ORGANISATIONS AND CHANGE

A COMPARATIVE ANALYSIS OF
SEVEN AUSTRALIAN WATER AUTHORITIES

M.A.(Administration) Thesis

by

A.I. Lawrence

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Canberra College of Advanced Education
# TABLE OF CONTENTS

## 1. INTRODUCTION

<table>
<thead>
<tr>
<th>Subsection</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.1 Purpose of the thesis</td>
<td>1</td>
</tr>
<tr>
<td>1.2 Sources of theory</td>
<td>5</td>
</tr>
<tr>
<td>1.3 Research method</td>
<td>8</td>
</tr>
<tr>
<td>1.4 Elaboration of the legitimation model</td>
<td>10</td>
</tr>
<tr>
<td>1.5 Periods of analysis</td>
<td>10</td>
</tr>
<tr>
<td>1.6 References</td>
<td>13</td>
</tr>
</tbody>
</table>

## 2. FORMATIVE FACTORS

<table>
<thead>
<tr>
<th>Subsection</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.1 Introduction</td>
<td>14</td>
</tr>
<tr>
<td>2.2 Background to the authorities</td>
<td>14</td>
</tr>
<tr>
<td>2.3 Issues underlying the establishment of the authorities</td>
<td>19</td>
</tr>
<tr>
<td>2.3.1 Social &amp; economic deprivation within the urban areas</td>
<td>19</td>
</tr>
<tr>
<td>2.3.2 Scarcity of productive land</td>
<td>22</td>
</tr>
<tr>
<td>2.3.3 Economic deprivation of rural communities</td>
<td>24</td>
</tr>
<tr>
<td>2.4 Issues underlying the establishment of the authorities which required successful attainment of particular goals</td>
<td>27</td>
</tr>
<tr>
<td>2.4.1 Removal of responsibility for the provision of services from local government</td>
<td>27</td>
</tr>
<tr>
<td>2.4.2 Relegation of powers by parliament</td>
<td>29</td>
</tr>
<tr>
<td>2.5 Local values, perspectives and ideologies</td>
<td>31</td>
</tr>
<tr>
<td>2.5.1 Political ideology and interest groups</td>
<td>31</td>
</tr>
<tr>
<td>2.5.2 Hostility to authority</td>
<td>33</td>
</tr>
<tr>
<td>2.5.3 Inter-colonial rivalry, rural conservatism, and the urban-rural dichotomy</td>
<td>35</td>
</tr>
<tr>
<td>2.5.4 The role of government</td>
<td>37</td>
</tr>
<tr>
<td>(a) Derivative sources</td>
<td></td>
</tr>
<tr>
<td>(b) Local adaptations</td>
<td></td>
</tr>
<tr>
<td>(c) Summary</td>
<td></td>
</tr>
<tr>
<td>2.5.5 Economic perspectives and strategies</td>
<td>40</td>
</tr>
<tr>
<td>2.5.6 Legal and administrative jurisdiction of public authorities</td>
<td>43</td>
</tr>
<tr>
<td>(a) Derivative sources</td>
<td></td>
</tr>
<tr>
<td>(b) Local adaptations</td>
<td></td>
</tr>
<tr>
<td>2.5.7 Administrative practice</td>
<td>45</td>
</tr>
<tr>
<td>2.6 Implications for the legitimation hypothesis</td>
<td>47</td>
</tr>
<tr>
<td>2.7 References</td>
<td>51</td>
</tr>
</tbody>
</table>
### 3. ORGANISATION INPUTS

<table>
<thead>
<tr>
<th>Section</th>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.1</td>
<td>Introduction</td>
<td>54</td>
</tr>
<tr>
<td>3.2</td>
<td>External support factors</td>
<td>54</td>
</tr>
<tr>
<td>3.2.1</td>
<td>Political support</td>
<td>54</td>
</tr>
<tr>
<td>(a)</td>
<td>Theoretical framework</td>
<td></td>
</tr>
<tr>
<td>(b)</td>
<td>The provision of services as a means of alleviating urban and rural deprivation and of providing a minimum standard of living</td>
<td></td>
</tr>
<tr>
<td>(c)</td>
<td>The promotion of closer settlement as a means of engendering rural growth and prosperity</td>
<td></td>
</tr>
<tr>
<td>(d)</td>
<td>The provision of infrastructure as a means of promoting economic growth and national development</td>
<td></td>
</tr>
<tr>
<td>(e)</td>
<td>The provision of irrigation and rural water supply in response to the rural electorate and interest groups</td>
<td></td>
</tr>
<tr>
<td>(f)</td>
<td>Visibility of works and services</td>
<td></td>
</tr>
<tr>
<td>(g)</td>
<td>Compliance of organisations as arms of government with expected standards of behaviour and performance</td>
<td></td>
</tr>
<tr>
<td>(h)</td>
<td>Summary</td>
<td>68</td>
</tr>
<tr>
<td>3.2.2</td>
<td>Client support</td>
<td></td>
</tr>
<tr>
<td>(a)</td>
<td>Theoretical framework</td>
<td></td>
</tr>
<tr>
<td>(b)</td>
<td>Analysis of authorities</td>
<td></td>
</tr>
<tr>
<td>(c)</td>
<td>Summary</td>
<td></td>
</tr>
<tr>
<td>3.2.3</td>
<td>Professional support</td>
<td>72</td>
</tr>
<tr>
<td>(a)</td>
<td>Theoretical framework</td>
<td></td>
</tr>
<tr>
<td>(b)</td>
<td>Analysis of authorities</td>
<td></td>
</tr>
<tr>
<td>(c)</td>
<td>Summary</td>
<td></td>
</tr>
<tr>
<td>3.3</td>
<td>External sources of legitimation</td>
<td>75</td>
</tr>
<tr>
<td>3.3.1</td>
<td>The role of government</td>
<td>75</td>
</tr>
<tr>
<td>(a)</td>
<td>Theoretical framework</td>
<td></td>
</tr>
<tr>
<td>(b)</td>
<td>Analysis of authorities</td>
<td></td>
</tr>
<tr>
<td>(c)</td>
<td>Summary</td>
<td></td>
</tr>
<tr>
<td>3.3.2</td>
<td>Administration practice</td>
<td>79</td>
</tr>
<tr>
<td>(a)</td>
<td>Theoretical framework</td>
<td></td>
</tr>
<tr>
<td>(b)</td>
<td>Analysis of authorities</td>
<td></td>
</tr>
<tr>
<td>(c)</td>
<td>Summary</td>
<td></td>
</tr>
<tr>
<td>3.4</td>
<td>Availability of resources</td>
<td>82</td>
</tr>
<tr>
<td>3.4.1</td>
<td>Physical resources</td>
<td>82</td>
</tr>
<tr>
<td>(a)</td>
<td>Resource outline</td>
<td></td>
</tr>
<tr>
<td>(b)</td>
<td>Authority analysis</td>
<td></td>
</tr>
<tr>
<td>3.4.2</td>
<td>Legal and administrative jurisdiction</td>
<td>88</td>
</tr>
<tr>
<td>3.4.3</td>
<td>Financial resources</td>
<td>92</td>
</tr>
<tr>
<td>3.4.4</td>
<td>Available technology</td>
<td>94</td>
</tr>
<tr>
<td>3.4.5</td>
<td>Human resources</td>
<td>96</td>
</tr>
<tr>
<td>3.5</td>
<td>Summary</td>
<td>97</td>
</tr>
<tr>
<td>3.6</td>
<td>References</td>
<td>103</td>
</tr>
</tbody>
</table>
### 4. ORGANISATION OUTPUTS

