



# Socio-economic Assessment Guidelines

for

River, Groundwater and Water  
Management Committees

Independent Advisory Committee  
on Socio-economic Analysis

1998

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## About the Guidelines

River, Groundwater and Water Management Committees are required to consider the socio-economic effects of their water management decisions in the process of developing River, Groundwater and Water Management Plans. The analysis of socio-economic impacts is a challenging task requiring the development of an approach tailored to promote community involvement and progressive feedback.

The Independent Advisory Committee on Socio-economic Analysis has been established to provide methodological advice on the assessment of impacts and to audit the ongoing process of information collection and socio-economic assessment. It has provided its advice to date in the form of these Guidelines which will be incorporated into the *Support Package for River, Groundwater and Water Management Committees*. The Guidelines have been prepared in light of feedback received through consultation on the draft paper which was released on 29 April 1998.

The Guidelines provide River, Groundwater and Water Management Committees with an understanding of how they might carry out a community based socio-economic assessment in the context of the broader water reform process. The framework recommended by the Independent Advisory Committee is designed to assist Committees in carrying out socio-economic assessments in a way which will enhance effective participation in an adaptive process, while ensuring a consistent approach is taken across the State.

The framework proposes a number of steps for profiling the catchment, identifying and assessing the effects of changes in water management regimes, the prioritisation of options, and the presentation of effects in a consistent manner to government and the catchment community. In proposing this framework the Independent Advisory Committee does not envisage that it would be used in a rigid manner, rather it is an indicative sequence of steps which a Committee need not follow in succession. Indeed, a Committee having completed a number of steps may well find that it wishes to 'cycle back' to repeat earlier steps in the light of new information or changed opinions.

The Independent Advisory Committee will provide Committees with detailed methodological advice on a number of the steps in the framework in the form of attachments to the Guidelines. On-going support to the River, Groundwater and Water Management Committees will be provided by the Independent Advisory Committee and its supporting inter-agency working group to ensure credible socio-economic analysis is generated. This support will include such things as the provision of updated information as it becomes available, training or 'skilling-up' of Committee members and their advisors, and expert advice to Committees as required.

## The Framework

Conflicts over water use have been increasing at the same time as there is growing awareness on the part of government, industry and the community of the importance of considering the social and economic effects of policy and management decisions. An understanding of the nature and significance of these impacts is critical in making good water management decisions.

### What is socio-economic assessment?

Socio-economic assessment is a tool used to predict the future effects of policy decisions upon people and can be used to assist people in dealing with change. It provides a better understanding of the scale and distribution of costs and benefits of change and seeks to maximise positive effects and minimise negative effects resulting from this change.

Socio-economic impacts include changes that occur in:

- people's way of life (how they live, work and interact with each other);
- their cultural traditions (shared beliefs, customs and values);
- their community (its cohesion, stability, character, services and facilities); and/or
- their standard and quality of life (level of income, ranges of choice in consumption and the quality and quantity of community infrastructure).

Socio-economic assessments measure the broad range of effects which may arise from changes in policy or practice. These effects may be broken into three key categories - economic, social and environmental. Economic effects refer to changes in well-being, regardless of whether these changes are reflected in monetary flows. Social impacts refer to changes in community cohesion, vitality, confidence, and the demographic make up of local and regional communities. Environmental effects refer to changes in environmental quality. Balanced decision making requires the integration and explicit recognition of social, economic and environmental impacts.

There is a range of methods available to assess the socio-economic effects of change. It is not possible, however, to establish a single method to apply in all situations because the nature and impact of water management decisions will vary from catchment to catchment. These Guidelines and subsequent papers being prepared by the Independent Advisory Committee provide guidance on how to undertake a credible socio-economic assessment.

The Committee believes these principles will ensure best practice and has developed them to account for the Government's commitment to making natural resource management decisions in partnership with communities. In preparing this advice, the Independent Advisory

Committee has built upon the principles contained in *NSW Government Guidelines for economic appraisal* and *The Cabinet Office Guidelines for Assessing Social Impacts*.

### What is community based socio-economic assessment?

Consistent with the Government's approach to water reforms, the Independent Advisory Committee recommends a community based framework to assess the socio-economic effects of change in water management regimes.

Community involvement is critical in identifying potential issues, differing values, opportunities and constraints, and available alternatives at a catchment level. Further, policy changes affecting water management regimes will benefit from evaluation of likely impacts (both positive and negative) on relevant communities.

A community based approach provides a mechanism for tapping into local knowledge and ensuring that the views of affected people are picked up and incorporated into the decision making process. Ideally a community based approach should result in decisions and plans which the community feels it 'owns'.

Community based socio-economic assessments are:

- community centred;
- integral to the planning and decision making process;
- issues based;
- participatory and open;
- pro-active in identifying alternatives and options;
- adaptive and interactive; and should
- acknowledge local expert knowledge; and
- accommodate conflict identification and negotiated outcomes.

Assessing socio-economic dimensions in this manner is considered best practice because it leads to more effective decision making and greater support for these decisions by communities.

The steps proposed for carrying out a community based socio-economic assessment are outlined in the following section.

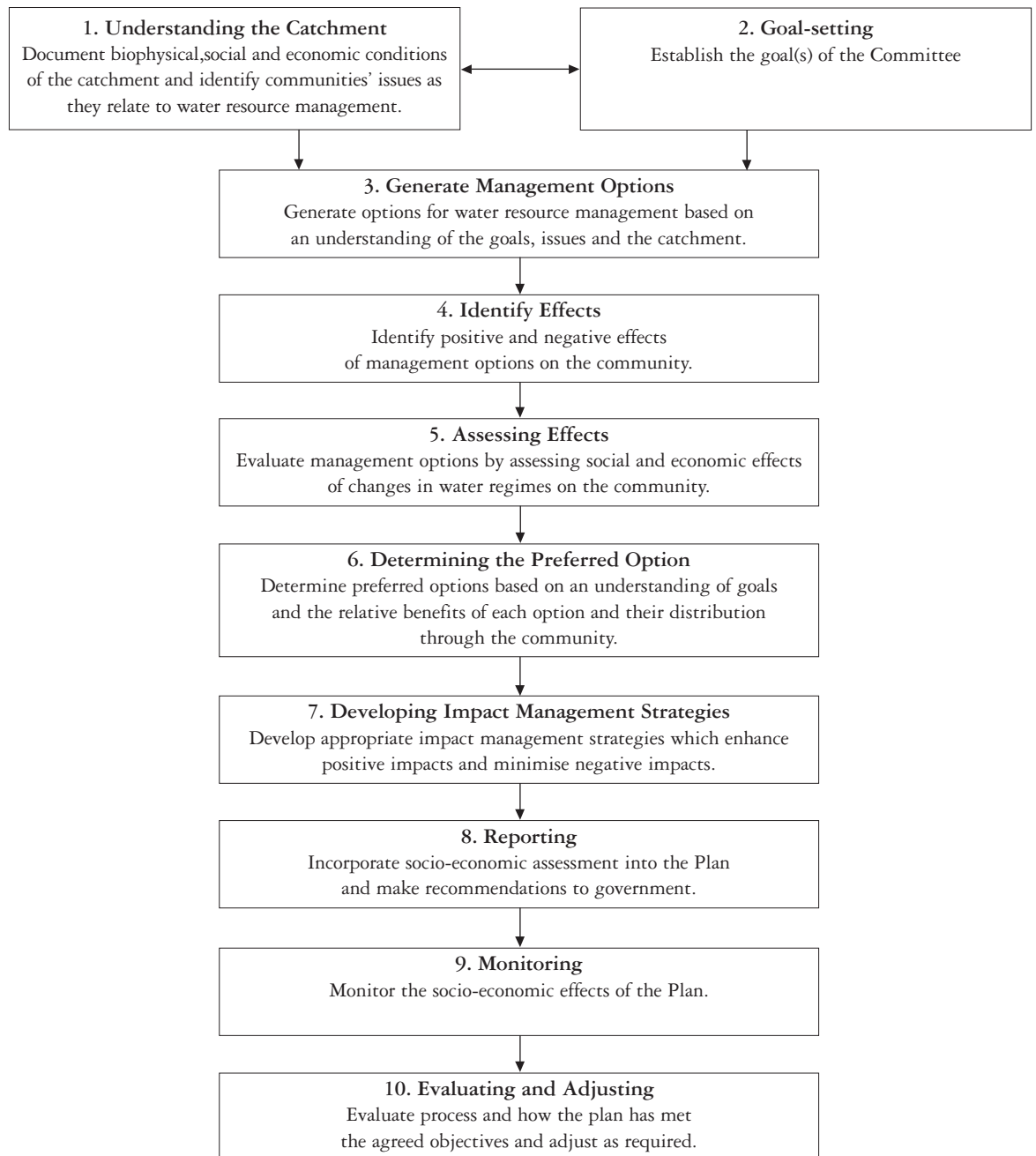
### The steps in a community based socio-economic assessment

