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The Canterbury Water Management Strategy final document expresses a jumble of admirable goals, but it is difficult to unravel from the mountain of information just what it all means in very simple terms that the layman can understand. Perhaps answers to some simple questions may help us all understand the direction that the CWMS is taking the region.

1. Has the CWMS come to the conclusion that water storage/infrastructure is necessary?
2. If so does the CWMS believe that it has a mandate to proceed with such infrastructure?
3. If yes, then where does this democratic approval come from, and what issues were considered?

Despite the claim that water storage is going to resolve all rural problems, and the claim that establishment of riparian restorations funded by the ratepayer will solve water quality, there are a number of other issues to consider.

Perhaps the most important document of the history of human agriculture "Dirt the erosion of civilisations" by Professor David R. Montgomery, a thorough analysis of world agricultural practices over the last 2000 or more years, the author ends his review with the following statement:

"Whereas the effects of topsoil erosion can be temporarily off-set with fertilisers, and in some cases irrigation, the long term productivity of the land cannot be maintained in the face of reduced soil organic matter, depleted soil biota, and thinning soil that so far have characterised industrial agriculture."

He cites the Ancient Romans, who despite all their clever viaduct systems for water transfer, their agricultural system collapsed and become dependent on the cradle of the Ancient world the Nile delta. However the reason the Nile delta was so productive, is that all the soil nutrients from the African sub-continent were transported by the Nile to the Nile delta where the richest and deepest topsoil in the world still exists. The book also cites examples in Asia and Peru, where farming practices aimed at preserving the life of the soil helped communities survive thousands of years, but without irrigation, and without the assumption that water must be perpetually abundant to succeed. This was achieved by successful land management strategies NOT water management.

In order to make agriculture more sustainable and less destructive, practices such as crop rotation and soil husbandry need to be encouraged to maximise the yield of food calories relative to inputs applied. The use of leguminous plants should be encouraged to add nitrogen to the soil. Leguminous plants not only provide useful food calories, the nitrogen added to the soil does not lead to harmful nitrous oxide, nor nitrates that leach into groundwater. This would go a long way to reducing the impacts of farming in the region, would likely reduce water demand, increase food production, and would likely increase profits to the farmer in the long term. The continued use of chemical fertiliser for short term dairy production is not sustainable.

The Canterbury region would also see a dramatic improvement in biodiversity if all landowners were to commit 10% or more of their land for the restoration of indigenous flora. With carbon trading, this will hopefully earn them money, and will have exciting implications with respect to biodiversity and tourism in the region. Blocks of forest restored with native planting throughout the region would help bring shelter, and possibly slow erosion of topsoil from strong winds, and heavy

rains. The deep root structures would help soak up nitrates building up in the soils. Biodiversity and nitrate leaching should not be considered problem solved with just a few riparian restorations.

The need to commit land for carbon sequestration in the form of forests is going to be a critical issue worldwide, as the rate of melting of glaciers around the world, melting of Greenland ice, which is occurring faster than scientists had predicted, the melting of the Arctic ice sheet, increasing droughts and floods, are all indicators that the earth is collapsing around us. With CO₂ at levels at 380ppm there is only a short time frame in which to attempt to reverse the process of warming due to greenhouse gases. This will not just require reduction of emissions, but the soaking up of considerable atmospheric carbon. The best way to sequester large amounts of atmospheric carbon is through forest regeneration.

Yours Sincerely,

Dr Anthony Raizis