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**WWF Submission on:  
Rural Water Use and the Environment: The Role of Market Mechanisms  
Productivity Commission Issues Paper**

WWF will comment on what are considered to be some of the key aspects from an environmental perspective with regards to measures to increase on farm efficiency, externalities associated with commercial water extraction and some of the “beyond the farm” issues raised by the Commission.

**Water futures**

It is estimated that, globally, more than 1.1 billion people lack access to safe drinking water and Australia is in no way isolated from this problem. At the Xth World Water Congress, the then Minister for Environment and Heritage Senator the Hon Robert Hill made plain the impacts of inappropriate management of Murray/Darling water in the rural sector, and the economic and social consequences of deterioration in the quality of Adelaide’s drinking water.

He said:

*“A recent Salinity Audit has found that within 20 years Adelaide's major supply of drinking water, the Murray, will not pass World Health Organisation standards on two days out of every five.*

*This in itself could pose enormous treatment costs to bring the water to an acceptable standard. But the economic and social consequences of further deterioration in the quality of Adelaide's drinking water beyond that point are almost unthinkable.<sup>1</sup>”*

The need for sustainable water use in Australia’s rural sector, and its wider implications for our social and economic health, is plain. WWF believes Australia is well-placed to see both rural and urban communities use water efficiently and sustainably, and welcomes the Commission’s work towards a framework which will best serve these ends.

Trends towards degradation in our natural above and below-ground water infrastructure were made plain through the Commonwealth’s National Land and Water Resources Audit. The Audit’s overview of water resources found that Australia’s water use has increased by 65% since 1985, and that 34 of 325 basins and 59 of 538 groundwater management units were, in 2001, highly or overdeveloped<sup>2</sup>.

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<sup>1</sup> <http://www.deh.gov.au/minister/env/2000/sp13mar00.html>

<sup>2</sup> NLWRA *Water Resources – an Overview Australia*, Commonwealth of Australia 2001



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WWF believes that if the National Water Initiative is implemented properly, Australia will generate more wealth from less water at the same time as restoring, sustaining and protecting the health of our surface and underground water systems.

We also welcome the Howard Government's commitment to the Australian Water Fund. WWF does not believe money from the AWF should be directed towards projects designed to access new or previously untapped water resources, but rather directed towards projects with potential to achieve physical and economic water efficiencies in existing enterprises.

The Natural Resource Management Ministerial Council's Chief Executive Officers' Group on Water reported in April 2003 to the Council of Australian Governments (COAG) on water access entitlements and other issues (see Attachment 1). The Group identified a number of impediments to continuing reforms, two of which WWF considers need further attention as listed below:

*9. Despite progress made, a number of impediments have emerged as each jurisdiction has worked to put reforms in place. The CEO's Group on water has found these to be:*

...

*d) Knowledge about the needs of the environment is incomplete and community values are changing, making it difficult to achieve consensus on local management plans*

*e) There are limited opportunities to introduce market discipline when the resource is not properly priced.*

Defining the value, economic or otherwise, that a community puts on a public asset in a meaningful and quantifiable way is challenging, especially in the context of shifting social attitudes and environmental variability.

Similarly, defining the needs of an ecosystem, and quantifying those needs in terms of farm-management decision-making is difficult. Providing for appropriate water sharing between a consumptive pool and a non-consumptive pool is crucial to good management of Australia's water assets, and WWF believes water allocated to maintaining natural water infrastructure must be afforded the highest possible security.

### **The need for robust water accounting**

Without a robust system of water accounting, measuring the effectiveness of water efficiency measures will be impossible, particularly in unregulated water sources.

WWF has previously recommended that a system of water accounting must be developed, in accordance with National Water Accounting Standards that enables the preparation of accounts for:



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- Specified basins and regions, catchment and groundwater systems in accordance with Commonwealth and State water resource planning guidelines and policies.
- The water management plan area, including the environment, urban, stock and domestic, unspecified allocations (leakages, fire, etc), irrigation, other consumptive use, water use efficiency savings, reduced water yield from land use changes, salinity interception schemes, increased groundwater use; farm dams.

The accounting system needs to address:

- Return flows
- Interactivity between groundwater and surface water
- Changed land use
- Natural processes of water movement across land, through vegetation, down rivers, through wetlands, into dams, drainage into aquifers, etc.

In order to provide a sound basis for trade in water, water management authorities must establish and maintain accurate accounts for all water allocations as provided in the water accounting standards as specified in the regulations. The accounts are to be updated continuously and are to be accessible electronically.

A flexible regulatory system governing market mechanisms must ensure water is moved to where it is most efficiently used, where it is of greatest economic value, and where it is available over and above the needs of the environment.

Market mechanism do not have the potential to identify and respond to climatic variations in water availability

### **The need to limit environmentally-damaging water trades**

*“Markets make good servants, but poor masters.”*

– Wentworth Group 2003

WWF supports the establishment of water markets and the use of water trading to move water to its most efficient economic use as long as trading does not result in net harm to the environment.

