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# Adapting to climate change - "Sustainable practices" are the way to go

Stanley Yokwe, NACC Sustainable Land Use Program Leader, Geraldton

In 2001 CSIRO published its projections that Australia will warm at a slightly faster rate than the global average, reaching 0.4 to 2.0°C above average by the year 2030 and 1.0 to 6.0°C by 2070. In the recent WA State of the Environment Report we were also warned that our State average temperature has increased by 0.8°C, the sea level at Fremantle has risen 15 cm over the past 100 years, and that winter rainfall in the south west part of the State has markedly dropped by 15 % over the past 30 years.

These predictions are already manifesting in many parts of our State, particularly in the Northern Agricultural Region (NAR) where the farming community has suffered the worst drought (2006) on record with a dramatic decline in crop yield and farm returns.

In the NAR, like elsewhere in Western Australia, some of the obvious impacts of climate change are the potential reduction in crop yield and production, degradation of natural vegetation and wetlands. Predicted changes due to rainfall and temperature may result in a 10-30 percent decrease in wheat yield in the northern wheatbelt region.

Studies which assessed the effects of three climate scenarios for 92 species of the endemic WA genus *Dryandra* and 27 species of *Acacia* predicted that 28% of *Dryandra species* will disappear completely with a 0.5°C warming, and the bioclimates of 59% of *Acacia species* would disappear with a 1°C increase.

Recognising the need for action to tackle the climate change problems, and given the level of

attention being focused on the climate change issues in the NAR, NACC, in collaboration with DAFWA, have jointly implemented a number of projects that have a direct link to issues of climate change. This is by making funds available through funding from the National Heritage Trust/National Action Plan for salinity and water quality and the government of WA. Among others, this includes:

- Farming to the climate - managing climate risk and variability in the low rainfall area of the NAR. This project delivers monthly growing season outlook updates for the NAR to growers and agricultural consultants; and examines farming system options to manage climate variability and risk.
- A pilot project to measure and sell the carbon sequestered under perennial pastures in the NAR. This is an Australian first, where projected increases in soil carbon under sub tropical perennial grasses in paddocks across the region will be measured in soil samples down to 110 cm. The increase in carbon stored in the soil will be sold to Rio Tinto Coal for \$25/t of Carbon Dioxide Equivalents.
- Evaluating the productivity of a range of perennial pasture and fodder shrub options on farms in the Binu area. Although long-term datasets are required to predict the impact of perennials on the productivity of land, the preliminary data from the 2006 drought has shown that these perennials can more than double the productivity of land while

preventing erosion. Farmers' actual grazing data will be used to build whole farm economic models to examine the financial impacts of changing to these drought-proofing systems.

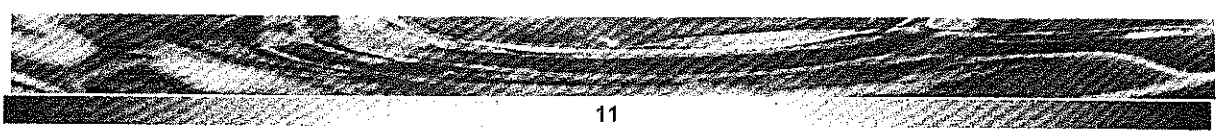
- Testing a range of perennial pasture options in low rainfall wheatbelt regions where currently no viable perennial options exist.
- DAFWA, in collaboration with the Liebe Group, is studying the water erosion risk of controlled traffic systems in the NAR when faced with more frequent and intense episodic rainfall due to shifts in rainfall patterns resulting from climate change. Observation sites, rainfall simulator measurements and overland flow and erosion models are being employed to estimate management circumstances at most risk of severe water erosion from decayed cyclones and storms. A technical manual with best advice to minimising water erosion risk is being developed"

### Further Reading

[www.soe.wa.gov.au/report/overview.html](http://www.soe.wa.gov.au/report/overview.html)

[www.agric.wa.gov.au/pls/portal30/docs/folder/ikmp/lwe/rpm/landcap/wheat\\_and\\_climate.pdf](http://www.agric.wa.gov.au/pls/portal30/docs/folder/ikmp/lwe/rpm/landcap/wheat_and_climate.pdf)

To give feedback on this article or seek more information, contact Stanley Yokwe at the Geraldton office on 9956 8503.



