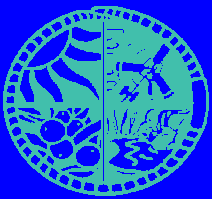


Opportunities for Onsite Water and Nutrient Reuse In Western Australia

**Dr Martin Anda, Dr K Mathew and Prof G Ho
Environmental Technology Centre
Murdoch University**

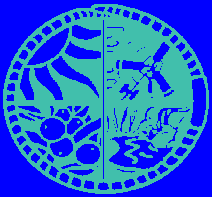
March 2002



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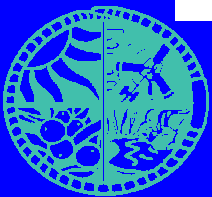
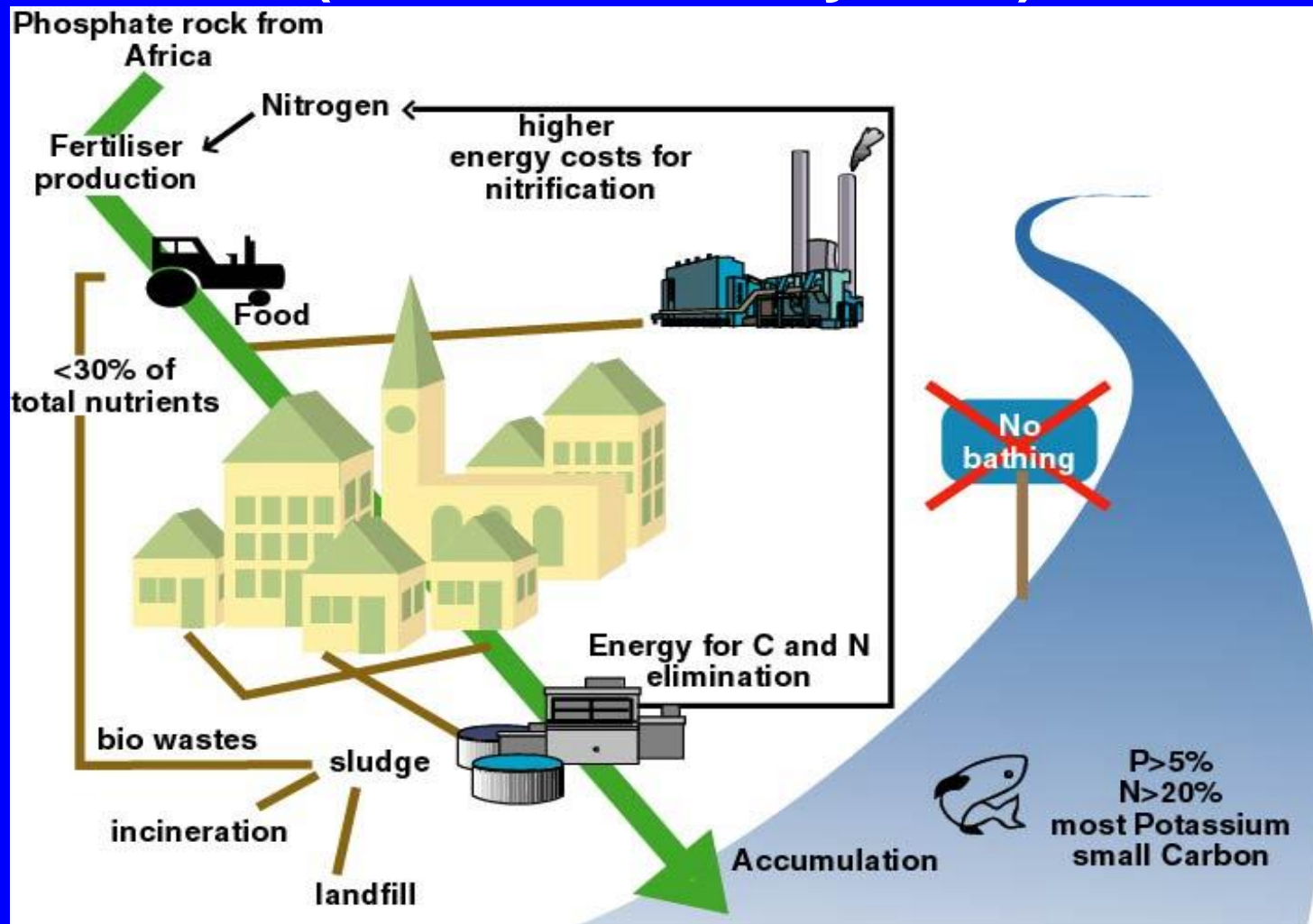
Traditional Approach to Wastewater Treatment

