

# Diverse Challenges Faced in Developing Sustainable Catchments

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## Editorial

The second conference on the “Challenges in Environmental Science & Engineering” series CESE-2009 was held at Jupiters Hotel, Townsville, Australia from the 14th to the 17th of July 2009. The conference brought together internationally renowned engineers, scientists, and researchers in the fields such as sustainability, water reuse, renewable energy, public health, and biotechnology to discuss the environmental challenges that the world is facing today and into the future. The conference had parallel presentation sessions for two full days that dealt with coastal processes and the Great Barrier Reef, catchment management, water quality, membranes, wastewater treatment, storm water management, reuse, sustainability, and bioprocess technology. The guest editors of this special issue are thankful to the Chief Editor of *Water, Air & Soil Pollution: Focus* for providing an opportunity to publish selected papers that were presented at CESE-2009 after peer review.

*Catchment Management* This special issue is going to include articles that are discussing the diverse

challenges faced from catchments to coasts by the human race when developing sustainable catchments. Sustainable developments of a catchment could happen only if the activities related to such developments are carried out in manners that cause minimum adverse effects on the catchment. For example, establishing a proper land use management and excellent water sensitive urban designs (WSUD) are essential in providing better standard of living to the inhabitants. Thus, the first paper will discuss appropriate land use for better catchment management, and the subsequent papers will investigate various aspects that are required for efficient water sensitive urban developments. One of the major components of WSUD is storm water management. Urban storm water has to be managed properly, and thorough understanding on the design of pollutant traps, leaching of pollutants in the storm water, and treatment of storm water is important in areas where many challenges are faced. What would happen to the coastal catchments in extreme cases such as inundation and could we conduct some modeling on climate changes? Thus, the next six papers will provide information on the above theme.

*Water and Soil Treatment* This will be followed by considering “Treatments for better catchments” as a topical activity and will consider contaminated lands such as acid sulfate soil and lands that are used for solid waste disposal, etc. as they can affect the water quality in the catchment. Treatment of different water

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sources will also be considered, and therefore, the next seven papers will discuss the following:

1. The theory of adsorption of pollutants onto soil matrix
2. How to prevent leaching of pollutants from landfills and acid sulfate soils in order to keep the freshwater sources clean
3. How to treat storm water to keep the freshwater sources clean
4. How to get more water by treating rain water
5. What happens when treating wastewater

*Sustainability and Environmental Management* The next aim for a better catchment management would be to consider sustainability in other activities such as production of energy and materials, construction of roads, etc. Better environmental education is also

important in providing a better understanding on sustainability. Five papers will be dedicated to discuss this area. While considering sustainable development, health, safety, and environmental education are paramount factors. Safety culture in work places will also be discussed under this section.

*Air Pollution and Control* This area of research is also very important to maintain better standard of living, and three papers will discuss how to model the air quality in buildings, how to disinfect the air, and the mass and energy transfer considerations for life support systems in space.

Thus, the papers are giving a sample of challenges that are faced in developing sustainable catchments, and we hope that this special issue will open the door to a new kind of approach in which challenges are seen holistically to provide sustainable solutions.