The 10 steps of a community based socio-economic assessment framework are outlined on the following page. It is consistent with the planning steps contained in the *Support Package for River, Groundwater and Water Management Committees* which facilitates integrated planning.

The steps are designed to promote the development of a consistent and transparent assessment process. They also provide the flexibility required to consider the issues and impacts of particular significance to individual catchments.

Importantly, the framework has been designed so that most of the steps can be completed by the Committees themselves. In situations where the Committees identify the need for detailed socio-economic studies requiring the use of consultants or agency staff, some resources will be available for the analysis.

## Steps in a community based socio-economic assessment



## Applying the Framework

Community based socio-economic assessment will initially be used in predicting the effects of alternative management options. It will subsequently be used to monitor and evaluate the actual effects of the changes in water management implemented in the previous planning cycle. Such information will be important in assisting River, Groundwater and Water Management Committees modify and improve decisions regarding management of river or groundwater systems in the next planning cycle.

In this way, socio-economic assessment will perform the important function of helping Committees and their communities learn, over time, better ways of managing the water resources in their catchment.

### Getting started

Prior to commencing the socio-economic analysis, Committees will need to ensure that they:

- understand their obligations and responsibilities;
- develop a community involvement plan; and
- develop an agreement on the accountability of the Committee to the wider community.

Committees, if they haven't done so already should refer to the *Committee Function and Communication Strategy* sections of the *Support Package for River, Groundwater and Water Management Committees* for further information on 'getting started'.

At this stage it is also useful to assess the amount of time and level of resources available for the collection and analysis of socio-economic data. Limited time, data and financial resources will require Committees to choose the most important issues to address, and data to collect. The Committees will need to identify the resources available to them, how to access those resources, and how to work within the constraints imposed by them.

### Step 1: Understanding the catchment

Catchments are dynamic and are continuously experiencing change. It is therefore important that, before options about future water resource management can be developed, Committees understand the catchment and have some appreciation of the communities' ability to absorb change.

This is also a critical step in the broader river and groundwater management planning process and Committees should refer to the *Process in Making a Plan* section of the *Support Package for River, Groundwater and Water Management Committees* to clarify the types of bio-physical data they should collect.

Understanding your catchment involves:

- developing a community water profile for the catchment;
- identifying the sources of change which have shaped the catchment through the development of past and present 'pictures' of water use and water users; and
- identifying key issues in relation to water.

Develop a community water profile

The focus of the community water profile is to assemble existing key socio-economic data which will enable committees to obtain a general picture of their catchment in terms of its socio-demographic and economic structures. This exercise also aims to provide committees with information on the types of water use in the catchment and a brief profile of the water users.

The data which could be collated to develop a community water profile includes:

- brief description of the socio-economic characteristics of the catchment and how they have changed over time. This may include:
  - brief history of region;
  - population within catchment;
  - age structure and education levels;
  - employment and income levels;
  - major industries and sources of employment; and
  - community infrastructure (eg. health, education).
- profile of water use in the catchment. This could include:
  - information on water resources;
  - types of water use (extractive and non-extractive) in the catchment;
  - perspectives on water use by major water use groups; and
  - information on water users and the social and economic contributions to locality and region.

Committees should refer to Attachment 1, *A Community Water Profile Pro-forma*, for further information to assist them in the completion of this step. The inter-agency working group will assist Committees in this task.

### Identifying the sources of change in the catchment

The development of the past and present 'pictures' can be achieved by referring to the data sources utilised in the above step and by drawing on local knowledge.

From these 'pictures', River, Groundwater and Water Management Committees can identify current trends in the catchment, explore the reasons for trends and changes which have occurred in the past and identify likely future changes.

### Identifying key issues

To focus the socio-economic analysis, and assist in the generation of management options which are acceptable to the community, it is necessary for River, Groundwater and Water Management Committees to understand community, industry and water use issues and concerns in relation to the water reform process. Refer to section 2.3 in Attachment 1, *A Community Water Profile Proforma*, for further information on water use perspectives of major users in the catchment.

To identify key issues, Committees will need to have a good understanding of ecological processes and the relationship between water and the community. For the planning process, it is useful to focus on those issues which are expressed as a conflict or a trend away from desirable outcomes.

Committees should refer to the *Process in Making a Plan* and the *Writing a Plan* sections of the *Support Package* for further information on defining issues.

### Outcomes of the Step

This step provides Committees with:

- a better understanding of their catchment in terms of socio-economic structures;
- a better understanding of the role of water in the catchment;
- a better understanding of the sources of change in the catchment and the capacity of the catchment communities to absorb change;
- a better understanding of the key issues for the catchment in relation to the water reform process; and
- the basis for assessing and monitoring socio-economic effects of new water management regimes.

#### Quality Assurance Standard

*That all uses of water are listed and key issues identified.*

Both extractive and non-extractive uses of water should be considered in this process.

### Step 2: Goal-setting

River, Groundwater and Water Management Committees will need to set their social and economic goals in a similar manner employed when they set their environmental goals (refer to the *Process in Making a Plan* section of the *Support Package*).

Goals should reflect a set of values that the community and the NSW Government are prepared to accept as being appropriate for the analyses.

Goal setting involves:

- understanding the Government's goals and objectives;
- understanding the community's expectations in relation to the water reform process; and
- appreciating the community's aspirations and concerns for the future.

### Understanding Government's goals and objectives

Review the Government's goals and environmental objectives in relation to the water reform process. The *Process in Making a Plan* section of the *Support Package* will assist you with this.

### Understanding the community's goals

Committees should obtain an understanding of the community's goals to ensure that their values are embraced within the Committee's goals.

It may be useful at this stage to consult directly with sectors of the broader community in the catchment if their views have not been represented adequately on the Committees, or if there are significantly conflicting views held within sectors of the community, or between Committee members, which cannot be resolved or negotiated.

A goal of a River, Groundwater or Water Management Committee to guide the socio-economic assessment may be:

*'achieving the best balance of the benefits and costs of water reforms for the communities in our catchment'*

The reference to 'balance' in the above goal recognises that the proposed changes will:

- have both benefits and costs;
- be manifested and measured in a number of ways (social, economic, and environmental); and
- have benefits and costs which are likely to be unevenly distributed over time and over different groups in the community.

A number of more precise sub-goals could then be derived from this broad goal.