- ✓ Dispose with minimum treatment;
- ✓ Waste has no value;
- ✓ Keep it as far away as possible.



Unsustainable Wastewater Management (Conventional System)

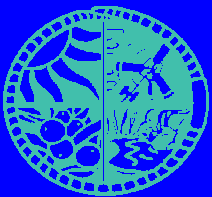
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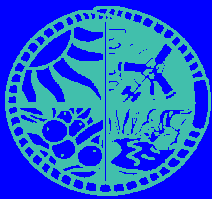
Disadvantage of Centralised Approach

- ▼ Loss of valuable resource (water & nutrients): 250 ML/day Perth;
- ▼ Massive investment and energy in pipelines and pumping;
- ▼ Leave the problem for future generations.



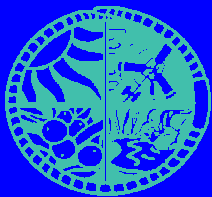
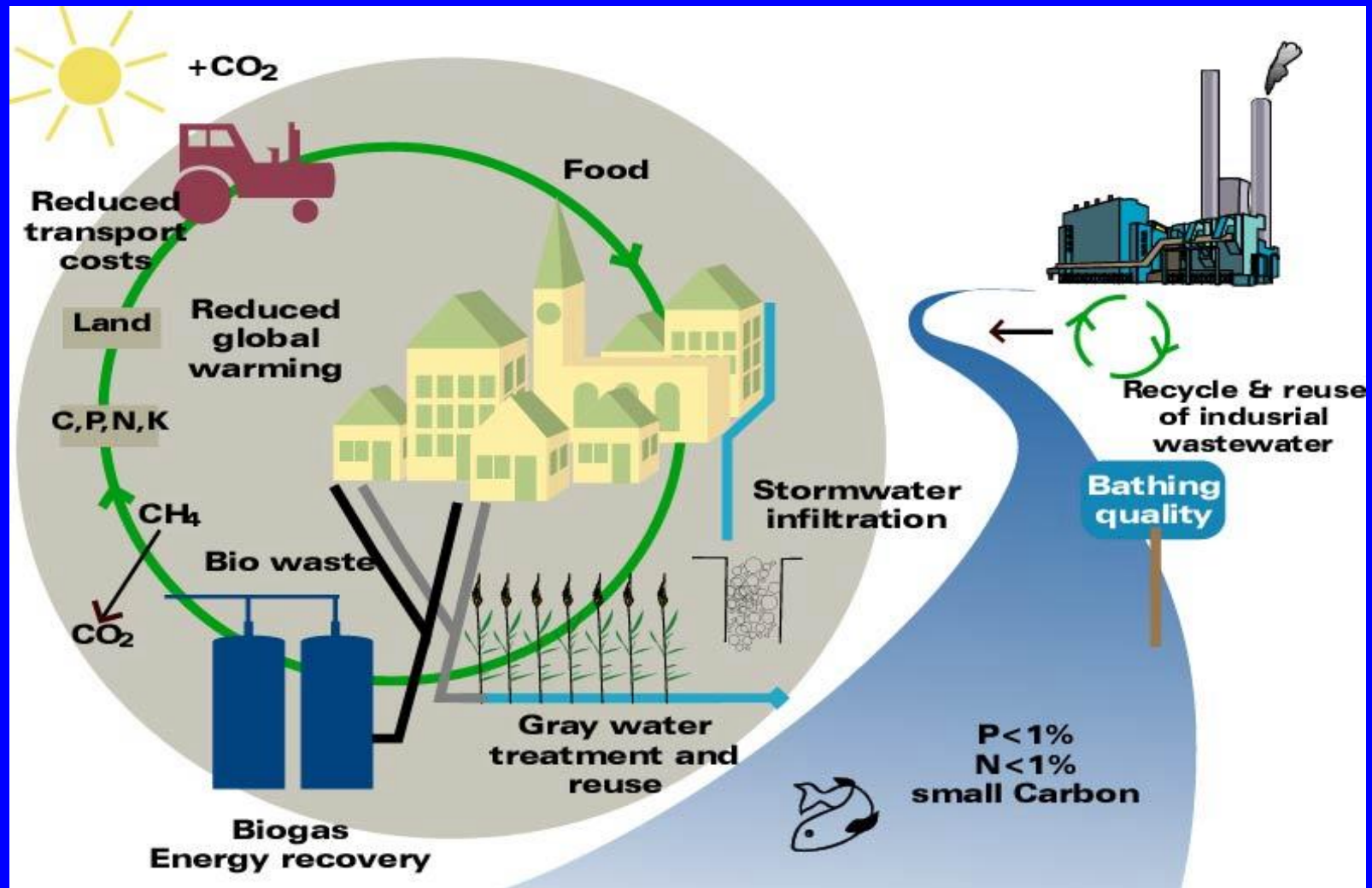
NEW PHILOSOPHY OF TREATMENT