The environmental impacts of transferring water must be fully understood prior to allowing water to be traded. Water trading resulting in a negative impact on the environment either through in-stream impacts or on-ground use should not be allowed. Where these impacts are not fully understood, a precautionary approach must be applied.

WWF considers that the “Robust Separation” framework proposed by Young & McColl<sup>3</sup> provides a good model for protecting the environment from the negative impacts of water trading. The framework recommends separation of the entitlement to water from the right to its use. On-site impacts would be regulated by licenses, which specify use conditions and third party impacts based on water management plans. However, potential negative impacts on flows due to shifts in extraction points would still need to be adequately assessed before trades are permitted

WWF knows of no examples where water trading has resulted in environmental assessment through the existing Environment Protection and Biodiversity Conservation Act 1999 (EPBC) referral process. We understand this is because water trading, despite its potential for environmental implications, currently falls outside interpretation of an “action” under EPBC. However, there may be potential to use the existing referral framework to assess, in a transparent manner, the environmental implications of water trading, most particularly larger scale, cross-catchment or interjurisdictional trades.

In order to effectively assess the environmental impacts of water trading, cumulative impacts of large and small scale trading should be considered.

Other issues that WWF considers important in water trading that may be of relevance to the Commission’s investigations are:

- Water trading should not result in increasing the level of extractions from rivers, through for example activation of sleeper and dozer licenses
- The amount of water to be traded should be defined in “net” (including return flow impact) rather than “gross” terms to take into account use efficiencies and reflect the actual impact on flows.
- Trading must be assessed both for individual and cumulative assessments to ensure wetland and species diversity is maintained.
- All efforts should be made to identify and pursue opportunities for water trades which will provide environmental as well as economic benefits.
- No trading into an overallocated or overused systems or a high conservation value system

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<sup>3</sup> Young M & McColl J 2002 *Robust Separation-A search for a generic framework to simplify registration and trading of interests in natural resources*, CSIRO

### **Influencing on-farm decision-making**

The CSIRO says 80 per cent of farm profit in Australia comes from just 2 per cent of the national natural resources,<sup>4</sup> and yet a significant amount of money from the public purse is provided to agricultural business struggling in lands which are marginal.

It may be useful for the Commission to consider the effect of policy settings which result in subsidies being directed towards inefficient farming practices, both with regard to physical and economic inefficiencies. Diversion of water resources into unprofitable agricultural practices as a result of drought-relief or other payments has the potential to warp a market-based approach to water use and to hamper efforts to direct scarce water resources towards the most economically productive rural practices.

### **Environmental impacts of increased efficiencies**

WWF considers that it is important to protect the quality of water resources as well as the ecological integrity rivers, wetlands and aquifers by assuring that sufficient flows are retained in the natural water infrastructure. It is also important that the use of water for irrigation not result in adverse environmental impacts on land such as increased salinity or erosion.

The Commission has noted that a central part of the Study is to promote the efficient use of rural water (P.14). While efficiency measures both on and off farm have the potential of increasing the productive use of water, they may also result in positive or negative environmental impacts both in stream and on land, and impact other water users.

Assuming no change in the amount of water extracted for irrigation use, the primary environmental impact of increasing the efficiency of water use is due to reduced groundwater leakage and surface water runoff. These reduced return flows impact both water quality and the quantity of water available for the environment and downstream users.

Young & McColl (2002) suggest that there a fundamental issue of concern in dealing with the impact of return flows. Water available to users in general has been defined in terms of gross (volume pumped) allocations rather than net (volume consumed) flows. This means that as water is traded from less efficient to more efficient users or general efficiency improves river flows will decline with no change in the amount of water allocated to users.

The specific environmental impact of improved water use efficiency will vary from site to site due to factors such as the level of groundwater salinity and distance to the river (for further discussion see Heany and Beare 2003, Young & McColl 2002). Improving irrigation efficiency is likely to reduce

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<sup>4</sup> <http://www.abc.net.au/worldtoday/stories/s347583.htm>



surface water runoff and groundwater leakage. In all cases this would result in a reduction of return flows available for the environment and downstream users. The impact on groundwater salinity and water quality would depend on the characteristics of the site. In areas with high groundwater salinity, a reduction in saline discharge may improve water quality despite a reduction in the volume of water available to dilute in-stream levels of salinity.

In the normal course of business, irrigators will invest to improve efficiency to achieve economic gains. If the government provides incentives to further increase on-farm water use efficiency, it is important that the community benefit from its contribution. Additional water available to farmers should be shared with the community to the extent of its investment and be used to increase environmental flows, improving the sustainability of the water source.