### Outcomes of this Step

This step provides Committees with:

- an understanding of similar and differing goals within the community and between the community and the Government; and
- an understanding that the goals will provide a basis for generating and evaluating management options for socio-economic assessment.

#### Quality Assurance Standard

*That the key objectives have been listed, and each option tested against the objectives for its performance. Both Committees' and Government's objectives should be considered in this process.*

**Step 3: Generating management options**

More than one management option will need to be identified for each of the elements under consideration to ensure that an adequate range is considered. The *Process in Making a Plan* section of the *Support Package* will assist you with this.

Generating options involves:

- taking into account the social, economic and bio-physical characteristics of the catchment; and
- considering the key issues and the goals of the Committees.

**Outcome of this Step**

This step provides Committees with a range of options which provides the foundation for subsequent socio-economic assessment.

**Quality Assurance Standard**

*That a range of alternative options has been specified.*

**Step 4: Identifying effects**

Identifying effects of water management options generated by a River, Groundwater or Water Management Committee involves examining all the effects associated with alternative options from a number of perspectives, including:

- effects on different uses (both extractive and non-extractive) of water;
- effects on different population groups, such as low income families, Aboriginal communities, or the aged;
- effects on different industry sectors;

- effects on different communities (eg. geographical, occupational); and
- effects over time (short-term versus long-term) and locations (local versus regional, upstream versus downstream).

Identifying effects involves:

- identifying the effects (positive and negative) on extractive and non-extractive categories of water use for each option; and
- identifying the socio-economic effects on different groups in the community for each option.

**Identify effects on extractive and non-extractive uses of water**

To understand the effects of changes in water management regimes it is important to first determine which categories of water use may be affected (both positively and negatively) by changes in water management under each of the options generated. By understanding which categories of water use will be affected by the different management options, Committees will be able to identify the social, economic, financial and environmental effects on the broader society and flow-on effects within the region.

It is important that Committees identify effects on both extractive and non-extractive uses of water, of different water use options.

Table 1 below provides an example of one way Committees may wish to identify which categories of water use may be affected by changes in water management regimes.

**Table 1: An example table of effects of proposed options by categories of water use**

Categories of water use	Management Options					
	Option	Option	Option	Option	Option	Option
Irrigated agriculture						
Other agriculture						
Domestic water supply						
Tourism						
Other industry						
Recreation						
Aesthetic*						
Ecological						
Vicarious**						
etc						

\* Aesthetic values include the experiential attributes that a river environment provides (eg. visual amenity).

\*\* Vicarious uses of water include values which are derived by people from the knowledge that something is available for use by themselves or others, either now or in the future (eg. option, existence, bequest values).

### Identify socio-economic effects

Once committees have identified the effects that changes in water management regimes will have on different categories of water use, they will need to ask themselves what social and economic effects will likely occur if the options considered were implemented.

Identifying the socio-economic effects of changes in water management regimes is not easy. Some effects, such as employment, may be obvious while others, such as shifts in power balance between local groups, may be harder to discover. Obviously, immediate effects will be more visible than delayed social effects and tangible effects will draw more attention than intangible ones.

In any case, a generic list of questions for consideration is helpful in assisting to identify the socio-economic effects which may arise from the proposed changes in water management regimes. Even if it is proven impossible to determine the strength and the timing of an effect, simply being aware of its existence gives an increased sense of control and confidence in the decision process.

The potential consequences of implementing different water management options could be identified by focused and facilitated discussions with potentially affected groups. On the basis of these discussions, and reference to the generic list of questions, it should be possible to arrive at a number of 'if - then' statements which describe the more important anticipated social and economic consequences of each scenario. These are sometimes called 'impact trees'.

The following is a very simplistic example of how an 'if ... then' scenario may be used to obtain a better appreciation of the nature of the effects.

- If the frequency of algal blooms falls as predicted, then the cost of water treatment is also expected to fall by **X** per cent, and the use of the waterways for recreational purposes is likely to change in the following ways ...

At this stage it is also important to document any other factors (ie. trends in commodity markets, Asian crisis) which may be contributing to changes in the socio-economic environment of the catchment.

### Outcome of this Step

This step provides Committees with:

- an understanding of the nature of the effects associated with each of the options; and
- how they are distributed across the range of water uses in the catchment.

#### Quality Assurance Standard

*That the full range of both financial and non-financial effects of each option have been identified and considered, including flow-on effects. The list of possible effects which the Independent Advisory Committee has developed provides a good basis for starting this process.*

**Table 2: Questions for consideration to assist in identification and analysis of socio-economic effects of changes in water management regimes**

Primary matters	Specific considerations
Financial effects on direct users	<p>Will the proposed changes affect:</p> <ul style="list-style-type: none"> <li>• resource allocation and productivity?</li> <li>• expenses?</li> <li>• gross income?</li> <li>• profit levels?</li> <li>• cash-flows?</li> <li>• industry confidence?</li> <li>• investment opportunities?</li> </ul> <p>If yes, describe how.</p>
Financial and employment effects in the catchment	<p>Will the proposed changes affect:</p> <ul style="list-style-type: none"> <li>• the number of jobs in locality and catchment?</li> <li>• the types of jobs (casual, full-time, part-time, skilled, unskilled)?</li> <li>• job stability?</li> <li>• income levels?</li> <li>• expenditure patterns of affected industries and households?</li> <li>• existing and future businesses?</li> <li>• industry/commercial diversity?</li> <li>• access to opportunities?</li> </ul> <p>If yes, describe how.</p>
Financial and employment effects outside the catchment	<p>Will the proposed changes affect communities or economies outside the catchment?</p> <p>Are these effects likely to be positive or negative, and are they likely to be significant?</p> <p>Will the proposed changes lead to greater efficiency of water use and higher economic return?</p> <p>If yes, describe how.</p>
Effects on socio-demographic structure	<p>Will the proposed changes affect:</p> <ul style="list-style-type: none"> <li>• population levels in locality and catchment?</li> <li>• age structure of the population?</li> <li>• distribution of income within population?</li> <li>• education levels in population?</li> <li>• rate of unemployment?</li> <li>• crime rate?</li> </ul> <p>If yes, describe how.</p>
Effects on community and institutional structures	<p>Will the proposed changes affect:</p> <ul style="list-style-type: none"> <li>• in- or out- migration of businesses?</li> <li>• government services (eg. health, education, transport)?</li> <li>• voluntary community services and associations?</li> <li>• leisure opportunities</li> <li>• ( ie. will change provide new recreational/leisure opportunities)?</li> <li>• character of community?</li> </ul> <p>If yes, describe how.</p>

Primary matters	Specific considerations
Effects on community vitality and well-being	<p>Will the proposed changes affect:</p> <ul style="list-style-type: none"> <li>• the social cohesion in the community?</li> <li>• the level of issues that unite the community?</li> <li>• the level of group conflict in the community?</li> <li>• the level of public participation in a community?</li> <li>• degree of pride in the community?</li> <li>• residential stability and desire to relocate?</li> <li>• family and friendship networks in the community?</li> <li>• public health of the community?</li> <li>• community members' trust in political and social institutions?</li> <li>• level of dependence on social security and other social welfare programs?</li> </ul> <p>If yes, describe how.</p>
Effects on heritage values	<p>Will the proposed changes affect:</p> <ul style="list-style-type: none"> <li>• the heritage significance of items, landscapes, areas, places, relics and practices?</li> <li>• sites of Aboriginal, non-Aboriginal and natural heritage (historic, scientific, social, aesthetic, anthropological, cultural, spiritual, archaeological)?</li> <li>• cultural, spiritual or historical activities?</li> <li>• alter the traditional land use patterns?</li> </ul> <p>If yes, describe how.</p>
Effects on environment *	<p>Will the proposed changes affect:</p> <ul style="list-style-type: none"> <li>• maintenance of biodiversity?</li> <li>• water quality and pollution of water bodies including groundwater?</li> <li>• the health of wetlands?</li> <li>• habitat for native fish and vegetation?</li> <li>• riparian and in-stream vegetation?</li> <li>• bank stability and soil erosion?</li> <li>• weeds, alien species, feral animal activity, vermin and disease?</li> <li>• increase efficiency of water use?</li> </ul> <p>If yes, describe how.</p>

Note: \* Refer to Support Package for River, Groundwater and Water Management Committees to assist you in identifying the potential environmental effects of proposed changes in water management regimes.

