Water Planning

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Improved regional water planning is the foundation of the National Water Initiative (NWI), which states "water planning is an important mechanism to assist governments and the community to determine water management and allocation decisions to meet productive, environmental and social objectives."

With increasing water scarcity, effective water planning is the mechanism by which communities determine the pool of water available for consumptive purposes, and the environmental outcomes they seek to achieve in their waterways.

In surface and groundwater systems that are already over-allocated or stressed, the NWI commits governments to return them to sustainable levels of extraction, and we must define what this means. The NWI also requires the identification and management of systems of high conservation value.

The NWI provides the foundation for the market to be used to allocate water between competing consumptive uses. It envisages trade between rural and urban, as well as Governments standing in the market place to recover water from willing sellers in over-allocated systems.

The sort of comprehensive water planning envisaged by the NWI is new for Australia, and is being developed in most jurisdictions. While this is still work in progress, there are some key lessons already that are worth considering.

Planning Framework

Regional Planning – Establishing the appropriate planning boundaries can be difficult, since it commonly includes more than one catchment. Where significant water transfers are envisaged it should probably include all of the source catchments as well as those where water will be transferred. This necessitates

recognition of the issues of scale in planning between system (as defined in the NWI) and basin or similar larger management/ planning unit.

Clarify Objectives – Generally plans are developed to meet multiple economic environmental and social objectives. Providing security to existing water users, providing water for future developments and protecting important environmental assets may all be sought. The objectives planned for in any system should be clearly enunciated, as should the actions designed to achieve those objectives.

Connect the Plans – Water planning can not be done in isolation from land use planning, and it is important for water availability to inform where it may be appropriate to site developments. It is also important to ensure regional catchment plans inform regional water plans. Making these various connections is challenging and iterative since plans are commonly developed by different groups at different times.

Engage the Community – Communities seek to ensure water is available for the social, environmental and productive uses that they value. They are likely to have strong views about the priority of planning objectives and about some of the options that might be on the table. Not everyone will get what they initially seek from a water planning process, but it is essential that all feel they have had an opportunity to be involved and have been heard. They expect procedural justice and some equity in the outcomes. They do not expect "outside interests" to dominate the debate and where there are uncertainties, a process of joint discovery may be appropriate. A serious effort to engage the wider community in water planning is a prerequisite to acceptable outcomes.

Supply Side Assessments

Understand Water Sources – The quantity and quality of water from all of the possible surface and groundwater sources needs to be understood, and an assessment made of future reliability given the climatic variability common in Australia. Alternative water supplies from stormwater, recycling and desalination need to be included in this assessment of possible sources, as does inter-basin transfers, possible new dams and purchasing of water from existing entitlement holders. Nothing should be left out of this inventory of possible sources of water on doctrinaire grounds.

Identify Environmental Assets – There will be a variety of high value surface and groundwater environmental assets. These include the river channels themselves, associated wetlands and floodplains and possibly estuarine and coastal waters. The essential ecosystem services to be maintained such as flood control, water supply, fishing, and recreation quality and so on need to be identified. The sort of water regime needed by each asset or service needs to be

estimated. If the system is already over-allocated, what must be done to return it to sustainable level of extraction?

Assess Physical Connectiveness – An assessment of the likely connection between surface and groundwater systems needs to be made.

Estimate of Sustainable Yield – Traditionally this has been done as a hydrological analysis seeking to identify what can be extracted given the likely range of flows in light of the history of climate variability. It is now appreciated that this hydrologic analysis needs to be accompanied by an environmental assessment of existing river health and the likely impacts of water extraction on river health.

Assess Likely Climatic Change – Much of south eastern Australia seems to be now following the south west and appears to becoming warmer with lower rainfall, and markedly lower runoff into rivers. A range of climate predictions are available and need to be considered in water planning. A water plan should also clarify the risks resulting from the projections used and ensure the allocations of the risks between government, users and community is explicit within the plan.

Assessment of Present and Future Demands

Identify Present Entitlements and Actual Use – Identify the actual licences that have been issued and their history of use. What unlicenced water seems to be being used. Identify environmental water available as either licence water or available on the basis of "flow rules." Are there indigenous interests that must be identified and considered under the NWI?

Population Projections – What are the likely population projections for the planning period, commonly 30-50 years? How realistic are they?

Current Per Capita Water Use – Within the planning region, what is the current water use per head? Given the increasing emphasis on water sensitive developments, it might be worthwhile understanding per capita water use for established traditional dwellings and for new dwellings. A per capita use for open space and for industry use is also important.