- ✓ Consider wastewaters as a resource;
- ✓ Economically acceptable;
- ✓ Treat and make reuse possible;
- ✓ Develop practical technologies;
- ✓ Close the cycle;
- ✓ Encourage sustainable systems.



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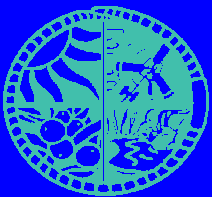
Sustainable Wastewater & Stormwater Management



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ONSITE APPROACH

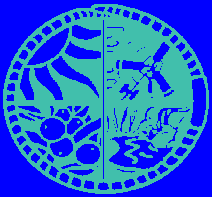
- ✓ Reuse or recycling of treated wastewater;
- ✓ By means of onsite or localised systems;
- ✓ Small to medium sized systems;
- ✓ ie household or municipal scale systems.



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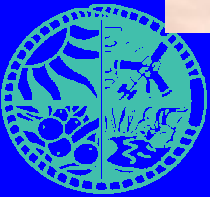
Systems Available

- ✓ Soil absorption (direct subsurface);
- ✓ Amended soil filters (eg Ecomax);
- ✓ Sand filters (eg Envirotech);
- ✓ Constructed wetland (open or subsurface);
- ✓ Wet composting (eg Downmus);
- ✓ Evapotranspiration (ideal in clay soils);
- ✓ Aerobic treatment units (eg Biomax)
- ✓ Urine separation (eg Roediger).