### Step 5: Assessing effects

The assessment of effects may be analysed in two phases - preliminary assessment and detailed assessment. The first phase assesses the impact trees developed in Step 4 and further defines the characteristics of the different options. This process should help to determine if socio-economic effects are significant. Where this is the case, a more detailed examination of socio-economic effects should follow.

The second phase of assessing effects should provide a greater level of detail of the significance of those anticipated effects which River, Groundwater and Water Management Committees have identified as important.

During both of these phases, River, Groundwater and Water Management Committees will be comparing the different reform options in terms of how these options deliver different types and levels of benefits, and also the types and level of costs that are involved in achieving these benefits. Committees will need to organise this information in a way which recognises that the effects will be felt by different groups, at different times, and in different forms.

Effects may have several dimensions, such as:

- extent of effect (eg. localised or across region);
- likelihood of effect occurring;
- intensity of effect; and
- timing and duration of effect.

In addition, there may be some attributes of the catchment and the catchment community (such as amenity benefits of changes in flow rules) which are affected by particular management options, but for which it is not possible to determine whether these attributes would be positively or negatively affected. These factors, however, should still be recognised and noted.

River, Groundwater and Water Committees are expected to observe general principles relating to how they organise the benefits and costs of each option. These principles are outlined in the Independent Advisory Committee's paper, *Techniques for the Analysis of Potential Impacts of Water Reform*.

One of the important principles regards the need to determine a base-case to which the reform options being considered can be compared. The effect of a particular option is the difference between the socio-economic condition of the region under that option and the socio-economic condition of the region under the 'without water reform' scenario.

#### Describing the situation if no changes in water management occur

It is not usually valid simply to assume that the future socio-economic condition of the region under a 'without water reform' scenario will be equivalent to the current

socio-economic condition of the region. Current trends are likely to persist, regardless of water reform activity.

It is acknowledged, however, that predicting the future socio-economic condition of the region under a 'without water reform' scenario may be difficult. However, Committees should make every attempt to sketch in the 'without water reform' scenario as realistically as possible on the basis of their informed expectations.

A good starting point for describing what the environmental, social, and economic consequences will be in the future if nothing is done to change water resource and land management is the data on the current socio-economic condition of the region developed in Step 1. However, it is unlikely to be enough, and future 'pictures' will need to be developed by drawing upon past trends and the sources of change identified in Step 1.

The 'no water reform' scenario provides a common reference point, or baseline, for comparison of diverse management options and evaluation of net impacts. It is needed to justify the Committee's preferred management option and to provide a basis for evaluating options.

#### *Preliminary assessment*

Preliminary assessment of effects principally involves comparing the relative effects of the options. That is, in the initial consideration of the alternative options it is much more efficient to consider the effects of the options relative to the other options rather than by attempting an absolute quantification of the effects of each option. By comparing the relative effects of the various options and the 'without reform, scenario, it should be possible for Committees to screen the options, and determine which options and effects require further consideration.

River, Groundwater and Water Management Committees should not underestimate their knowledge and ability to complete this preliminary assessment stage with relative independence. Simple techniques such as considering trends, directions of change and basic scoring and ranking processes can be very useful in identifying the relative merits of the alternative options.

For each of the options it may also be useful to summarise the characteristics of the effects, and present them in a manner that facilitates comparison between options (see Table 1 for an example).

This process should also help determine if the socio-economic effects of those options screened for further consideration are significant. Where this is the case, a more detailed examination of social, environmental and/or economic effects should follow. Resource and time considerations require that the detail of the analysis should be only to the level which is essential for effective decision making.

**Detailed study**

If a River, Groundwater or Water Management Committee has decided that further socio-economic analyses are required to assess certain potential effects prior to decision making, for each problem or issue that has been identified/defined, it will need to:

- clearly state the key assumptions underlying the proposed study;
- consider the key quality assurance principles in defining the study;
- identify an appropriate method of analysis and the tools and techniques to be utilised; and
- identify appropriate sources of data to collect.

Such detailed analysis will probably require Committees to call on NSW Government agencies and consultant based technical skills.

**Clearly state key assumptions**

All analysis involves assumptions and their clear identification is important. Assumptions are the 'state of nature' on which planners/scientists base their analysis. Those who are using the results of the analysis need to understand clearly what this basis is.

The appropriateness of assumptions may be checked by reviewing past studies, considering how industries, production systems, and community infrastructure might change as a result of the options, and by comparing these responses with past experiences to see if they are consistent. These assumptions may vary geographically across the catchment, and over time.

**Considering key quality assurance principles**

In addition to clearly stating key assumptions it is important to consider the following key quality assurance principles:

- *Focus assessment effort on important factors*  
The study should focus on key factors which are important rather than on what is easy to assess. Committees will need to ensure that the key factors which affect the outcomes of the different management options are identified.
- *Ensure short term, long term and cumulative effects are considered*  
The socio-economic effects of management options may be short or long term. Cut off points and assumptions about duration of effects included in the study should be identified. Strategies to assess the cumulative effects of the proposed management options should be identified.
- *Ensure equity is considered*  
Equity embraces notions of social justice, fairness and more equal distribution of resources, income and wealth. It is important to consider equity issues in assessing socio-economic effects and choosing the appropriate techniques and tools.

Intergenerational effects are particularly hard to identify and assess. In the absence of well-defined techniques to consider intergenerational effects, the key issue to address is the extent the effects, positive and negative, are reversible.

- *Undertake sensitivity analysis on effects where risk is significant*  
Impact assessments of proposed management options will always carry a level of uncertainty. It is important to identify the range of outcomes which could result from the proposed management options, however, analysis should focus on the most likely scenario.

Sensitivity analyses can be used to indicate the possible implications of less likely but more extreme outcomes. In some instances the significance of risk may justify the use of more complex techniques of risk analysis.

- *Refine relative estimates of sensitive socio-economic effects if quantification is difficult*

In many socio-economic impact assessments, issues on which information is difficult to quantify are often overlooked or ignored. It is important that non-quantifiable effects be explicitly identified and their significance described. This concern is particularly important when considering environmental and quality of life issues.

**Identify appropriate methods and techniques**

The characteristics of the problems and issues to be analysed are so diverse we cannot encompass them all in this paper. Similarly, a truly comprehensive review of the possibly relevant methods for analysis would be equally wide ranging.

The Independent Advisory Committee's paper, *Techniques for the Analysis of Potential Impacts of Water Reform*, reviews a number of techniques/tools which are applicable to addressing some of the key issues which are likely to be common across catchments. These include issues such as the effects on irrigated agricultural production, environmental values, and regional communities due to flow-on effects. The paper also provides information on recent water related socio-economic studies, and relevant manuals which provide detailed information on various techniques.

This paper should be seen as a starting point in considering what techniques and tools to use to assess effects. However, there will be many issues which River, Groundwater and Water Committees identify as requiring more detailed analysis, which are not covered by this paper. The Independent Advisory Committee recognises that the only effective means of satisfying the need for focused advice on these issues, is through on-going liaison with Committees.