<table>
<thead>
<tr>
<th>Subsection</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.1 Analytical framework</td>
<td>106</td>
</tr>
<tr>
<td>(a) Nature of services to be provided</td>
<td>106</td>
</tr>
<tr>
<td>(b) Principles of implementation of services</td>
<td>106</td>
</tr>
<tr>
<td>4.2 Nature of service outputs</td>
<td>107</td>
</tr>
<tr>
<td>4.2.1 Metropolitan water authorities</td>
<td>107</td>
</tr>
<tr>
<td>(a) Water supply</td>
<td>107</td>
</tr>
<tr>
<td>(b) Sewerage</td>
<td>107</td>
</tr>
<tr>
<td>(c) Metropolitan drainage &amp; flood control</td>
<td>107</td>
</tr>
<tr>
<td>4.2.2 Rural water authorities</td>
<td>116</td>
</tr>
<tr>
<td>(a) Irrigation &amp; drainage</td>
<td>116</td>
</tr>
<tr>
<td>(b) Domestic &amp; stock water supply</td>
<td>116</td>
</tr>
<tr>
<td>(c) Drainage &amp; flood control</td>
<td>116</td>
</tr>
<tr>
<td>(d) River improvement programmes</td>
<td>116</td>
</tr>
<tr>
<td>(e) Farm water supply</td>
<td>116</td>
</tr>
<tr>
<td>(f) Rural town water supply &amp; sewerage</td>
<td>116</td>
</tr>
<tr>
<td>4.3 Economic and financial management strategies</td>
<td>126</td>
</tr>
<tr>
<td>4.3.1 Analytical framework</td>
<td>126</td>
</tr>
<tr>
<td>4.3.2 Analysis of authorities</td>
<td>126</td>
</tr>
<tr>
<td>(a) Metropolitan water authorities</td>
<td>126</td>
</tr>
<tr>
<td>(b) Rural water authorities</td>
<td>126</td>
</tr>
<tr>
<td>4.4 Input-output associations</td>
<td>130</td>
</tr>
<tr>
<td>4.4.1 Introduction</td>
<td>130</td>
</tr>
<tr>
<td>(a) Policy area categories</td>
<td>130</td>
</tr>
<tr>
<td>(b) Implementation strategy categories</td>
<td>130</td>
</tr>
<tr>
<td>(c) Implementation technique categories</td>
<td>130</td>
</tr>
<tr>
<td>4.4.2 Summary of input-output associations</td>
<td>131</td>
</tr>
<tr>
<td>(a) Metropolitan water authorities</td>
<td>131</td>
</tr>
<tr>
<td>(b) Rural water authorities</td>
<td>131</td>
</tr>
<tr>
<td>4.5 References</td>
<td>144</td>
</tr>
</tbody>
</table>

### 5. INTERNAL PROCESSES AND EXPLANATORY ANALYSIS

<table>
<thead>
<tr>
<th>Subsection</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>5.1 Introduction</td>
<td>145</td>
</tr>
<tr>
<td>5.2 Perceived primary tasks</td>
<td>145</td>
</tr>
<tr>
<td>5.3 Differentiation of tasks &amp; control of organisations</td>
<td>148</td>
</tr>
<tr>
<td>5.3.1 Introduction</td>
<td>148</td>
</tr>
<tr>
<td>5.3.2 Executive authority mode</td>
<td>151</td>
</tr>
<tr>
<td>(a) Theoretical framework</td>
<td>151</td>
</tr>
<tr>
<td>(b) Analysis of authorities</td>
<td>151</td>
</tr>
<tr>
<td>5.3.3 Bureaucratic mode</td>
<td>153</td>
</tr>
<tr>
<td>(a) Theoretical framework</td>
<td>153</td>
</tr>
<tr>
<td>(b) Analysis of authorities</td>
<td>153</td>
</tr>
<tr>
<td>5.3.4 Professional mode</td>
<td>158</td>
</tr>
<tr>
<td>(a) Theoretical framework</td>
<td>158</td>
</tr>
<tr>
<td>(b) Analysis of authorities</td>
<td>158</td>
</tr>
</tbody>
</table>
5.3.5 Technological mode
   (a) Theoretical framework
   (b) Analysis of authorities

5.4 Internal sources of legitimation
   5.4.1 Introduction
   5.4.2 Technical sources of legitimation
      (a) Theoretical framework
      (b) Analysis of authorities
   5.4.3 Normative sources of legitimation
      (a) Theoretical framework
      (b) Analysis of authorities

5.5 Negotiation of legitimation claims
   (a) Theoretical framework
   (b) Analysis of authorities

5.6 Legitimation model

5.7 Explanatory analysis
   5.7.1 Introduction
   5.7.2 Dominant groups
      (a) Input-output association
      (b) Explanatory analysis
   5.7.3 Pervasiveness of development perspectives
      (a) Input-output association
      (b) Explanatory analysis
   5.7.4 Entrenched nature of implementation techniques
      (a) Input-output association
      (b) Explanatory analysis
   5.7.5 Reactive basis of project commitment
      (a) Input-output association
      (b) Explanatory analysis
   5.7.6 Professionally determined standards
      (a) Input-output association
      (b) Explanatory analysis
   5.7.7 Limited corporate role
      (a) Input-output association
      (b) Explanatory analysis
   5.7.8 Financial management perspectives
      (a) Input-output association
      (b) Explanatory analysis
   5.7.9 Adoption of technology
      (a) Input-output association
      (b) Explanatory analysis

5.8 Findings and conclusions

5.9 References
6. IMPLICATIONS FOR THE FUTURE MANAGEMENT OF ORGANISATIONS

6.1 Need for change
6.2 Implications of the legitimation model for management
6.3 References
<table>
<thead>
<tr>
<th>FIGURE</th>
<th>DESCRIPTION</th>
<th>PAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.1</td>
<td>Input-output model</td>
<td>3</td>
</tr>
<tr>
<td>1.2</td>
<td>Legitimation model: First cut</td>
<td>11</td>
</tr>
<tr>
<td>2.1</td>
<td>Devolution of urban water authorities</td>
<td>18</td>
</tr>
<tr>
<td>2.2</td>
<td>Devolution of rural water authorities</td>
<td>18</td>
</tr>
<tr>
<td>2.3</td>
<td>Metropolitan population growth</td>
<td>20</td>
</tr>
<tr>
<td>2.4</td>
<td>Infant mortality rates</td>
<td>20</td>
</tr>
<tr>
<td>2.5</td>
<td>Settlement (land occupation) as a percentage of viable agricultural land</td>
<td>23</td>
</tr>
<tr>
<td>2.6</td>
<td>Exploitation of natural resources model</td>
<td>41</td>
</tr>
<tr>
<td>3.1</td>
<td>Metropolitan provision of water supply</td>
<td>56</td>
</tr>
<tr>
<td>3.2</td>
<td>Metropolitan provision of sewerage</td>
<td>56</td>
</tr>
<tr>
<td>3.3</td>
<td>Rural population growth</td>
<td>59</td>
</tr>
<tr>
<td>3.4</td>
<td>Value &amp; composition of annual production</td>
<td>59</td>
</tr>
<tr>
<td>3.5</td>
<td>Typical organisation structure of Commissions and Boards</td>
<td>81</td>
</tr>
<tr>
<td>3.6</td>
<td>Level of utilisation of available resources: Metropolitan water authorities</td>
<td>86</td>
</tr>
<tr>
<td>3.7</td>
<td>Level of utilisation of available resources: Rural water authorities</td>
<td>87</td>
</tr>
<tr>
<td>4.1</td>
<td>Correlation of dam construction with incidence of drought</td>
<td>109</td>
</tr>
<tr>
<td>4.2</td>
<td>Development of water storages</td>
<td>111</td>
</tr>
<tr>
<td>4.3</td>
<td>Provision of water supply storages</td>
<td>113</td>
</tr>
<tr>
<td>4.4</td>
<td>Water consumption</td>
<td>113</td>
</tr>
<tr>
<td>4.5</td>
<td>Development of irrigation areas: Intensive</td>
<td>117</td>
</tr>
<tr>
<td>4.6</td>
<td>Development of irrigation areas: Extensive</td>
<td>118</td>
</tr>
<tr>
<td>4.7</td>
<td>Number of diversion licenses</td>
<td>119</td>
</tr>
<tr>
<td>4.8</td>
<td>Reservoir storage per hectare of irrigation</td>
<td>121</td>
</tr>
<tr>
<td>4.9</td>
<td>Number of bore licenses</td>
<td>123</td>
</tr>
<tr>
<td>4.10</td>
<td>Rural town water supplies</td>
<td>125</td>
</tr>
<tr>
<td>4.11</td>
<td>Financial management of water authorities</td>
<td>127</td>
</tr>
<tr>
<td>5.1</td>
<td>(a) Typical organisation structure of metropolitan water authorities: Expansion period</td>
<td>149</td>
</tr>
<tr>
<td></td>
<td>(b) Typical organisation structure of rural water authorities: Expansion period</td>
<td>149</td>
</tr>
<tr>
<td>5.2</td>
<td>Organisation structure of EWSD: Re-politicisation period</td>
<td>150</td>
</tr>
<tr>
<td>5.3</td>
<td>Size of organisations: Metropolitan water authorities</td>
<td>157</td>
</tr>
<tr>
<td>5.4</td>
<td>Size of organisations: Rural water authorities</td>
<td>157</td>
</tr>
<tr>
<td>5.5</td>
<td>Decision making strategies</td>
<td>171</td>
</tr>
<tr>
<td>5.6</td>
<td>Legitimation model: Second cut</td>
<td>172</td>
</tr>
<tr>
<td>5.7</td>
<td>Legitimation model: Negotiation of priorities sub-model</td>
<td>173</td>
</tr>
</tbody>
</table>
ACKNOWLEDGEMENTS