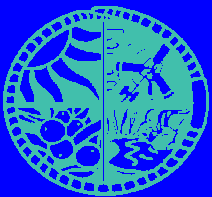
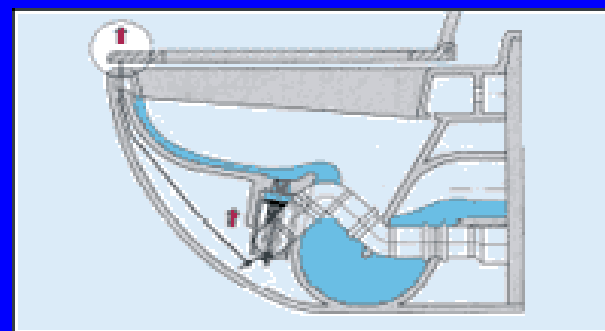
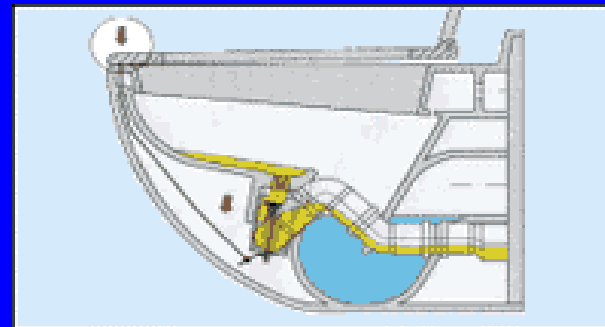
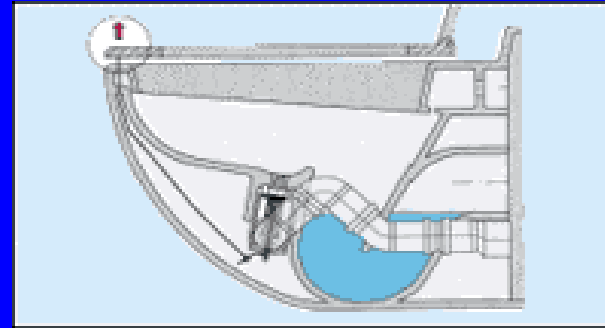
Systems Available

✓Eg Biomax aerobic treatment unit



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Roediger Urine Separation Toilet



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A photograph of a man standing next to a circular concrete structure in a grassy field. The man is wearing a dark suit and is standing on a circular concrete structure with a brown circular cover. In the background, there is a long, low, rectangular structure made of light-colored material, possibly sand or gravel, which is the bio-sand filter. To the left of the bio-sand filter, there is a circular concrete structure, which is the urine tank. The entire scene is surrounded by tall green grass and trees in the background.

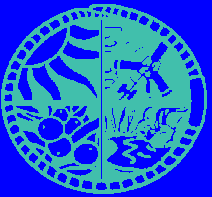
Bio-Sand-filter

Urine-tank

Composting-chamber

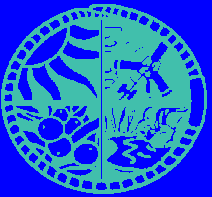
Sectors for Application

- ✓ Household greywater reuse;
- ✓ Household total wastewater reuse;
- ✓ Swimming pools (filter backwash);
- ✓ Caravan parks;
- ✓ Agro-industrial (eg piggeries, vineyards);
- ✓ Food and beverage industries
(eg breweries, poultry/fish processing);
- ✓ Industrial (eg Amcor cardboard).



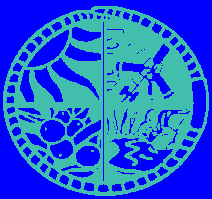
Examples

- ✓ Fremantle community garden (Ecomax);
- ✓ Carrington Estate (Aquarius);
- ✓ Claremont (Biocycle greywater)
- ✓ Nedlands (Natureloo);
- ✓ Amcor;
- ✓ Domestic greywater recycling trial 1999;
- ✓ ETC (wetlands, Biomax, greywater reuse);
- ✓ Piney Lakes (Hybrid).



Advantages of Onsite Systems

- ✓ Localised reuse possible;
- ✓ Greening of urban and rural areas;
- ✓ Water savings (up to 50%);
- ✓ Distributed effluent loading;
- ✓ Nutrients can be assimilated or reclaimed;
- ✓ Many local and Australian technologies exist;
- ✓ Promotes innovation, economic development and creates employment.



The Way Forward

- ✓ Legislate and promote greywater recycling;
- ✓ Expand country town reuse;
- ✓ Decentralise Water Corp facilities by sewer mining for local reuse;
- ✓ Establish model subdivisions to demonstrate onsite systems;
- ✓ Support local government initiatives
- ✓ Community awareness raising.



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