In all cases however, the selection of methods to use should conform to five simple rules:

- the methods should produce the type and precision of information that Committees need in order to make informed decisions;

- cost and time considerations dictate that the methods employed should be no more complex than is necessary to get the required result;
- the methods must be matched to the attributes of the problem being analysed;
- the Committees and the stakeholders should be confident about the validity of the method chosen, as trade-offs are to be based on the results of their use; and
- the objectives of the analysis should be understood and agreed by the Committees and the stakeholders, and used as an overarching guide for planning throughout the exercise.

**Identify appropriate sources of data to collect**

The diverse effects of the options and their analysis are likely to generate a wide range of data requirements. The kinds of data sought will be suggested by the nature of the anticipated consequences identified and the techniques that have been chosen to evaluate them.

Above all, given the limitations of data, time and money, Committees should focus on collecting data which has been highlighted as important in the assessments.

**Outcomes of this Step**

- The purpose of the preliminary assessment phase is to screen management options for further consideration and to evaluate what further analysis is required (if any).
- The detailed assessment phase provides a clear account of the effects (social, economic, and environmental), the techniques used and the key assumptions.

**Quality Assurance Standards**

- *That the 'without reform' situation has been specified.* This outlines what the catchment situation would be if the reform element did not proceed, and is what the effects of the other options are compared against. The 'without reform' situation reflects the fact that without water reform the catchment will still continue to change, due to a raft of influences including changing technology, environmental alteration, social attitudes, and economic signals. The 'without reform' situation is therefore not the same as the current situation of

- the catchment, and it is not acceptable to compare the 'with reform' options with the current situation in determining the effects of the reform options.
- *Consistency between the base which is used in analysing the effects of alternative options, and of environmental, social and economic components of those effects.* This includes consistency in the base data, and the period of time over which the effects are evaluated. Special attention must be given to the choice of appropriate geographic boundaries.
- *That there is agreement within the Committees on the effects which have been chosen for further evaluation,* due to their critical importance for decision making about the options. Often this would require justification of what is excluded as well as what is included.
- *When socio-economic analysis is undertaken, that the most affected stakeholders are identified, and their concerns noted.*
- *That the assumptions of the analyses have been listed, and that sensitivity analysis has been undertaken for each of the key assumptions, and on assumptions where there is significant uncertainty or disagreement.*
- *Choice of technique for analysing effects.* Why chosen. We will be indicating techniques which are suitable for a range of problems (financial and non-financial), and will be available to provide advice for particular circumstances. If a less conventional technique is chosen, the reasons for this choice should be made clear, ie. the nature of the problem, the availability of necessary data etc.

**Step 6: Identifying the preferred option**

Once the gains and losses of the selected options and their distributional impacts have been identified and assessed, River, Groundwater and Water Management Committees can effectively consider the relative merit of the options in order to select a preferred option. In some instances, Committees may want to identify more than one preferred option.

Prior to identifying a preferred option, the information generated during the identification and assessment of impacts steps should be displayed in a manner which facilitates the evaluation of the relative merits of the options considered.

**Table 3: An example of an impact display table**

Effects	Definition of effect	'Without' option	Option A	Option B	Option C
I					
II					
III					
IV					
V					
VI					

In addition to displaying the information on the effects of each option, Committees may find it useful to formally recognise the objectives of the Committee and the catchment community in the decision making process. This might be achieved by either applying weights that determine the rate of trade-off between different effects, or by setting minimum or maximum levels of change which the community is willing to tolerate (similar to 'safe minimum standard' approaches). Information on these and other techniques which are useful in determining the most appropriate management option will be provided by the Independent Advisory Committee in a separate document.

Determining a preferred option and ranking alternatives should be based on criteria which reflect:

- the desired outcomes and goals of the Committees;
- the social, economic, financial and environmental effects of each option;
- the time and cost of implementing the option; and
- the possibility of implementing the option under current legislation and policies.

These criteria should focus on community net benefits and distributional impacts on areas of concern, and the capacity for mitigation of adverse effects. They should also consider issues such as equity, environmental objectives, and risk and uncertainty.

River, Groundwater and Water Management Committees should refer to the *Process in Making a Plan* section of the *Support Package* when they reach this step.

#### Outcomes of this Step

- Identification of a preferred option which is most likely to achieve the best balance of benefits and costs of the water reforms for communities in the region.
- A basis for generating an impact management strategy.

#### Quality Assurance Standards

- *That risk and uncertainty have been analysed.* Recognition of the role of risk in decision making. Different levels of risk will be associated with alternative options. There is an expectation that trade-offs will occur between risk and return, where higher returns are required to compensate for higher levels of risk.
- *That equity considerations have been analysed.* Effects of the options will vary not only in terms of the total effect, but in how the effects are distributed through the community in spatial and demographic terms, and through time (including intergenerational effects).
- *Statement of how the results of the analyses were confirmed within the Committees and the broader catchment community.* Techniques, processes, availability of information prior to decision etc. Was the outcome supported by consensus agreement of the Committee.
- That the reasons for final decisions on management options are clearly articulated.

#### Step 7: Developing impact management strategies

In some instances impact management strategies, or mitigation options, may be required to minimise the negative, and enhance the positive effects of the preferred water management option.

It is important to note that impact management strategies need not be restricted to seeking resources from Government. Locally developed and resourced impact management strategies are often the most effective at targeting resources to those sectors and groups of society which bear the cost of the change.

#### Step 8: Reporting

River, Groundwater and Water Management Committees have reporting obligations in two main areas - to Government and to the community. Reporting provides the mechanism for influencing policy and developing the water reform process at all levels. Committees should refer to the appropriate sections in the Support Package to obtain information on their reporting requirements to Government and the community.

Committees should provide reports on:

- community water profiles;
- detailed socio-economic analysis studies undertaken by agencies and/or consultants;
- interim plans;
- recommendations on interim water flow and water quality rules; and
- River, Groundwater and Water Management Plans.

The Independent Advisory Committee on Socio-economic Analysis will review detailed socio-economic analysis which Committees undertake and the socio-economic components of their interim plans or final plans. The Independent Advisory Committee encourages River, Groundwater and Water Management Committees to submit terms of reference and proposals to undertake detailed socio-economic studies to them for review. They will review the proposals to ensure that the approach and methods used are appropriate and will lead to credible findings.

#### Steps 9 and 10: Monitoring, Evaluation and Adjustments

Ongoing monitoring, evaluation and adjustment will be important as the River, Groundwater and Water Management Plans are implemented. Committees will need a strategy to ensure this occurs in a way which continually informs the community and Government. Monitoring of new water management regimes and associated actions:

- provides an ongoing picture that allows the Committee and Government to determine whether implementation is progressing as planned. It may also show when activities are not leading to agreed objectives or when the community and the Government are not satisfied with its implementation, so that early adjustments can be made;

- provides an 'early warning' which identifies unanticipated problems at an early stage. Solutions can be sought before the problems get out of hand;
- provides continuous feedback throughout the planning process and beyond to ensure that the quality of the actions is sufficient to provide good results;
- ensures that resources are used more effectively by showing what is required to produce a certain effect, or how necessary resources can be distributed differently to get a better effect; and
- can be used to verify and improve the accuracy of socio-economic impact predictions.

The main purpose of monitoring new water management regimes is to provide information during the water reform planning process so that adjustments and/or modifications can be made if necessary. Feedback gives the plan life by providing opportunities to adaptively respond to more information.