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# Salinity in the NAR: Getting the basic message to the community

Stanley Yokwe, NACC Sustainable Land Use Program Leader, Geraldton

## Salinity in our region?

It is now well understood that in the Northern Agricultural Region (NAR) secondary salinity is caused by rising groundwater levels bringing salts to the land surface. This has been caused because we have removed the native vegetation (for our settlements and agricultural use) and replaced it with annual crops and pastures that have shallower roots and different seasonal growth pattern.

## What are the impacts?

Generally, salinity dramatically reduces farm production by reducing yields and retarding growth of broadacre cereal crops and traditional pasture, but also affects other important interrelated community and natural assets such as diversity of native plants and animals, wetland, rivers and infrastructure such as buildings, roads, bridges and sewerage lines. Salinity is also linked to other degradation issues such as soil erosion and eutrophication of streams<sup>1</sup>.

One big challenging issue is a lack of information on how landholders and communities can get involved in protecting our valuable natural resource assets from the salinity risk. This article intends to provide information to

the community on how to become a proactive participant in Natural Resource Management (NRM) to ensure healthy environment of our region.

## What is being done?

While much has previously been done for NRM in the region, a boost has come recently in the form of a joint effort between the Commonwealth and the Western Australian State Governments. This was made to specifically allocate funds for Salinity and Water Quality (via Natural Heritage Trust and National Action Plan). As a result regional groups such as NACC gained a key role in providing leadership on Salinity issues affecting the region by bringing together State and Commonwealth Government initiatives to match with local community aspirations.

Since 2004 NACC has been collaborating with other NRM groups in supporting a number of salinity projects in the region, including:

- A mixed drainage and engineering program such as revegetation of natural drainage lines and protection of remnant vegetation;
- Salinity rehabilitation and extension program;

- Fencing off existing remnant vegetation and waterway;
- Introduction of perennials through bushwood regeneration etc.

Currently there are a number of opportunities for individuals, community groups and other organisations involved in NRM to access funds and resources to improve the health of our environment. For example through *Envirofund*, communities can undertake local projects aimed at conserving biodiversity and promoting sustainable resource use. Your local NACC NRM officer can assist you in the preparation of funding submissions for the projects (you are also most welcome to contact me for local NRM contacts).

In order to ensure NACC continues to represent the NAR community as widely as possible and for you to access the latest information on NRM including grant applications and latest research results, I encourage you to become a NACC Member. Membership forms are available in the NACC Administration office at 9973 1444.

To give feedback on this article or seek more information, contact Stanley Yokwe at the Office on 9956 8503



# COUNTRYMAN

May 15, 2008 Vol 123 No. 6149 \$1.60

www.countryman.com.au

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## Locally grown is the good oil

Peri-urban agriculture has many advantages including that it is economically efficient. For example, purchasing food that is grown locally saves the cost of energy required and reduces costs associated with transport and refrigeration.

Economic development and community revitalisation are also achieved when farmers take pride in peri-urban farming.

They gain net benefits from growing and marketing their own food in the nearby city centres, and their farming businesses provide new opportunities for businesses and jobs for inner-city dwellers.

Furthermore, the urban resident can benefit from recycled wastewater and sludge. However, pushing good agricultural soils further away from our city fringe may present far more serious threats to our future food security.

These threats can be seen within the context of current decline in oil supplies or increase in the price of oil.

Oil is an essential ingredient in facilitating agriculture industry. For example, plough-

ing, seeding, irrigating crops, harvesting, packaging and distribution of food are all oil dependent.

Commercial food processing also depends on oil. The contemporary belief that conventional agriculture can feed all of us is completely dependent on the flow and distribution of oil.

There shouldn't be any problem if the oil that supports our agriculture is renewable, remains cheap and accessible. But this isn't the case.

As oil supply declines and/or oil price continues to increase it will then present us with a situation where we are not able to produce enough food or transport a large quantity of food to distant consumers' markets, especially when distribution is by big trucks.

Traditionally, the access to oil was more to do with consensus between the oil custodians and the buyers.

However, this trend is changing as we see now. The fact that much of the world's accessible reserves of oil and gas are found in countries with unstable politics can make it

difficult to access oil for agriculture in future, especially if self interest creeps in.

Some people may argue that if we run out of fossil fuel we can fix the problem by exploring other sustainable approaches, such as biogas, wind energy, biomass or other bio-fuel as we are doing now.