This thesis is the culmination of a personal journey. It commenced some 14 years ago with my experience of frustration as a result of inexplicable corporate decisions and entrenched organisational attitudes. My journey involved many hours of discussion and debate with colleagues who had experienced similar difficulties. I decided in 1978 to develop a better personal understanding of the organisations and how they might respond in the future to a changing world.

To 'develop a better understanding', I undertook a course of studies covering political science, administration, management, economics and psychology; and embarked on research aimed at generating and testing a model of organisation processes that better equated with my personal experience of organisations.

Along the way, I have received considerable encouragement and assistance from colleagues, academics, and personnel within the organisations adopted as the basis of this thesis.

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LIST OF TABLES

2.1 Authority classification at the time of establishment
2.2 Summary of electoral representation: Ratio of city to rural electors per representative
2.3 Summary of implications of formative factors for the legitimation model:
   (a) Nature of the primary task
   (b) Criteria guiding implementation
   (c) Criteria guiding implementation
3.1 Ranking of the visibility of works
3.2 Membership of the Institution of Engineers Austr.
3.3 Periods of depressed streamflow effecting eastern Australia
3.4 Major floods
3.5 Classification of authorities
3.6 Statutory functions of authorities
3.7 Diversification of exports (% of total exports)
3.8 Loans approvals (values in $million)
3.9 Percentage self-financing
3.10 Summary of external inputs and their legitimation implications:
   (a) Nature of services required
   (b) Criteria guiding implementation
   (c) Criteria guiding implementation
   (d) Resources
4.1 Water resources planning & management strategies
4.2 Summary of outputs:
   (a) Metropolitan water authorities
   (b) Rural water authorities
5.1 Level of technology adopted within organisations
5.2 Numbers of sections within authorities
5.3 Summary of legitimation sources across groups:
   (a) Metropolitan water authorities
   (b) Metropolitan water authorities
   (c) Metropolitan water authorities
5.4 Summary of legitimation sources across groups:
   (a) Rural water authorities
   (b) Rural water authorities
   (c) Rural water authorities
Experience interviews were conducted within five of the seven authorities studied. The assistance provided by Messrs L. Bowen, G. Yeomans, P. French & R. Atherton of the Sydney Metropolitan Water, Sewerage & Drainage Board; Messrs B. Lloyd and N. Howard of the Melbourne & Metropolitan Board of Works, Mr I. Meacham of the State Rivers & Water Supply Commission, Mr P. Verdi of the Water Resources Commission of NSW, and Messrs J. Shepherd and A. Kinnear of the Engineering & Water Supply Department of SA, is gratefully acknowledged. I am also grateful to the librarians of the MMBW, SR&WSC and EWSD for assistance. The recollections of Messrs R. Badger and G. Henkel on their past experience in the WRC of NSW, Sydney MWS&DB, and SR&WSC were also useful.

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AUTHORSHIP

All of the research and development of material contained herein, including the compilation and drafting of Figures, is my own work. All sources of data and theory which have been drawn upon in this thesis have been acknowledged. The data used for the compilation of Figures, except where other sources are acknowledged, was drawn from Annual Reports, Year Books, Review of Australian Water Resources 1975, and the ANCOLD Bulletin on Large Dams.
1. INTRODUCTION.

1.1 Purpose of the thesis

During the mid to late 70s, there was growing public criticism of the failure of statutory authorities to respond to changing community needs. Wilenski, in the Report on the Review of New South Wales Government Administration noted that "statutory authorities continue to carry on meeting their original objectives, and (often) lack the breadth of vision to perceive change in community needs. There are institutional pressures for them to continue to do what they have (always) been doing."(1)

Notwithstanding their general 'lack of responsiveness to changing community needs', some organisations have exhibited significant adaptation in specific areas over time. The purpose of this thesis is therefore to explore the factors which facilitate or impede adaptation in policy outputs in response to changes in the organisation's operating environment.

The question is of vital concern to Australian water resource authorities, in view of the situation of full exploitation of available water resources which has been reached in many river basins, and the change in community aspirations from a primary focus on improved water supplies to a focus on a range of diverse needs.

Normative models of organisation and rational-deductive decision making concepts appear inappropriate descriptions of change processes in cases of competing vested interest groups characteristic of large and complex organisations. While the concepts of 'displacement of ends by means' and 'disjointed incrementalism' appear to accurately describe the outward appearance of administration, they contribute little to our understanding of the underlying adaptation processes.

From a personal background of employment in three water resource related authorities spanning a period of 25 years, and an involvement in the formulation of the National Water Policy (2) and Multi-Objective Planning (3) techniques in the 1970s, I have formed four major impressions of water resource organisations. Firstly, that there are two distinct spheres of organisational activity, as follows:

. the lower technical levels, within which activities may be characterised as normative-rational-deductive type processes. A large measure of consensus exists within the technical groups operating at this level;
. the upper administrative level, within which activities may be characterised more as political bargaining and posturing than as a rational-deductive
type process. There is a substantial amount of conflict and personal animosity apparent at this level.

Secondly, that while the overwhelming impression of organisational decision making is one of conflict between competing groups, there are some issues upon which there appears to be broad consensus across the organisation.

Thirdly, that the internal climate of attitudes and approaches to problems can be extremely rigid. An 'operator mentality', within which the imperatives of maintaining the existing technical systems are considered paramount, frequently prevails.

Finally, that officers are highly dedicated in their application of knowledge and skills in what they perceive as the broad community interest. This perspective together with that of 'professionalism' is perceived to place their activities 'above self interest'.

It appeared that conditions which threatened the survival of the organisation were required before a climate of acceptance of such concepts as 'Multi-Objective Planning' could prevail. For example, a crisis situation (water shortage in 1978) was required in the Perth metropolitan water supply before a shift in the corporate management and service strategies of the Perth Metropolitan Water Board could be implemented. On the other hand, there appear to have been significant shifts in policy outputs in areas such as development strategies and construction techniques within a number of the organisations, free of any suggestion of a crisis situation.

The concepts of role taking and role making, modified by the concepts of the socio-technical system, appear to describe adequately the decision processes occurring within groups at the lower technical levels. However, it appeared that conflict models were more appropriate as a description of the upper level policy determination processes, and that the conflict model concepts of Dahrendorf and Habermas were particularly applicable.

Accordingly, for the purposes of this research, conflict theory has been adopted as the basis of the identification of adaptation mechanisms. Organisations may be considered as fields of interdependent groups, interacting with each other and their environment in order to arrive at some collective goal. Distinct sets of group activities, values and structures develop across the organisations as a result of differentiation of work tasks. This differentiation of work task and associated differentiation in perspectives and interests leads to conflict between groups as they compete for scarce organisation resources (personnel and funds). (Refer to Figure 1.1: Input-output model)
FIGURE 1.1 INPUT - OUTPUT MODEL

INPUTS

DELEGATED FUNCTIONAL ADMINISTRATIVE AND FINANCIAL JURISDICTION

DEMANDS FOR SERVICES

SUPPORT POLITICAL CLIENT

RESOURCES PHYSICAL FINANCIAL

TRANSLATION PROCESSES

DIFFERENTIATION OF TASKS

FUNCTIONAL GROUPS AND THEIR DELEGATED AREAS OF RESPONSIBILITY

ALLOCATION OF ORGANISATION RESOURCES ACROSS GROUPS

OUTPUTS

PROVISION OF SERVICES CHARGES REGULATIONS
It is hypothesised that the allocation of resources across the competing groups will be determined by the relative distribution of sources of legitimation available to the groups. Under these conditions, significant changes in the organisation's environment, and thereby changes in the pattern of legitimation distribution within the organisation, may be necessary before a change in organisation outputs can occur.

