

Managing Land and Water Interactions

Land is no longer simply something to be farmed or built upon without consideration of the impacts to environment. There is increasing focus on the use of land to treat effluent of varying qualities, to generate clean water for human use or enjoyment, and to meet a range of ecosystem goals. Land management is important not only for achievement of maximum personal or community benefit, but also for its potential to alter impacts on adjoining areas and water resources.



Management of soil, water, nutrients, and other potential contaminants can use a wide range of options, including wetlands, and irrigated areas of vegetation that may include native forests, woodlots, landscaped gardens, hay crops, and vetiver grass. Many situations are unique, and require solutions that are not only tailored to the site but also to site resources and local expectations and needs. Too often, solutions proposed may not deal with particular constraints that are distinctive of a site or the issues facing it.



For projects involving on-land effluent disposal, Landloch commonly uses the MEDLI model, which is currently considered the industry standard for planning effluent disposal in Queensland. The model considers pond volumes, water balances and plant growth on a daily time step, and can be run for long periods of climatic record. Projects dealing with effluent disposal include:



- effluent-disposal design for a holiday camp in a highly sensitive area (close to a major water supply dam), using landscaped gardens, and a range of measures to prevent off-site movements of nutrient;
- advice to industrial firms with respect to disposal of a range of waste types;
- planning disposal of Nitrogen-rich water from a minesite, using irrigation of nearby forest;
- assessment of site-specific issues associated with on-land disposal of treated sewage effluent by shire councils, and review of opportunities for community benefits from the irrigation enterprise;
- monitoring impacts of effluent irrigation on soil properties.



Planning land application of some water streams can create concerns with impacts of specific ions (particularly sodium) and with salinity development. There are issues of basic soil science to be addressed, as well as the more obvious issues of water and nutrient use and irrigation scheduling. Landloch has monitored effluent disposal sites, and we note that temporal trends in soil properties need to be interpreted with caution, as climatic variations (impacting on plant growth, nutrient uptake, and on leaching in the soil) can have significant impacts on both soil nutrient levels and soil salinity.



Other Landloch projects and capabilities include:

- studies of grey water quality and rate of production and the potential for grey water re-use in urban environments;
- assessments of stream condition and stability, and review of impacts of sewage discharges on stream water quality;
- soil survey to identify land areas suitable for effluent irrigation
- determination of land areas needed for successful effluent disposal on non-sewered housing allotments
- wetlands design (water flow and quality considerations only).



The range of land management issues encountered by Landloch is enormous, giving considerable scope for application of basic expertise in environmental engineering, soil science, agronomy, and agriculture, allied with the inputs from a wide range of expert collaborators.



For assistance with the wide range of issues associated with water reuse and management of water resources, contact:

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