While these options have promise to be energy efficient, the question that remains is whether these options can effectively substitute for traditional fuels.

One solution for this is to encourage proximity and localisation of farming systems. In mean, we need to encourage farmers to remain closer to consumer markets.

In this way they are then able to re-establish local supply systems and substitute the need for far production and distribution systems. This would save energy and reduce the production costs.

However, localising the food system will require that the good soils in peri-urban areas should be set aside as an agricultural precinct to address most of these problems.

Stanley Yokwe, Geraldton

tionally — also ended up with only loose change. The State Government allocated just \$500,000 to climate change research, leaving farmers and environment groups dismayed.

Condongup cattle farmer Nicole Chalmers echoed the thoughts of many, saying there was a marked lack of funding for anything to do with the environment in the Budget, especially with a long-term view for sustainable farming practices.

"The Government seems to have forgotten climate change and ignored the need for renewable energies for cleaner and greener ways to transport our produce around the State," she said.

With a talented pool of agricultural academics and business leaders, adequate and sensible financial support on all fronts will only boost WA's bottom line in the long run. Let's make that a priority.



**HAVE YOUR SAY**  
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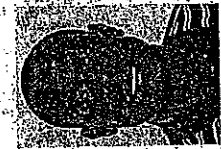
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# Waste not: making every drop count

In a region where water is scarce and other natural resources are degrading, aquifer management using treated wastewater is not a luxury; it's a matter of survival itself.

In the current scenario, where our groundwater is being depleted, other water ecosystems are becoming polluted and degraded, and development of new sources of water is getting more costly, there is no option other than to treat the let's of gallons of wastewater dumped into the marine environment annually, and inject it back into aquifers.

Another area of concern is the costs associated with clean drinking water. It's important that we learn from other regions of

the world with success stories, and develop ways to make every drop of waste water count.

For example, Israel, California, El Paso in Texas, USA and Namibia are some success stories.

Israel is plagued by water scarcity and is a world leader in wastewater recycling which accounts for 30 percent of its total supply up from three per cent 20 years ago.

They have been forced to treat wastewater and brackish water and develop water harvesting (collecting, storing, and using rainfall) to supplement supplies.

By recycling urban wastewater for irrigation the country not only saves precious fresh water but prevents the environ-

mental damage caused by wastewater.

In California treated wastewater supplies about 16 per cent of the return flow to ground water basins, while in Namibia a direct pipe-to-pipe reuse system has existed for over a decade with no problems.

El Paso, Texas, has successfully been putting treated wastewater into reservoirs and using it as a potable water source since 1985.

We should develop measures that suit our local conditions and make recycled wastewater an integral part of the management of our water resources, particularly in the context of looming climate change.

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## Land planning students explore

REGIONAL planning students from Curtin University recently took first-hand at the agricultural and environmental issues confronting the region.

The 75 students were hosted by the Northern Agricultural Catchments Council (NACC) — the peak environmental and natural resource body in the Northern Agricultural Region.

They were accompanied by Prof John Glasson, who was visiting from Oxford Brookes University. According to Stanley Yokwe, sustainable land use program leader, Prof Glasson chose the Mid West

region due to the range of environmental issues being faced here.

The students went on a field trip in Geraldton and then heard a presentation from Mr Yokwe and Department of Agricultural and Food (DAFWA) staff. They also visited a number of sites and towns including the Shire of Perenjori where they were taken through some of the local planning issues with NACC CEO Alan Bradley and Shire CEO, Stan Scott.

"During the day the students came to see clearly myriad of environmental problems in the area



Curtin University students visited the Mid West recently to learn about environmental planning issues in the region. They were led by Professor John Glasson, right, who is visiting Curtin University from Oxford Brookes University in England, with Mike Bowley, regional manager of the Department of Agriculture and Food and Stanley Yokwe, sustainable land use program leader, far left. Picture: CONTRIBUTED

and how NACC and its partners are working to protect and repair six key valuable assets: land, biodiversity, water, coastal and marine, atmosphere and community, that are under threat from such environmental crisis.

"Having students and professionals visit this region is crucial to sustainability into the future," he said. "The region is hugely important for a number of reasons: it is located within one of the world's biodiversity hotspots, and that it has been identified as being at risk from

climate change.

The Northern Agricultural Region is also one of the nation's most important primary production areas and letting the up-and-coming scientists and planners see it first hand is important to our future," he said.

# Greenhouse fixes