Legitimation was used by Habermas to describe the process whereby the administrative system draws on universal values, inter-subjectively recognised norms, and participation in policy formulation, as the basis for substantiating the 'rightness' or 'correctness' of the actions. (4)

Sources of legitimation applicable to water resource authorities include:

- legally prescribed activities, such as audits, environmental protection, etc;
- organisation outputs having a high visibility with respect to the organisation's prescribed function;
- the level of technology that is employed in undertaking a task;
- factors of time, uncertainty, remoteness, cost, and specialist knowledge associated with undertaking a task.

The social and professional norms that prevail within an organisation represent a further source of legitimation available to groups within the organisation. These institutionalised norms and attitudes may be a reflection of either the major imperatives which confronted the organisation at an earlier date, or the ideology of the dominant groups within the organisation.

It is recognised that a wide range of factors are implicated in the decision making processes of organisations, including the nature of the stakes and players, the available options, the allocation of resources, precedent, communication channels, individual ambition, dominant groups, and leadership. It is argued, however, that each of these factors is ultimately constrained in terms of the availability of technical and normative bases of legitimation. The legitimation model accommodates consideration of the dominant group ideology and the institutional implications of organisation structure, rules and procedures, and performance criteria.

If it can be shown that the 'legitimation model' provides a plausible explanation of the 'translation of inputs to outputs' process, then the model will constitute a useful framework for the examination of adaptation mechanisms within organisations.
1.2 Sources of theory

The Dahrendorf conflict model identifies organisations as comprised of imperatively co-ordinated groups, interacting with each other and their environment. The differentiation of work tasks leads to the development of different perspectives and interests across the organisation. This differentiation leads to conflict between groups as they compete for scarce organisation resources (personnel, funds). (5)

The Dahrendorf conflict model identifies two levels of conflict: group conflict in which there is antagonism between organised collectivities; and class conflict in which group conflict arises from the authority structure of an imperatively co-ordinated association. (6)

Dahrendorf ascribes to all collectivities a set of latent interests, which may only become manifest (conscious to the individuals) under situations of antagonism with other collectivities or with authority. (7)

In every imperatively coordinated association (8), the interests of the ruling group must be the values that constitute the ideology upon which the legitimacy of its rule is based, whereas the interests of the subjected group constitute a threat to this ideology and the social relations it covers, i.e. there is constant conflict over the preservation or change of the status quo. The conflict between groups leads to changes in the structure of their social relations, through changes in the dominance relations. Hence, Dahrendorf's legitimation focus is on authority relationships within imperatively co-ordinated associations, or class conflict. Drawing on Weber, Dahrendorf redefines authority as the exercise of power which has been socially sanctioned as legitimate.

Habermas offers three important concepts closely related to those of Dahrendorf. Firstly, the concept of legitimation crisis; secondly, his theory of systematically distorted communication; and thirdly, the nature of "constitutive interests" underlying all knowledge.

As noted earlier, the term legitimation was used by Habermas to describe the process whereby the administrative system draws on universal values, inter-subjectively recognised norms, and participation in policy formulation as the basis of substantiating the 'rightness' or 'correctness' of actions. (9) Outputs from the administrative system comprise the steering of the market system (as the means of regulating the economic cycle), and intervention in the system of allocation of surplus accumulated capital. In exchange, the administrative system requires an input of mass loyalty. The level of mass
loyalty sustained will be dependent on the perceived legitimacy of the administrative actions, and the rewards they offer to the community. A situation in which there is a failure to sustain the required level of support is termed a 'legitimation crisis'.

This concept identifies the level of legitimation available (either internally or externally) to competing groups as an important determinant influencing decision making.

Habermas notes that language finds meaning through communication - the inter-subjective understanding of meanings and expectations established through discourse. Effective communication in the case of competing knowledge claims involves a discourse between the vying parties, in which the validity claims of one or the other are vindicated. Successful attainment of a genuine consensus is dependent on the successful resolution of four types of validity claims: comprehensibility, scientific and technical validity of the propositional content, normative validity, and the sincerity of the interlocutors. Effective communication may be distorted through the anchoring of beliefs in ideology or legitimising world views, or through the knowledge constitutive interests of groups.

This proposition indicates the inherent difficulties involved in securing effective communication between groups which have different tasks and consequently different perspectives and systems of rationality. The Habermas 'effective communication model' provides a useful framework for considering the institutionalised patterns of domination and of communication distortion likely to apply between competing groups within the organisation.

Habermas notes that facts are constituted through particular structures of experience and action. Within the three categories of pursuit of knowledge (empirical, cultural, and critical), there are underlying constitutive interests. The empirical sciences grasp reality in terms of technical control over objectified processes. Empirical-analytical knowledge is thus predictive knowledge, whose exploitation is dependent on the ability to replicate the conditions under which the experimentally observed events were established.

In Towards a Rational Society, Habermas notes that technology transforms the perceptions of reality, from a world of inter-subjectively determined sets of values and self understanding, to a world of quantified regularities and of technical control over objectified processes. (11)

Cultural understanding, on the other hand, is achieved via the mechanism of language. Hence, the constitutive interest of communicative action is one of the preservation of the inter-subjectivity of mutual understanding.
Where conflict arises from relations of authority, the subjected group may challenge the basis of authority claims of the dominant group. The constituent interest of this type (Critical) of action is one of emancipation or freedom from institutionalised forces of domination or systematically distorted communication. Gouldner and Kuhn express similar views in terms of ideologically biased sociology as a result of the untested background or domain assumptions, and the concept of paradigms and paradigm shifts. (12, 13)

Habermas concludes that the application of all knowledge involves a constitutive interest. Orientation toward technical control, toward mutual understanding in the conduct of life, and toward emancipation from seemingly 'natural' constraints, establish the specific viewpoints from which we can apprehend reality. The three categories of interest take form in the medium of work, language, and power. (14)

The concept of knowledge constitutive interests has two implications for a 'legitimation' theory of organisation. Firstly, given the constitutive interest nature of knowledge, each group will evolve its own set of symbols and cognitive systems, leading to difficulties in communication across the organisation, and to the emergence of widely varying interpretations of problems across the organisation, viz: conflict between groups in the identification of appropriate solutions.

Secondly, within the technical-rational domain of action, problems and solutions will be perceived in terms of the 'technically useful knowledge' held by these groups, but the ability of groups to implement these solutions will depend on their ability to substantiate the application of the required techniques of control in the existing normative concepts of authority, or to seek to modify the existing normative concepts in the interest of the benefits offered by the particular solution.

Finally, Contingency Theory offers some useful 'legitimation' related insights into the level of routinisation which exists in an organisation.

Imperatively co-ordinated associations require the relegation of individual rights in the collective interest. This delegation of authority is legitimated by the benefits available through collective enterprise, and in terms of a commitment to the principle of rationality. Consequently, where tasks are repetitive, rules and procedures which provide for the efficient and co-ordinated application of tasks may be identified and accepted on the basis that they are technically valid and efficient.
The work of Burns & Stalker (15), and Lawrence & Lorsch (16) established that the level of uncertainty in information or the environment is an important determinant of organisation design and control systems. Woodward (17) and Perrow (18) established that technology introduces a range of uncertainty with respect to materials and technique which further impact on organisation design and control systems.

Clearly, in these cases, the application of rigid rules and procedures is technically inappropriate. Accordingly, a shift away from formalised hierarchical modes of co-ordination, to a professional and participatory mode of co-ordination is legitimated. Consequently, contingency represents an important source of legitimation which is available to some groups in the competition for organisation resources.

1.3 Research method

As a result of the differentiation of tasks across the organisation, the functional groups evolve different perspectives and compete for scarce organisational resources. It was hypothesised that relative claims to legitimisation represented the principal mechanism determining the allocation of organisational resources between the competing groups, and thereby the nature of organisational outputs.

It was further hypothesised that significant changes in the organisation's environment, and thereby shifts in the pattern of legitimisation distribution, may be required before a change in the pattern of organisation outputs can occur.

