stewardship through SCIENCE, TECHNOLOGY & ADVOCACY Program (13 schools – University Belt Consortium)

Water Resources & Water Environment

- *Green ACE Program – Estero de Paco*



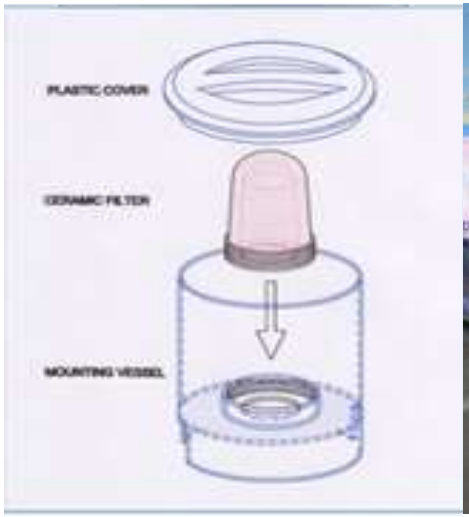
Water Supply (Clean Drinking Water)

Pilot Demonstration of Enhanced Water Filtration Systems

simplified, inexpensive and highly efficient clay-based water filter made of red clay and coated with nano-colloidal silver.

Water Supply (Clean Drinking Water)

Dome Type Ceramic Water Filters



Water Supply
(Clean Drinking Water)

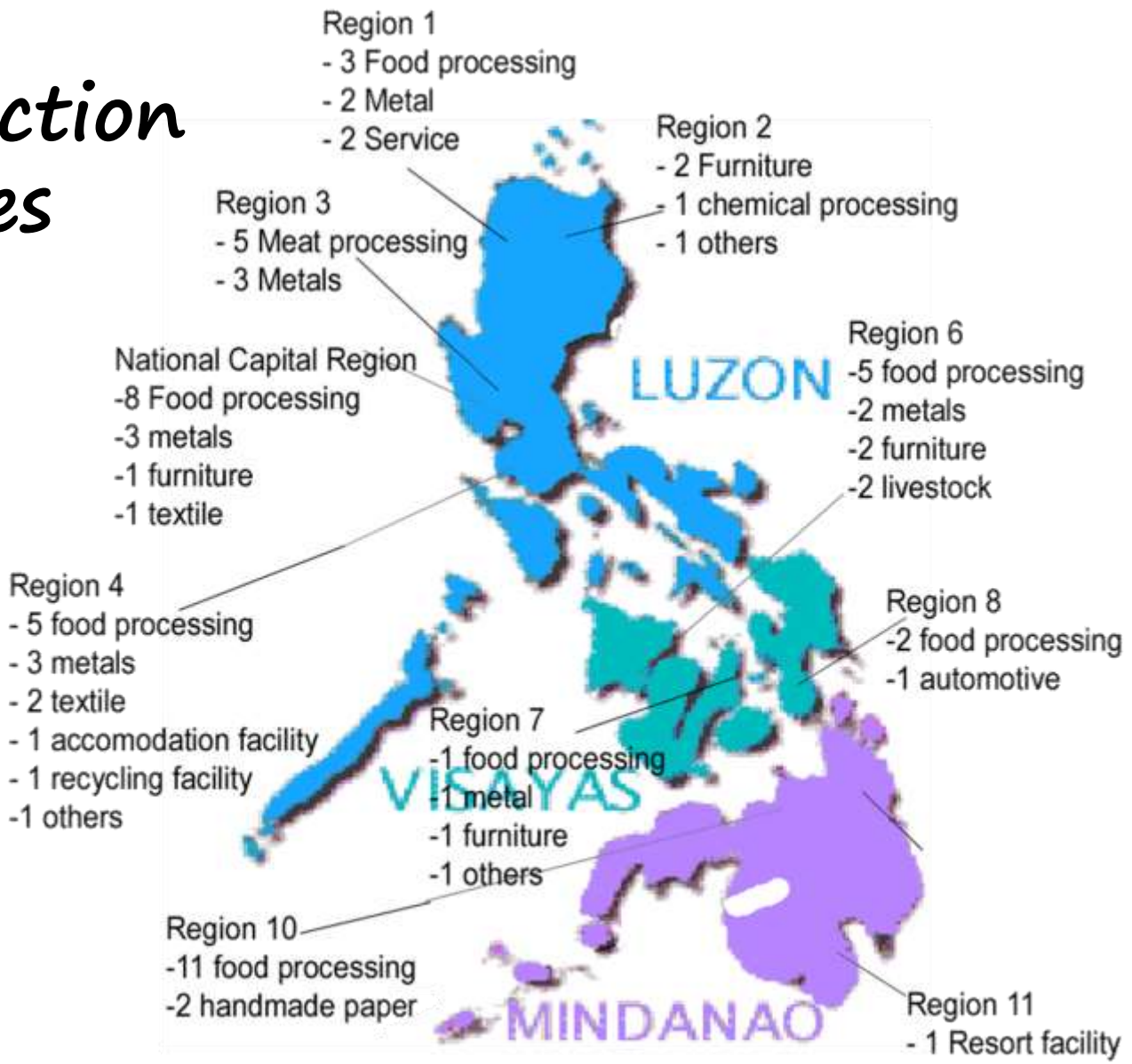
Production Centers for CWF

Water Supply (Clean Drinking Water)

Field-testing of Ceramics-based Water Filtration Systems

Cleaner Production Technologies

Cleaner Production Audit
- water and energy efficiency



CLEANER PRODUCTION

"Applying an INTEGRATED PREVENTIVE ENVIRONMENTAL STRATEGY to PROCESSES, PRODUCTS and SERVICES to INCREASE EFFICIENCY and REDUCE RISKS to HUMANS and the ENVIRONMENT"

– United Nations Environment Programme

Renewable Energy Act of 2008

- Accelerate the exploration and development of renewable energy resources
  - achieve energy self-reliance
  - reduce the country's dependence on fossil fuels
  - adoption of clean energy to mitigate climate change
- Provides fiscal and non fiscal incentives

Biogas Technology Situationer

- Small Biogas Systems widely utilized for power and thermal applications
- Extraction and Utilization of Landfill Gas – technology sourced abroad

Technical Assistance to Small-Scale Projects

Biogas Website

- To increase awareness
- Contains technical information and guide to adoptors

Training of Trainors

- Technical and economic aspects of anaerobic biodigesters
- 42 participants (gov't, academe, private, LBP)

CONCLUSIONS

- Technology Transfer of wastewater technologies generated
- Institutionalization of DOST Cleaner Production Efforts
- Promotion of Clean Technologies
  - Low energy inputs such as biomass or gas from anaerobic digestion plants
  - Effective use of alternative energy resources
- Water Desalination

THANK YOU!

KINDLY VISIT OUR WEBSITE AT

http://www.pcieerd.dost.gov.ph

DOST_PCIEERD

Department of Science and Technology
PHILIPPINE COUNCIL FOR INDUSTRY, ENERGY AND
EMERGING TECHNOLOGY RESEARCH AND DEVELOPMENT