In the water reform planning process there are opportunities for committees to implement early actions and interim plans and monitor them prior to the finalisation of their Plan. This experience will provide committees with valuable information for the development of a monitoring strategy as part of their Plan.

Monitoring may be defined as control activity involving the measurement of change(s). Monitoring is generally seen to involve:

- reviewing of objectives and actions;
- developing monitoring questions;
- identifying key factors or variables to be monitored;
- identifying information sources and tools;
- establishing on-going consultation process; and
- evaluating and adjustment.

#### Review objectives and actions

Prior to developing a monitoring strategy it is critical that Committees review the agreed objectives and the actions that have been implemented. This will provide a basis for focusing the monitoring activities on the things that matter most to the committees. In doing this, the Committees will be able to report on whether implementation is progressing as planned and whether the agreed objectives and the community's and Government's satisfaction with the outcomes are being met.

#### Generating monitoring questions

After objectives and activities are reviewed, committees should discuss the information needed to help them know if actions implemented are meeting the objectives. It is useful to focus on the questions: "What do we want to know?" and "What do we monitor that will tell us this?"

Monitoring questions should be generated around the agreed objectives and goals of the Committee and should

focus on the key areas of concern which were identified in Steps 4 and 5 of the Guidelines.

For example, a Committee may have identified in the socio-economic assessment process that the two issues of significant concern are job loss in the catchment and decline in community cohesion. In developing a monitoring strategy for the implementation of new water management regimes a committee may generate monitoring questions such as:

- Will changes in water management regimes affect employment levels in the region?
- Will changes in water management regimes affect community cohesion?

There should be agreement by the group on each monitoring question. If many questions are generated they can be ranked in order of importance. Monitoring activities should focus on those questions which are of greatest significance to the Committee.

#### Identify key factors or variables to be monitored

For each monitoring question, the Committee will need to focus on the question of "What do we monitor that will answer this question?". This type of questioning allows the Committee to generate, with assistance from experts, the indicators that will answer the monitoring questions.

Key indicators are essential pieces of information that open doors to understanding. Indicators can be compared to road signs. Road signs give information that tell the traveller how far it is to a certain town. The traveller can then estimate the time it will take to get there.

Establishing indicators for some monitoring questions will be relatively easy. For example, if information on employment levels is required, the number of people employed should be measured. Establishing indicators for other monitoring questions, such as loss of community cohesion, is more difficult. Community cohesion is considered to result from, and depend on, high levels of commitment on the part of residents to the community, intensity of social interaction, shared values and a certain degree of homogeneity regarding socio-economic considerations. For example, if Committees wish to monitor community cohesion they would need to examine things such as kinship and friendship ties, interaction with neighbours, resident involvement in community groups, and resident reliance on local services.

The table below illustrates the link between the monitoring questions used as examples in the above section and the indicators discussed here.

Table 4: An example of monitoring questions and indicators

Monitoring Questions	Indicators	Sub-indicators
1. Will changes in water management regimes affect employment levels in the region?	<ul style="list-style-type: none"> <li>• Level of employment</li> </ul>	Number of adults employed (full-part-time and casual)
2. Will changes in water management regimes affect community cohesion?	<ul style="list-style-type: none"> <li>• Kinship and friendship ties</li> <li>• Interaction with neighbours</li> <li>• Resident involvement in community groups</li> <li>• Resident reliance on local services</li> <li>• Satisfaction of place</li> </ul>	<ul style="list-style-type: none"> <li>• Number of closest friends in community</li> <li>• Number of relatives in community</li> <li>• Number of visits to neighbours</li> <li>• Number of times help or receive help from neighbours</li> <li>• Membership in community groups</li> <li>• Extent of reliance on local services (ie groceries, petrol, banking, doctor)</li> <li>• Level of satisfaction with place</li> </ul>

Establishing good indicators may take some time, but experience shows that this is time well spent. Three important questions to be answered are:

- What do we want to know?
- What are the many pieces of information that could tell us this?
- What are the few pieces of information (key indicators) that will tell us this?

Establishing good indicators will reduce the amount of information that needs to be collected. The Independent Advisory Committee on Socio-economic Analysis will assist Committees in this task by facilitating the preparation of a generic list of indicators which can be modified by Committees and/or consultants in the development of a monitoring plan. This list will be developed through consultation with Committees and in light of experience with the assessment process.

#### Identify information sources and method of collection

Once indicators have been established for each monitoring question, Committees and/or experts will need to decide where the information can best be obtained and the information gathering tools which can best facilitate the gathering of such information. Some information may be available from secondary sources (such as ABS Census) while other information will have to be collected from primary sources. Remember that one tool can gather information that answers many monitoring questions.

Using the example above, the sources of information and the information gathering tools which can best facilitate the gathering of the information are outlined in Table 5:

Further advice on information sources and data gathering tools will be provided by the Independent Advisory Committee as required.

Table 5: An example of monitoring questions, indicators, potential sources of data and methods of collection

Monitoring Questions	Indicators	Sub-indicators	Source of data/ Method of collection
1. Will changes in water management regimes affect employment levels in the region?	<ul style="list-style-type: none"> <li>• Level of employment</li> </ul>	<ul style="list-style-type: none"> <li>• Number of adults employed (full-time, part-time and casual)</li> </ul>	<ul style="list-style-type: none"> <li>• Review of secondary data such as ABS, IDR statistics</li> </ul>
2. Will changes in water management regimes affect community cohesion?	<ul style="list-style-type: none"> <li>• Kinship and friendship ties</li> <li>• Interaction with neighbours</li> <li>• Resident involvement in community groups</li> <li>• Resident reliance on local services</li> <li>• Satisfaction of place</li> </ul>	<ul style="list-style-type: none"> <li>• Number of closest friends in community</li> <li>• Number of relatives in community</li> <li>• Number of visits to neighbours</li> <li>• Number of times help or receive help from neighbours</li> <li>• Membership in community groups</li> <li>• Extent of reliance on local services (ie groceries, petrol, banking, doctor)</li> <li>• Level of satisfaction with place</li> </ul>	<ul style="list-style-type: none"> <li>• Primary data obtained through survey methods, qualitative assessment through informal interviewing, focus groups, and community workshops</li> </ul>

### On-going processes for consultation

It is important to establish how often monitoring will need to occur and what on-going processes will need to be established to ensure that this activity is continued. At this stage it is also important to decide who will do the monitoring and what role Government agencies, Committee members and stakeholders will have in the monitoring, reviewing and reporting of information to community and Government.

An on-going process for consultation is particularly important in monitoring of community change as this is often difficult to assess through the use of static indicators. It might be more productive to take an intelligence gathering approach to monitoring community change which would involve, for example:

- the establishment of monitoring committees involving local residents who meet regularly to share their knowledge of the community's social system and their views of how it appears to be changing;
- reliance on the monitoring committee's ability to sense 'significant' changes, especially of a qualitative nature; and
- subjecting the monitoring Committee's assessments to peer review.

This process of monitoring community change should be incorporated into any monitoring strategy devised by the committees to ensure that the community's perceptions on how it is adapting and coping with the change is not overlooked.

### Evaluation and Adjustment

Committees will need to evaluate the implementation of new water management regimes in terms of:

- progress in meeting its agreed objectives and its goals;
- community's satisfaction with the implementation of new water management regimes; and
- the monitoring process itself.

The monitoring process itself may be evaluated in terms of:

- the level of resources required (for collection, collation, analysis and dissemination) to undertake monitoring;
- the degree of difficulty of applying the method;
- the reliability of information collected; and
- the relevance of information for decision-making processes (and for different audiences).