The model illustrated in Figure 1.1 may be considered as a 'black box', with inputs (demands for services, political and client support, funds, and climatic factors) and outputs (goods and services, charges, and regulations). The focus of the research is the nature of the 'translation of inputs to outputs' process, and whether the concept of 'legitimation' provides a plausible explanation of the nature of these processes. If the 'legitimation' concept is found to provide a plausible description of organisation decision making, then what does it tell us about the nature of adaptation processes?

In adopting an empirical approach to the research, a means of assessing changes in the operational environments of the organisations and in their pattern of output of goods and services was required. The research comprises:

- an analysis of the changes in the external environment and outputs of individual authorities over time;
- a comparative analysis of organisations in respect to the nature of demands placed upon them and the pattern
of goods and services produced by them;

the review of the above analysis in terms of those external factors which did and did not cause a change in policy outputs;

the use of the 'external factor-policy output' associations identified above to test the legitimation hypothesis.

By casting the analysis over a significant time span, the approach enabled the identification of formative enterprise factors which influenced organisation structures, control systems, and institutionalised values; and the identification of policy changes over time. The use of policy shifts over time and comparative analysis avoided the use of 'normative' judgements about the appropriateness of policy decisions relative to the organisation inputs at the time.

Data was derived from a range of sources, including Annual Reports, Project Reports, Reports of Royal Commissions and Committees of Enquiry, Year Books, official histories, theses, technical and administrative journals, and records held in organisation libraries. Experience interviews were conducted within 5 of the 7 organisations analysed to test the research findings and to obtain clarification of some issues.

Seven water resource authorities were selected for comparative analysis purposes. The selection was made with a view to providing a wide cross-section of public authority categories, and a range of physical, social, and political environments.

The organisations selected were:-
- Sydney Metropolitan Water, Sewerage & Drainage Board
- Melbourne & Metropolitan Board of Works
- State Rivers & Water Supply Commission of Victoria
- Water Resources Commission of NSW
- Queensland Water Resources Commission
- Engineering & Water Supply Department of SA
- Brisbane City Council
1.4 Elaboration of the legitimation model

The adoption of an empirical approach to the research requires the development of criteria for the assessment of changes in organisation outputs in response to changes in the organisation's operating environment, and for testing the adequacy of the hypothesis as an explanation of these changes. This Section elaborates the hypothesis in terms of its major components and their inter-relationships. It draws on theoretical sources external to the organisations examined in subsequent Chapters.

The hypothesis outlined in Section 1.1 develops the proposition that 'the allocation of resources across competing groups within organisations will be determined by the relative distribution of sources of legitimation available to the groups.' Sources of legitimation include the universal values, recognised norms, legally prescribed activities, and expectations of participation in the decision making process, which guide governments and public authorities in their policy formulation and administrative tasks.

Figure 1.2: 'Legitimation model: First cut' is based on theoretical material identified in Section 1.2 and illustrates the major components of the hypothesis and their inter-relationships. The legitimation model comprises three broad categories of factors, as follows:

- **External inputs:**
  - formative factors;
  - external support & legitimation components;
  - available resources;

- **Internal processes of resource allocation:**
  - perceived primary tasks;
  - differentiation of tasks;
  - internal sources of legitimation;
  - negotiation of legitimation claims;

- **Organisation outputs:**
  - resource allocation - policy outputs.

Each of these factors is elaborated in more detail in Chapters 2 to 5.

1.5 Periods of analysis

As noted in Section 1.3, the focus of this research is on the nature of the 'translation of inputs to outputs' process. Accordingly, it is necessary to identify the nature of changes in the social, political, economic, and physical factors impinging on each of the authorities over time. In developing the material for this thesis, it was
FIGURE 1.2 LEGITIMATION MODEL: FIRST CUT

- Formative Factors
- Available Resources
- External Support & Legitimation Components
- Perceived Primary Tasks Facing Organisation, & Underlying Assumptions & Strategies
- Differentiation of Tasks
- Functional Groups & Their Delegated Areas of Responsibility. Development of Group Perspectives & Knowledge Constitutive Interests
- Negotiation of Legitimation Claims
- Resource Allocation
- Organisation Outputs
- Organisation Values Perspectives, & Underlying Ideology
- Internal Sources of Legitimation
evident that as a means of simplifying the analysis, the social, political and economic factors could be grouped into three broad historic periods. The three periods are nominated as follows:

. the establishment period from the 1880s up until the Second World War, within which the major focus was on the initial establishment of services and the associated administrative machinery for their implementation;

. the expansion period following the Second World War up until 1969, during which primary focus was on the use of authorities by government to promote 'national development'; and

. the re-politicisation period from 1970 onwards, during which authorities underwent major review and re-structuring by governments in an attempt to make authorities more responsive to changing government priorities and community values and expectations.
1.6 References


2. The National Water Policy was an attempt to formulate a range of goals to guide governments in the ongoing development and management of water resources. It was initiated by the Department on the Environment in association with the Australian Water Resources Council, in 1973. An agreed document was finally adopted by the Commonwealth and State Governments in 1978.

3. The Multi-Objective Planning technique comprised the identification of broad social, economic, and environmental goals as the basis for generating and evaluating a range of water resource development and management options. Consequently, it introduced criteria and procedures which cut across the prevailing service strategies and the basis for their justification.

4. Habermas defines inter-subjectively recognised norms as the understanding of meanings and expectations which have been established through discourse. J. Habermas, Legitimation Crisis, Beacon Pr., 1971, p. 38


6. ibid p. 138

7. ibid pp. 167-8

8. Weber used the term 'imperatively co-ordinated association' in respect to differentiated organisations, as meaning 'the obligation incumbent upon the individuals and groups of the organisation to co-operate in order to realise the benefits of collective action'. R. Dahrendorf, op. cit., p. 167

9. J. Habermas, op. cit., p. 38

10. J. Habermas, op. cit., p. 46

11. J. Habermas, op. cit., pp. 54 & 85

12. A. W. Gouldner, The Coming Crisis of Western Sociology, Heinemann, 1971


14. J. Habermas, Knowledge and Human Interest, Beacon Press, 1971, pp. 308-311


17. J. Woodward, Industrial Organisation: Theory & Practice, Oxford Univ. Pr., 1965

2. FORMATIVE FACTORS

2.1 Introduction

The purpose of this Chapter is to examine the local social, political and administrative factors underlying the establishment of the seven water authorities, as a means of identifying the implications for the various components of the Legitimation Model.

The Chapter poses three questions:

1. What were the issues which led to the establishment of authorities having separate legal identity and delegated powers, and what were the implications of these issues for the primary goals and critical areas of performance for the authorities?

2. What were the assumptions regarding the nature of the problems that the authorities were established to resolve, and what were the strategies underlying the determination of authority functions and powers?

3. What were the political, economic and administrative ideologies, norms and values of the day relevant to the authorities, which subsequently became enshrined in the organisation ideology, perspectives and values?

2.2 Background to the authorities

As noted in Chapter 1, seven water resource authorities have been selected as the basis of this analysis. The authorities were selected with a view to providing a wide cross-section of public authority types, and a range of physical, social and political environments.

All of the authorities adopted had their genesis in the 1870s, 80s and 90s. This was a period of severe social deprivation in the urban areas as a result of unreliable and polluted water supplies and insanitary conditions. It was also a period of varying fortune in the rural areas, due to periodic droughts with associated heavy stock losses, and deprivation of the 'selectors' inexperienced in farming and allocated blocks of inadequate size and on marginal land.

The authorities selected comprise:

- Metropolitan water supply and sewerage Boards:
  - Sydney Metropolitan Water Sewerage & Drainage Board
  - Melbourne & Metropolitan Board of Works
Metropolitan water supply and sewerage Local Government
authority:
• Brisbane City Council

Rural water supply authorities:
• State Rivers & Water Supply Commission of Victoria
• Water Resources Commission of NSW
• Queensland Water Resources Commission

Combined metropolitan and rural water supply & sewerage
authority:
• Engineering & Water Supply Department of SA

The Sydney Metropolitan Water Sewerage & Drainage Board
(hereafter referred to as the Sydney Board) was established
in 1888 as the water supply and sewerage authority for the
County of Cumberland. Initially, it had responsibility for
the operation and administration of services only. The
functions of design and construction of works were vested
in the NSW Department of Works until 1940.