Investment in water use efficiency is currently being funded by the government under the NWI as a method of restoring river flows. However, the cost of achieving the savings relative to the value of the water saved will determine whether implementing water use efficiency measures is the most economic alternative. Studies have shown that there is limited scope for achieving efficiency gains at low cost, with most cost-efficient options already being implemented (see ACIL Tasman 2003).

Further efficiency measures would therefore need to be subsidised to some extent by the government. However, if the government is able to purchase water at a lower price than the cost of achieving efficiency gains then this would be its best economic option. If the community's intention is to improve on farm water efficiency to achieve environmental outcomes then WWF considers it important reducing extractions through purchase irrigator's entitlements also be considered as an alternative.

Because environmental impacts vary from site to site it is important to target incentives for efficiency investments on sites that can achieve both economic and environmental benefits. Using market mechanisms, such as an auction process to prioritise the allocation of incentives for efficiency projects based on well defined economic, social and environmental criteria, may provide an effective basis for targeting the most appropriate sites for efficiency improvements. Site specific information on the environmental impacts of efficiency projects will need to be available to decision makers in order to effectively use market based processes to allocate investment. This may require an investment in additional research by the government.

### **Externalities-Water use efficiency**

As indicated above, there are significant externalities associated with investments in water use efficiency and the impact of these externalities varies depending on the type of investment and the site location and its geographic characteristics. Key externalities related to on farm efficiency are:



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- Impacts on downstream water users through decreased flows and changes in water quality
- Environmental impacts due to water use and changes in environmental flows

Because of the complexity in dealing with these externalities, WWF feels it is important that on-farm efficiency programs be effectively targeted and integrated with catchment management plans. In addition catchment managers must have access to adequate research and technical support in order to properly assess the environmental impacts of efficiency projects. Young & McColl have recommended that water use licences be implemented to deal with the third-party impacts of water use. The water use license would indicate the maximum degree of impact on third parties allowed. Proposed on-farm efficiency projects could only then be implemented up to the point that the third-party impacts are allowed by water use licenses.

### **Management and trading of environmental water**

Although this issue is not central to the Commission's research, WWF's position on managing and trading environmental water and trade between rural and urban sectors may be of interest.

Management of environmental water will be a challenge requiring a significant commitment of skill and resources. Environmental water will need to be managed effectively to achieve defined outcomes, including scheduling of releases and withdrawals. It will be necessary to collaborate with other agencies and conform to requirements of management plans. Additional functions that may be required in the management of environmental water are:

- In collaboration with government and other agencies, determine water needed to restore or protect river ecosystem functions.
- Acquire water permanent or temporary on market to restore river health
- Accept donations of water
- Sell excess water

WWF suggests that the establishment of Environmental Water Trusts may provide an appropriate structure for managing environmental water. Such a trust could act as the legal custodian of the environmental water identified in each water management plan.

The trust will be a not-for-profit body and can receive and manage private donations and contributions from government funds for the purchase of allocated water for environmental purposes.

The trust should be managed by a skill-based board. The board must members should have expertise or experience in any of the following areas: freshwater ecology, water resource management, economics and markets, public administration and environmental law. The membership is to be independent of government agencies.

WWF considers that environmental water should be classed as high security and discretionary, with only discretionary water to be traded:

- High security environmental water is considered essential to meeting basic water quality and environmental requirements, as identified in the water sharing plan. To be set aside prior to allocation of water for consumptive uses (have priority), and may not be used for other purposes.
- Discretionary environmental water (can be allocated from within the pool of water for consumptive uses/tradable water as an additional allocation supplementary to the high security environmental water). Can be traded, and used as a mechanism to restore water to over allocated systems and to meet specified environmental flow requirements.

### **Trade between rural and urban sectors**

The Commission in the past has argued that urban and rural water should be integrated to achieve the greatest economic value, with studies indicating that allowing trade between irrigators and urban users would be beneficial to both parties (Dwyer et al 2005).

As with any trading of water for consumptive use, the relative in-stream and on-ground environmental impacts need to be assessed to determine their advisability from an environmental perspective.

### **International examples of efficiency achievements**

Please find attached Chapter 11 – Aqueous Solutions taken from Natural Capitalism by Paul Hawkin, Amory Lovins and L.Hunter Lovins published by the Rocky Mountains Institute (Attachment 2). This chapter includes examples of international successes on water reduction, which may be of interest to the Commission.

### **References**

ACIL Tasman (2003) “Scope for water use efficiency savings as a source of water to meet increased environmental flows-Independent Review” MDBC

Dwyer G et al (2005) “Integrating rural and urban water markets in south east Australia: Preliminary analysis” OECD Workshop on Agriculture and Water Nov 2005





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Heany A & Beare S (2003) “ Improving Water Use Efficiency, competitive tendering for public investment” *Australian Commodities* Vol 10 no. 2

Young MD & McColl JC (2002) “Robust Separation” CSIRO Land & Water, Adelaide