Future Water Demand Trajectories - The likely future water demand will be affected by climate change if it gets hotter, and also by housing preferences. Presently household size seems to be decreasing, leading to increased per capita usage. The impacts of public education campaigns, incentives for water efficient appliances and water pricing all need to be considered. This is an iterative process and the level of investment will affect the outcome. Setting target water consumption (for dwellings, open space and industry) may guide

the level of investment needed to achieve the outcome desired, and along with the population projection give an estimate of future water needs.

Assessing the Options

Contestability – The data and model used in assessing the options and the science behind various aspects needs to be marshaled and made available as part of the community engagement process. This is so that it can be understood, and where necessary challenged and debated by interest groups.

Technical Assessment – Has sufficient work been done on each of the alternatives to be confident that each is feasible and will reliably provide the water expected? What is the planning and construction lead time?

Economic Assessment – What is the capital and operating cost of the option? What might it mean for water prices?

Environmental Assessment – What environmental assets or ecosystem services might be impacted by the option? Can these impacts be mitigated?

Greenhouse Gas Assessments – What are likely to be the net greenhouse gas emissions from the option?

Social Acceptability – Which groups will be advantaged and which disadvantaged by the particular option. How acceptable is the option likely to be to the whole community, recognising some groups may be more impacted than others.

Reliability of the Knowledge Base – how reliable is the data and the understanding of sustainable yield and the environmental needs of various assets?

Making Choices

Short-listing of Viable Options – In view of the water needs identified, what are the set of most effective and efficient ways of meeting the need with least environmental damage. At this stage, the idea is to screen out from further analysis options that will clearly not meet the objectives of the plan.

Have a Mix of Water Sources – In times of climate uncertainty it is desirable to have a variety of water sources so that if one fails, others are likely to provide security. Desalination and recycling are not dependent on rainfall in the way surface and groundwater systems may be.

Select Appropriate Augmentation Options – Identify a mix of preferred options so as to manage risk, understand the lead times to have them supply water, and identify the trigger points where a decision to proceed must be made. Ensure options identified for later development are protected to ensure they will remain available and suitable for use when required.

Implementation

Accommodating New Uses - In fully allocated systems, ensure that any new developments requiring water are required to get a water entitlement from an existing holder rather than expect they can just reduce the security of supply to existing uses.

Monitoring and Evaluation – A periodic review of how the plan is going is necessary in terms of checking and updating if necessary the sustainable yield estimates, the health of waterway and the demand estimates.

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INTERGOVERNMENTAL AGREEMENT ON A NATIONAL WATER INITIATIVE

Requirements for Water Plans

Issue	Key Element
Statutory water plans	Statutory water plans for surface and groundwater management units in which entitlements are issued involving judgements informed by best available science, socio-economic analysis and community input.
Environmental Outcomes	Plans will secure ecological outcomes by describing the environmental and other public benefit outcomes for water systems and defining appropriate water management arrangements to achieve those outcomes.
Restoration	Implement firm pathways and open processes for returning previously overallocated and/or overdrawn surface and groundwater systems to environmentally-sustainable levels of extraction. Substantial progress will be made by 2010 towards adjusting all overallocated and/or overused systems.
Resource security	Provide resource security outcomes by determining the shares in the consumptive pool and the rules to allocate water during life of plan.
Risk Assignment Framework explicit	Consistent with NWI commitments plans should clarify the allocation between government, consumptive users and the community of the risks associated with variable water supply to facilitate future adaptive management of the plan and its implementation.
Adaptive management	Factor in knowledge improvements and provide regular public reports.
High Conservation	Identify surface and groundwater systems of high conservation value, and manage these systems to protect and enhance those values.
Indigenous interests	Water plans will incorporate indigenous social, spiritual and customary objectives and strategies for achieving these objectives.
Interception	Farm dams and bores; intercepting and storing of overland flows; and large-scale plantation forestry. In fully allocated systems significant interception activities should be recorded (for example, through a licensing system); any proposals for additional interception activities above an agreed threshold size, will require a water access entitlement.
Fully allocated	Threshold size will be determined for the entire water

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	system covered by a water plan, having regard to regional circumstances and taking account of both the positive and negative impacts of water interception on regional (including cross-border) natural resource management outcomes (for example, the control of rising water tables by plantations); and a robust compliance monitoring regime will be implemented.
Not fully allocated	In water systems that are not yet fully allocated, significant interception activities should be identified and estimates made of the amount of water likely to be intercepted by those activities over the life of the water plan and an appropriate threshold level will be calculated of water interception by the significant interception activities that is allowable without a water access entitlement across the entire water system covered by the plan.