The Melbourne & Metropolitan Board of Works (hereafter
referred to as the Melbourne Board) was established in 1891
as the water supply and sewerage authority for the
Melbourne metropolitan area. Over the years, a number of
other functions have been added to the Board's
responsibilities, and the designated metropolitan area has
been greatly expanded.

The Brisbane City Council was established in 1924 with
responsibility for the planning and government of the city,
and for the provision of transport, roads and bridges,
water supply, sewerage and drainage services. The
responsibility for the design, construction, operation and
administration of water supply and sewerage services was
not transferred to the Brisbane City Council from the
Metropolitan Water Supply and Sewerage Board (established
in 1909 and hereafter referred to as the Brisbane Board)
until 1928.

The State Rivers & Water Supply Commission (hereafter
referred to as the SRWSC) was established in 1906, as the
authority responsible for rural water supply, and the
development, operation and administration of irrigation
Districts. The SRWSC was reconstituted as the Rural Water

The Water Resources Commission of NSW (hereafter referred
to as the WRC of NSW) was established by the Water
Resources Act of 1976. The Act re-constituted the Water
Conservation & Irrigation Commission (established in 1912
and hereafter referred to as the WCIC) as the authority
having state wide responsibility for the planning of water
resource development and utilisation; and for the operation
and administration of the irrigation, flood control Areas
The WCIC was originally vested with responsibility for the operation and administration of irrigation areas. The responsibility for the design and construction of works was vested in the NSW Public Works Department until 1940.

The Queensland Water Resources Commission (hereafter referred to as the Qld WRC) was established by the Water Resources Administration Act of 1978. The Act re-constituted the Queensland Irrigation & Water Supply Commission (established in 1946 and hereafter referred to as the Qld IWSC) as the authority responsibility for planning of water resource development and utilisation; and for the development, operation and administration of irrigation areas, stock and country town water supplies. The Qld IWSC was in turn re-constituted from the Office of the Commissioner of Irrigation and Water Supply, which was established in 1922.

The Engineering & Water Supply Department of South Australia (hereafter referred to as the EWSD) was established in 1929 as the authority responsible for water supply, sewerage and flood control for the Adelaide metropolitan area, rural town water supply and sewerage, and rural water supply. The EWSD was formed by the amalgamation of the Engineer-in-Chief and Hydraulic Engineer Departments. The Hydraulic Engineer Department was first created in 1878.

The categories of legal and administrative authority and the scope of the functions and services prescribed in the statutes establishing the organisations are summarised in Table 2.1.

Figures 2.1 & 2.2 summarise the devolution in administrative arrangements preceding the establishment of the authorities.
Table 2.1 Authority classification at the time of establishment

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Notes:
1. An integral part of the central executive government.
2. Listed as departments under the Public Service Act, but whose corporate bodies are given separate legal identity.
3. Vested with statutory powers but substantially free of direct political control. (Source: R.L.Wettenhall, A guide to Tasmanian Government Administration, Platypus Publ., 1968, pp.6-13)
4. The EWSD comprises a number of Ministerial Department type functions as well as a number of statutory (Departmental Corporation) type functions.
5. Initial controls were based on either authorities answerable to parliament via annual reports and the like (Victorian model), or answerable to parliament for the implementation of functions identified in enabling Acts, but independent of parliament in respect to the manner of their implementation (NSW model). (Source: J.Goldring & R.L.Wettenhall, 'Three perspectives on the responsibility of statutory authorities' in P.H.Weller & D.Jaensch, Responsible Government in Australia, Drummond Publ., 1980)
FIGURE 2.1 DEVOLUTION OF URBAN WATER AUTHORITIES

Colonial Administration
(1788 to 1840s)

Local Association or Local Government
(Melb 1842 to 53, Syd 1842 to 53 & 1857 to 88)
(Adel 1846 to 56, Brisb 1858 to 63 & 1928 on)

Water Supply Commissioners
(Melb 1853 to 60, Syd 1853 to 57, Adel 1856 to 58)

Public Works (or related) Departments
(Melb 1860 to 91, Adel 1856 on)

Public Corporations or Water Boards
(Brisb 1863 to 1928, Syd 1888 on, Melb 1891 on)

Local Government
Greater Brisbane City Cncl
(1928 on)


FIGURE 2.2 DEVOLUTION OF RURAL WATER AUTHORITIES

Lands or Public Works Departments
(Vic 1865 to 69, NSW 1890 to 1912)
(SA 1867 to 1888, Qld 1860 to 81)

Local Association or Local Government
(Vic 1869 to 86)

Water Supply Department
(Vic 1886 to 1906, SA 1888 on)

Office of Irrigation
(Qld 1922 to 46)

Departmental Corporation
(Vic 1906 on, NSW 1912 on, Qld 1946 on)

SA Vic., NSW, Qld.
2.3 Issues underlying the establishment of the authorities

What were the fundamental social and political issues which led to the establishment of the authorities; and what were the implications of these issues for the perceived primary tasks of the new organisations and for the strategies, values, and perspectives underlying the new organisations?

2.3.1 Social and economic deprivation within the urban areas

The colonies experienced strong growth within their centres of economic and political administration (Refer to Figure 2.3). This was a reflection of the role of the centres as the major trading centres servicing the hinterland, their command over the movement of produce into and out of the colonies, and the promotion of local manufacturing.

By the middle to late nineteenth century, the burgeoning urban communities had long since exceeded the capacity of local streams to cope with water supply and waste disposal demands. The communities suffered severe social deprivation as a result of the lack of reliable and pure water supplies, while the lack of waste collection and disposal services led to a high incidence of disease and mortality. (refer to Figure 2.4)

In the case of Sydney, serious problems had arisen by the 1860s as a result of unreliable water supply and insanitary conditions. A Royal Commission of Enquiry established by the government recommended (1869) that a major new water supply reservoir be constructed on the upper Nepean River. The construction of the reservoir was beyond the financial and technical resources of the local government authorities at the time.

Faced by a deteriorating health situation in the 1870s, the Sewerage and Health Board of Enquiry established by the government recommended in 1876 that the construction of a sewerage system be undertaken, including a large system of ocean outfall tunnels. Both the recommendations of the Royal Commission and the Health Board were supported by an eminent British Engineer appointed by the government to advise on the matter. (1)

In 1880, the government directed the Public Works Department to undertake the construction of the works, and enacted the Board of Water Supply & Sewerage Act 1880, establishing a Board to undertake the administration of the new works. (2)

In the case of Melbourne, the early source (Yarra River) of water supply became increasingly polluted as a result of the lack of sanitation and the discharge of industrial
FIGURE 2.3 METROPOLITAN POPULATION GROWTH

FIGURE 2.4 INFANT MORTALITY RATES
wastes to the river. The problem of ensuring a safe water quality was resolved by the establishment of the Commissioners of Sewers & Water Supply in 1853 to undertake the construction of a new source (Yan Yean Reservoir) of water supply. Hence, throughout the 1860s, 70s and 80s, Melbourne enjoyed a reliable and safe water supply.

By the 1880s however, the lack of sanitation gave rise to serious deterioration in social conditions. The sanitation crisis was a result of the land boom of the 1880s and of the inability of local government authorities to co-operate in the joint provision of sewerage systems. A Royal Commission on Sanitation recommended in 1889 an immediate commencement on a sewerage scheme and the establishment of a sewerage authority to undertake the works. The Royal Commission also recommended the appointment of a British sanitation engineer (James Mansergh) to commence the design of a scheme. Mansergh proposed the provision of a system comprising a large outfall sewer and a sewage farm at Werribee. The Melbourne & Metropolitan Board of Works Act 1890 established a new authority to construct and administer the works. Responsibility for the operation and administration of water supply was transferred to the new Board.