Following evaluating the monitoring process itself and the results arising from that process, Committees will be in an informed position to put recommendations to Government in terms of:

- any new monitoring programs or adjustments to existing monitoring that may be needed;
- changes to the Plan, interim plans or actions proposed which better meet agreed objectives and community's and Government's satisfaction with the implementation of them;
- more effective use of resources to obtain a certain effect, or a better distribution of resources to get a better effect; and
- more effective mitigation measures and recommendations to refute or support compensation claims.

Monitoring and evaluation are not only feedback mechanisms in the development of the Plan and in its revision, they will also inform the development of a monitoring strategy which will ensure that once the Plan is signed-off continued monitoring of its performance will occur.

For further information on developing a monitoring strategy refer to the *Writing a Plan* section in the *Support Package*.

## Attachment 1

### A Community Water Profile Pro-forma

#### Step 1 of the Socio-economic Assessment Guidelines for Land and Water Management

The focus of the community water profile is to assemble key socio-economic data which will enable Committees to obtain a general picture of their catchment in terms of its socio-demographic and economic structures. This exercise also aims to provide Committees with information on the types of water use in the catchment and a brief profile of the water users.

Details on the assembly of information relating the bio-physical elements of the catchment is found in the *Process in Making a Plan* section of the *Support Package for River, Groundwater and Water Management Committees* and are therefore not discussed in this attachment.

One of the first tasks in preparing a community water profile is to identify and assemble existing information. The inter-agency working group will assist Committees with this task. This will provide the basis for assessing the type and scope of information that may need to still be compiled or collected.

Where information has already been well documented in an earlier plan, such as a Catchment Management Strategy, this section could simply refer to that document and only attempt to fill in important gaps in information.

The following is a pro-forma of the types of information which could be collected at this initial stage of the socio-economic assessment framework. This is the first step in understanding your catchment and the use of water in it. Information assembled here will be built on over time and will provide the basis for future monitoring activities.

## 1. Catchment Profile

### 1.1. History

#### 1.1.1 Aboriginal History

Briefly describe the Aboriginal community areas within the catchment and any significant events in the region, focusing on issues relating to use of water and beliefs. Sources of information include NSW Aboriginal Land Councils and local historical societies.

#### 1.1.2 European History

Briefly describe the major events in European history of this region, focusing on those relating to the use of water. Information on the history of European settlement and activities may be drawn from previous regional studies, historical societies and through facilitated workshops with Committee members. It is useful to display this information in a table format such as the example displayed below.

**Table 1: An example table of major events in the European history of the Aqua Catchment**

Year	Event	Impact on Region
1840s	Exploration, occupation and settlement of area	Established pastoralism with major cattle stations established. Towns such as Cattle town, Small town and Hopetown were established.
1861	Crown Lands Acts were passed	The passage of Crown Lands Acts opened up Crown Land (previously pastoral leases) to farmers resulting in broad scale land clearing. Overclearing, rabbit plagues and overgrazing resulted in severe soil erosion on steep terrain in the Highland Ranges.
1880s	Expansion of agriculture industry	Significant growth in the area's population and expansion in agriculture. Rail and road construction link region with coast. Increased demand for timber leads to a number of mills being established in the upper part of the catchment.
1890s to 1900	Economic depression and drought	Record drought causes widespread devastation to agriculture sector. The timber industry continued to develop to provide materials for public utilities construction.
1920s	Dam construction	First dam at Sheoak was constructed to prevent periodic flooding of the Aqua River and for irrigation. Irrigation industry established in lower part of catchment.
1930s	Depression	Similar impacts to 1890s depression. Population decline.
1940s	War, boom in wool and manufacturing	Textile industries were established during WWII in Woottown and Hopetown. Irrigated agriculture continues to expand. Boom in manufacturing and expansion in irrigated agriculture results in significant population growth, particularly in Woottown and Hopetown.
1950-60s	Infrastructure and tourism development	Improvements to various town's amenities and Lake Sheoak Dam expanded. Increased growth in irrigated agriculture. Diesel replaced steam engines increasing railway freight and level of manufacturing industries in area. Tourism develops around Lake Sheoak.
1970s	Floods, highway bypass	Early 1970s saw the flooding of Sheoak and Woottown. Many towns were bypassed by Highway 1 in the late 1970s which, in addition to economic change, led to their decline.
1980s onwards	Economic recession, increase in tourism, environmental degradation	Drought and low commodity prices resulted in severe economic downturn in early 1980s. Major employer in most towns was the public sector as many processing and textile industries had closed. Blue-green algae outbreak in Aqua River and salinity problem worsening. Continued growth in tourism.

## 1.2 Social Demography

A socio-demographic profile of the catchment will provide Committees with a better understanding of the structure of the catchment's population as a whole and by sub-regions (ie. local government areas).

At this stage of the assessment process, the focus should be on assembling existing data from previous reports or from Australian Bureau of Statistics (ABS) Census of Population and Housing and ABS Integrated Regional Databases statistics (source DLWC). The inter-agency working group can assist you in collating this type of information.

Catchment boundaries may not align exactly with census collection units and some discrepancies may occur. However, for the purpose of informing the generation of options for new water management regimes a high degree of accuracy of data on socio-demographic statistics for the catchment is not essential.

Important statistics on the catchment which should be assembled are:

- total population of catchment;
- population levels for different sub-regions;
- population change - have the catchment and local government areas (LGAs) within it experienced population decline or growth;
- age structure of population in catchment - in particular, it is useful to know the percentage of population less than 15 years of age and older than 65 years;
- average annual household income in catchment and in particular LGAs if highly variable. It is also useful to compare this figure with a regional average to see how the catchment compares with regional NSW; and
- education levels - percentage of tertiary qualified people in comparison to regional NSW.

## 1.3. The Labour Force

The purpose of this section is firstly, to provide information on employment levels for the catchment (as a whole and by sub-region) and secondly, to profile the major industries in the catchment.

### 1.3.1 Employment and Unemployment

It is important for Committees to have an understanding of the trends in employment and unemployment levels in the catchment over time. This information may be drawn from ABS Census of Population and Housing. The inter-agency working group can assist Committees in the collation of this information. Regional Development Boards and local government may also have information on employment trends in the region.

### 1.3.2 Employment by Industry

Statistics on employment levels by industry sector show the structure of an economy at a particular point in time. Examining these employment profiles over two or more

time periods highlights the changes which have been occurring with regard to employment. This can be easily done by drawing data over a number of ABS Census of Population and Housing periods (say 1995, 1991, 1986). The inter-agency working group has access to ABS databases and can assist Committees in completing this task.

Industry sector data may also be aggregated into primary (agriculture, forestry, fishing and mining based industries), secondary (manufacturing and processing industries) and tertiary sectors (service sectors such as construction, wholesale and retail trade, communications and finance) to provide an indication of structural changes which may be occurring in the region. The importance of the different industry sectors should be taken into account in defining future water use management options.

## 1.4 Industry Profile by Local Government Area

Within catchments there is often great variability in the nature of the industry sectors which are important. At this stage it is useful to provide a brief profile of the major industries for each of the main areas in the catchment. A brief profile may include:

- list of industry sectors which are main employers (ABS Stats);
- major recent industry developments in catchment;
- gross turnover of the major industries;
- expenditure of major industries (if known);
- trends in emerging industries (ie increased viticulture and/or tourism);
- brief comments on economic strengths and weaknesses of area (ie. proximity to major centres, transport infrastructure); and
- visions for the future (if already developed by local government etc.).

Local government and Regional Development Boards are often good sources of this type of information.

Committees may wish to access more detailed information on particular industry sectors, such as agriculture, and develop an employee profile. Such information which may be useful to assemble from ABS statistics includes:

- age and gender of employees;
- education levels of employees; and
- income of employees.