Adelaide suffered many years of unreliable water supply based on cartage from the Torrens River. Following the 1864 to 65 drought, a Parliamentary Select Committee Enquiry into Waterworks recommended (1867) the construction of a new large reservoir and the amalgamation of the Waterworks Department and the Engineer-in-Chief's Department to undertake the works. (3)

High levels of infant mortality occurred in the 1870s as a result of insanitary conditions. In 1878, the government enacted the Adelaide Sewers Act & Drainage Bill and established a separate Hydraulic Engineer Department to undertake the construction and administration of Adelaide's water supply and sewerage systems. (4)

Disease was rampant throughout the early history of Brisbane, with high (50%) infant mortality rates, and outbreaks of Plague, as a result of the totally inadequate provision of safe water supplies and sanitation systems. When the Brisbane Municipal Council sought government assistance to establish a water supply on a catchment outside the Council's jurisdiction, the government quickly moved (1863) to establish a separate Brisbane Board of Water Works. (5)

Serious deterioration in health and the outbreak of Bubonic Plague in the 1900s as a result of the lack of sanitation, forced local government authorities to seek government carriage of sewerage scheme. The powers of the Brisbane Board of Waterworks were extended to incorporate
responsibility for the provision of a sewerage scheme. The adopted scheme comprised a major outfall sewer, the provision of a sewage farm at Eagle Farm, and the construction of an ocean outfall sewer.

The issues confronting the Melbourne water supply were problems of water quality, while Sydney and Adelaide were more concerned with reliability of supply. Brisbane was concerned with both reliability and water quality problems. All cities were concerned with the establishment of an effective sanitation system. The requirement for the provision of major capital works, the establishment of major works outside local government jurisdiction, and the need to recover costs based on a system of property rates, necessitated the establishment of a new order of administrative arrangements.

Consequently, underlying the establishment of the authorities were specific proposals (strategies) regarding the means of resolving the social issues of the day, viz: the provision of safe and reliable water supply and the provision of effective sanitation. In addition, the enquiries leading to the establishment of the authorities identified the techniques for the implementation of these strategies, viz: the construction of large dams on remote streams to regulate flow, the construction of conduits for transfer of water to the metropolitan areas, and the construction of main and outfall sewers and sewage farms.

These primary tasks were reflected in the prescriptive nature of empowering legislation which established the organisations. The ends were universally accepted, with major focus on the technical means of implementation of the services.

2.3.2 Scarcity of productive land

The squatter alienation of the majority of viable agricultural land in Victoria in the period 1830 to 1850 set in train a number of socio-political processes of importance to this analysis. These included the 'unlock the land' movement of the 1860s which committed Governments to the support of the small farmer and 'selector', and to the provision of rural water supply and irrigation as the means of opening up otherwise marginal tracts of land for occupation (Refer to Figure 2.5). Given the much greater pressure on land in Victoria, it is not surprising that it was this colony that led the way in the promotion of irrigation. By limiting agriculture to those areas south of the Goyder Line, South Australia avoided the demands for rural water supply in marginal agricultural areas.

Many selectors suffered severe social and economic
FIGURE 2.5  SETTLEMENT (LAND OCCUPATION) AS A PERCENTAGE
OF Viable Agricultural Land

* based on dryland farming
# based on irrigation
deprivation through the 1880s and 90s as a result of vagaries in climate and market prices, the lack of agricultural equipment and capital, and inadequate transportation. The plight of the selectors placed a number of government land settlement schemes in financial difficulty and necessitated further government intervention in the provision of reliable water supplies.

The droughts of the 1890s and 1900s forced many of the selectors and small farmers off their land. Deakin observed in 1903 that, by the mid-1890s, irrigation had become synonomous with large and irrecoverable expenditure by the State. Works had been undertaken with insufficient knowledge of variations in streamflow and rainfall. Other factors were the loss in confidence during the depression of the late 1890s and human and technical shortcomings. (6)

The earlier government involvement in providing the selectors with land now obligated the Government to resolve the problem. Governments absorbed the debts of earlier irrigation Trusts, and undertook to provide the large headworks at government (free) cost.

Soldier Settlement followed a similar pattern, with a need for governments to find productive land upon which to establish the returned soldiers as a reward for services rendered to the nation.

Consequently, there arose the perception within the authorities and rural communities of government commitment to the provision of water supplies at substantially subsidised rates. This was legitimated on the basis of promoting closer settlement.

2.3.3 Economic deprivation of rural communities

In the case of the rural communities, droughts took a heavy toll on stock. Following the severe droughts in the 1860s, colonial governments implemented works for the provision of stock water supply in the four colonies.

Extensive systems of bore water supply were established in NSW, SA and Queensland, while extensive water supply channels were constructed in the Mallee and Wimmera districts in Victoria.

The dispersed nature of rural settlement associated with the pastoral industry limited the development of rural populations, and underlay the belief in 'closer settlement' throughout the 1880s to 1930s as the means of the initiation of self-sustained economic growth and prosperity in rural areas. The isolation of rural communities also generated conservatism and a feeling of disparity between government support of rural areas as opposed to the large
urban areas. This was to provide the basis of the rural-urban dichotomy and the development of a disproportionate distribution of voting in favour of the rural electorate. These factors significantly influenced political support for rural water supply programmes well into the 1960s.

Following the 1880 to 33 drought, the Victorian Government appointed a Royal Commission (Deakin) to inquire into rural water supply problems. The Royal Commission recommended in 1886 that:

- the ownership of water be vested in the Crown;
- the existing Irrigation and Water Supply Trusts be retained;
- irrigation development be assisted by government provision of loans and 'free' national headworks;
- the major works be undertaken by a separate Department of Water Supply. (7)

Following skirmishes over stream diversion in the Riverina in the 1880s, NSW enacted similar legislation vesting the ownership of waters in the Crown. (8)

Rural communities were faced with severe social and economic deprivation as a result of heavy stock and crop losses during the droughts of the 1890s and 1900s and the decline in the export market. With the exception of the Mildura Irrigation Trust, the local Water Trusts established during the 1880s were unable to withstand the severity of the 1897 to 1904 drought, and were consequently unable to repay their loans.

The attempt to tie the provision of rural water supply to Local Government type authorities had failed in the case of irrigation and small rural towns, as a consequence of the sparse nature of the rural population and associated poor economies of scale. The failure of rural water supply authorities was also a reflection of the inadequate provision of headworks to withstand such severe conditions as the 1897 to 1903 drought. (9)

Hence, there was considerable focus on the provision by Government of 'national headworks' as the basis of secure water supply. As noted previously, the debts of the Irrigation Trusts were written off by Government, and 'free' provision of national headworks was proposed.

The continued belief in closer settlement as a basis of rural prosperity provided a basis for further government investment in irrigation water supply. While it was accepted that irrigation water supply was not economically viable in the short term, it was considered that with ultimate intensification of settlement, such enterprise would become viable.
The Victorian (Swinburne) investigation into failure of the irrigation Trusts (1904) concluded that the concept of irrigation development as a basis for promoting closer settlement was still viable, providing that it was properly implemented. Successful implementation was dependent on being able to:
- promote more intensive use of irrigation water;
- compel payment for water rights by all landholders in a declared Irrigation District;
- provide a reliable supply of water.

The Victorian Water Act of 1905 abolished the Trusts and established a new central Departmental Corporation to undertake directly the construction and development of land for irrigation, and the administration of a programme of closer settlement. (10)

The model was followed by other States, although NSW was cautious regarding the viability of 'intensive' irrigation development.

The entry of NSW into the area of irrigation, as opposed to stock water supply, appears to have been significantly influenced by the need to justify its claims to Murray water during the long and bitter debate over the rights to Murray waters prior to the River Murray Agreement in 1914. The Riverina 'New State' movement and agitation of Riverina land holders for the provision of water supply were further factors requiring government expenditure in the Murrumbidgee area. (11)

The NSW government embarked on the development of an irrigation scheme in 1909, with the establishment of a central body (WCIC) in 1914 to administer the area. (12)

Given the dominance in South Australia of the yeoman farmers, the early adoption by government of a policy of limiting agriculture to the area south of the Goyder Line, and the extremely limited nature of water resources of the colony, the provision of irrigation, with the exception of the Murray River settlements, was not an issue.

Given the importance of land as the major field of investment however, and the frequency of droughts during the 1880s to 90s period, the provision of stock and rural town water supplies emerged in the later part of the nineteenth century as an important issue. (13)

In view of the overlap and lack of co-ordination existing in water resource development in the 1880s, the government amalgamated the various authorities into the Engineer-in-Chief's Department in 1888. (14)

A separate Hydraulic Engineers Department (the forerunner to the EWSD) was established in 1902 to administer Adelaide's water supply and sewerage and to undertake rural water supply. (15)

In the case of Queensland, the initial settlement was based
on the pastoral expansion from NSW in the inland areas. Given the unreliability of flow of inland streams, the pastoralist interests demanded government provision of stock water supply from an early date. The development of stock water supply was based on the exploitation of the Great Artesian Basin.