## 1.5 Community Infrastructure

Briefly outline the number and type of health and education services (governmental and non-governmental) which exist in the catchment by Shires. This information is often contained in community service directories or held by local government.

Comments on whether the level of community services has increased, decreased or have been stable over time

(say 10 years) is useful to obtain through focused discussions with Committee members and with local government and Regional Development Boards. This information provides an indication of the health and vitality of a community.

## 2. Water Use Profile

A key criterion in a community water profile is a water use profile (active and passive). Collating this information will provide committees with an understanding of:

- How is water used (active and passive) in the catchment?;
- Where do these groups access the resource?;
- How much resource is accessed?;
- What do these groups use water for?; and
- What social and economic contributions do these users make to the local and wider community? For example, how many people do they employ? Expenditure in region and locality?

### 2.1 Water Resources

Where information has already been well documented on water resources in an earlier plan, such as the Regulated River Management Committee's response to the Government's interim river flow rules, this section could simply refer to that document.

To focus the assembly of information, the Committees may wish to consider the following questions:

- What is the volume of water available?;
- How reliable is the water flow?;
- What is the quality of water available (include temperature if relevant)?; and
- What are alternative sources of water (ie through re-use or better efficiency)?

This information could be assembled for different parts of the catchment and at different points in time. The spatial and temporal scale of data which is sought will depend on availability of data and information requirements of the Committees.

This information can be sourced from Department of Land and Water Conservation, Irrigation Authorities and from reports such as the Land and Water Management Plans, Activity Reports, local irrigation officers and agronomists.

### 2.2 Types of Water Use in Catchment

It is important at the beginning of this exercise to identify existing and potential water uses in the catchment, including passive uses of water. This list of water uses will provide the basis for identifying the effects of changes in water management regimes on different types of water use categories. At this stage, Committees may also wish to note any trends in the changes in water use over time.

The following is an example of the types of information Committees may wish to assemble on water use in the catchment. Most of the information pertaining to licensed water use is held by the Department of Land and Water Conservation.

#### 2.2.1 Extractive Water Use

Prior to assessing the socio-economic impacts of new water management regimes Committees must first establish the nature of water use in the catchment. The collation of information should focus on :

- What is water used for?;
- How much water is used by category of water use?;
- How many licensed users are there by category of water use?;
- Where is water accessed?; and
- When is water used?

Water use information is available from the Department of Land and Water Conservation for regulated, unregulated and groundwater licence holders. The level of and accuracy of information available varies for each type of licence holder. Sources of information on agriculture may be sought from NSW Agriculture and ABARE.

Where information is available, Committees should briefly describe water use in the catchment in terms of:

#### Regulated licences

- Number of licences
- Location of licensees
- Volume of water allocated in total
- Irrigated area by crop (if available)
- Estimated volume of water allocated by use category (cotton, pasture, viticulture etc.)

#### Unregulated licences

- Location of licensees
- Area irrigated
- Total farm water use
- Estimated volume of water allocated by use category

#### Groundwater licences

- Estimate number of bore licences and volume of water used
- Rough location of bore water users
- Estimated volume of water allocated by use category

Committees may wish to present key information in a table format like the example shown below. It may also be of benefit to roughly map the different uses of water, noting any conflicts in use.

Table 2: An example table of extractive water use in the catchment

Extractive water use categories	Number of users	Estimated volume of water used (sub-region x)	Estimated volume of water used (sub-region y)	Estimated volume of water used (sub-region z)	Estimated total volume of water used
Agriculture					
- Cotton					
- Grain					
- Lucerne					
- Grape vines					
- Fruit					
- etc					
Grazing					
Town water					
Bulk water businesses					
Manufacturing/ processing					
Power generation					
Mining					
Other industry					
etc					
etc					

### 2.2.2 Non-extractive Use

Not only will Committees need to identify different types of extractive water uses, they will also need to identify existing and potential non-extractive uses of water in the catchment. Information on the nature and location of water use for the following categories should also be compiled.

- Recreation and tourism
- Spiritual
- Aesthetic
- Ecological

Committees may wish to map out the location of water use, noting where the potential for conflict may arise. Consultation with groups who have an interest in non-extractive use should be undertaken to ensure that a comprehensive list of non-extractive uses are identified.

At this stage is likely that Committee members will begin to identify key issues for representative groups of people

who are interested in certain types of water use.

The analysis of stakeholder issues is discussed more fully in the following section.

### 2.3 Water Use Perspectives

Once Committees have identified major water use within the catchment, Committees will need to identify major water user groups and obtain statements of water use perspectives for each group. These statements will reflect the perspectives of each group with respect to the existing or potential water uses (and associated land uses) within the catchment. This type of analysis is referred to as “strategic perspectives analysis”<sup>1</sup>. These perspective statements should incorporate information about:

- each group’s understanding of their preferred vision for water use and management in the catchment;
- each group’s understanding of why this vision is important (ie its objectives regarding preferred water use management);

- constraints and opportunities that each group feels they will experience in pursuit of their objectives; and
- strategies developed or proposed by each group to achieve their objectives.

Key stakeholder groups' perspectives should be sought firstly from community representatives on the committees and then, if necessary, through consultation with other groups in the catchment whose views are not adequately represented on the committee.

<sup>1</sup> Dale, A. & Lane, M. (1994) Strategic Perspectives Analysis: A Procedure for Participatory and Political Social Impact Assessment, *Society and Natural Resources* 7(3):253-267.

## 2.4 Profile of Water Users

Committees may wish to assemble further information on the water users in the catchment. The collation of the information on water users should focus on:

- How many primary users are there (per user groups) and where are they located?;
- What financial benefit is derived from water allocation?;
- How many people do they employ?; and
- What is their expenditure in the locality, in the region? Where do they spend their money?

For the different user groups Committees may wish to collate the following types of information. If information is not readily available, the Committee should assess the type and scope of information that may need to be compiled or collected as part of the assessment process. Lack of detailed information should not, however, prevent Committees from moving onto the next step in the Guidelines.

The type of information Committees may wish to compile for different user groups may include:

### 2.4.1 Extractive Users Agriculture

- Number of farm businesses total and by type
- Total value of agriculture sector, value and production of major crop types
- GVP of irrigated agriculture
- Total area of irrigated agriculture holdings
- Area irrigated as percentage of total holding
- Total employment in agriculture and employment in irrigated agriculture
- Linkages to communities (if known)
  - location of farms and residence of employees
  - location and value of major purchased farm inputs
  - where are farm outputs handled/processed; and
  - location of purchased farm household related goods and services, including public sector services such as education, health and recreation.

### Other extractive users

- Total number of users by type of user (ie towns, mining sector, electricity)
- Total value of business/industry sector (if appropriate)
- Total employment reliant on water use
- Linkages to communities (if known)
  - location of business and residence of employees
  - location and value of major purchased inputs
  - where are outputs handled/processed; and
  - location of purchased goods and services, including public sector services such as education, health and recreation.

### 2.4.2 Non-extractive Users

- Location of non-extractive use areas by type of use
- Number and location of businesses reliant on non-extractive water use by type (ie. fishing, tourism, water sports)
- Total value of businesses reliant on non-extractive water use (if known)
- Assessed value of environmental or non-use values (if known)
- Linkages to communities (if known)
  - Location of business and/or residence of non-extractive users
  - Location and value of major purchased inputs for businesses reliant on non-extractive water use
  - Location of purchased goods and services, including public sector services such as education, health and recreation.

The assembly of this type of information provides Committees with a good understanding of their catchment from which to generate management options. The community water profile provides a basis for assessing the socio-economic impacts of options generated. It is the first step in the process and forms the foundation for the other steps.