Not until 1922 as part of a 'New Deal for Farmers' did the Queensland government undertake programmes of irrigation water supply. (16) The Irrigation Act of 1922 established the Office of Commissioner of Irrigation & Water Supply, the forerunner to the Qld IWSC.

The devolution of rural water supply authorities is illustrated in Figure 2.2.

Consequently, the primary tasks in the case of rural water supply organisations comprised the provision of large headworks at Government cost, to ensure sufficient and reliable supply of water for stock watering and irrigation purposes.

2.4 Issues underlying the establishment of the authorities which required successful attainment of particular goals

What were the underlying political issues which required the successful attainment of particular goals, and what were the implications of these issues for the organisation's perceived primary tasks, implementation strategies, values and perspectives?

2.4.1 Removal of responsibility for the provision of services from local government

The early attempts to vest the responsibility for the provision of services in local government authorities were unsuccessful. The inability of local government authorities to provide an adequate level of service was a reflection of:

- the lack of entrepreneurial skills;
- the lack of technical and capital resources;
- the difficulties incurred where inadequate local sources of water supply required the harvesting of water from areas remote from local government authority jurisdiction;
- the difficulties of administration of networks overlapping a number of local government authority areas;
- the inability of authorities to meet the high cost and front-ended capital nature of development from a source of finance dependent on rates.
In most cases, the responsibility for water supply was transferred to Water Supply Commissioners established by the Colonial Governments. The Commissioners were subsequently absorbed into Public Works Departments in most cases, primarily in order to gain access to wider technical and financial resources.

The advent of sewerage required the establishment of a system of land or property rating as the means of recovering costs, a process traditionally covered by the establishment of a locally elected authority. The instrument adopted by Victoria, NSW and initially Queensland was the Public Corporation or Water Board, composed of nominated members of local government authorities covered by the Board's area of jurisdiction. South Australia continued to utilise a Public Works related department, while the establishment of a Greater Brisbane City Council ultimately enabled the provision of services to revert back to a local government based authority. The devolution of urban water authorities is illustrated in Figure 2.1

Except for a short break from 1853 to 57, local government authorities in Sydney had an extensive involvement in the provision of water supply and sanitation services. Consequently, the new Water Board faced considerable hostility from the authorities as a result of the transfer of the responsibility. The limited representation of local authorities on the new Board, did little to assuage this hostility.

In the case of Melbourne on the other hand, local government authorities had a limited history of water supply and sanitation provision. Consequently, the new Melbourne Board faced little hostility from the authorities. The extensive representation (initially 37) of local government authorities on the Board also aided in minimising opposition to the new Board.

In the case of Adelaide, local government had played an important role in the provision of water supply prior to the granting of responsible government in 1855. Consequently, the City Works and Drainage Commission established by the government in 1856 was confronted by hostile local government authorities, such that the government was forced to transfer the responsibility to the Public Works Department in 1858.

The Brisbane Municipal Council lost responsibility for water supply within 4 years of its incorporation. The Brisbane Board of Waterworks comprised the Secretary for Works, the Surveyor General, and the Mayor of the Brisbane Municipal Council.

As noted in Section 2.3.3 above, the early provision of
rural water supply was also tied to local government authorities, with locally elected members and powers to raise loans and levy rates. Following the 1880 to 83 drought, Victoria introduced legislation in 1886 providing for the establishment of Irrigation and Water Supply Trusts, with direct provision of loans and major 'national' works by government.

Following the 1897-1903 drought, most of the Victorian Irrigation Trusts were in financial ruins, necessitating government acceptance of a huge debt, and the enactment of legislation providing for direct government provision of water supply for rural areas. The centralised government development and provision of water supply required the acceptance by government of the headworks costs, and the declaration of Irrigation Districts as an instrument for allocating, distributing and charging for water supply. The devolution in rural water supply arrangements is illustrated in Figure 2.2.

There was little opposition to the government takeover of the Irrigation Trusts, given the hopeless financial position of the Trusts, the government acceptance of their debt, and the access provided to 'free national headworks' as a result of the government assumption of responsibility.

In summary, in the case of the urban authorities, considerable hostility was engendered as a result of the transfer of traditional local government responsibilities to the new Public Corporations. This hostility was contained by:

- limiting the new authorities to narrow highly prescribed statutory functions;
- providing for representation of local government on Boards;
- paying particular attention to effectiveness in the provision of services in a manner consistent with utilitarian principles.

This required that the new authorities pay particular attention to:

- strict compliance with their statutes;
- securing the technical and financial resources necessary for the effective implementation of works and provision of services;
- the provision of services without favour, based strictly on need (demand);
- the adoption of sound financial management practices.

2.4.2 Relegation of powers by parliament

Until the mid-1870s, governments of the period were short-lived, with ministerial responsibility frequently shifting. The early administration of water supply by
governments was characterised by:
- patronage and political interference in Department activities as part of a political style prior to the emergence of party politics;
- political interference in the local interest, to the detriment of the general interest.

In contrast, the continuity of public officials and their technical proficiency in such enterprises as the railways engendered wide public support.

As noted in Section 2.4.1 above, the provision of sewerage required the adoption of property rates as the basis of equitable recovery of costs, i.e. the establishment of a local authority-type organisation. At the same time, it was important to ensure that the resources of government were available to the new organisation to ensure the effective implementation of works. The solution adopted to these requirements was the establishment of Public Corporations with separate legal identity, and powers to levy rates, raise loans, set bylaws, and to undertake works.

The adoption of the Public Corporation as an instrument of government represented a significant relegation of parliamentary power. This relegation of power was accepted on the basis that:
- activities of the authorities would be limited to those directly related to implementation of the services identified in the statutes;
- authorities would be required to behave in strict compliance with laws and expectations of sound administrative practice;
- services would be provided without favour on the basis of need (demand);
- authorities would be effective in the provision of services.
2.5 Local values, perspectives and ideologies

What were the local values, perspectives and ideologies of the day?

2.5.1 Political ideology and interest groups

There are a number of features of initial settlement and of the process of attainment of representative government which are of importance to this analysis. One factor which has been central to the analysis of the selected authorities has been the political focus on material progress.

The lack of ideological conflict and the early attainment of universal enfranchisement meant that distribution of power and wealth were not major issues. Politics tended to be pragmatic with major focus on material progress. Therefore, the major political and administrative focus was one of the technical means of implementation of services. Where conflicts occurred, they revolved around charges of technical incompetence, not questions of allocation of resources.

It is probable that a number of other factors reinforced the primary focus on the provision of material needs. The level of infant mortality and disease in the urban areas as a result of inadequate water supply, sanitation and drainage, demanded urgent action on the part of the authorities. The level of economic and social deprivation in the rural areas as a result of the vagaries of climate and markets similarly demanded urgent action. Finally, natural resources (land, forest, minerals, water) were vested in the Crown, giving the government, through its agencies, the authority to allocate the right to the use of the resources.

The implications of these perspectives for public authority administration were:

- broad support for government programmes of infrastructure development and provision of services;
- internal focus on technical competence rather than on questions of power or distribution of resources.

A number of important differences in ideologies and perspectives existed between the states. NSW as the mother colony had a long history of administration and of growth in property interests prior to independence. Consequently, in its early history, the NSW government demonstrated greater maturity (and resistance to the demands of pressure groups) than the other colonies. (17)

The circumstances of Victoria's separation from NSW and the subsequent trade competition between the two colonies
created a situation of bitter rivalry and mistrust which was to surface in terms of conflict over the River Murray. The rights won by the miners at Eureka, and the role of government in championing the rights of the selectors against the squatters, meant that politics in Victoria was strongly orientated towards the interests of the small farmer and the urban bourgeois.

The Chartist Movement was a major factor influencing the South Australian Constitution and early development and growth. Reid, Blair and Sainsbury state that "The constitution of 1836 enshrined the ideals of the founders of the province." Reid at al conclude that the founders were satisfied with the constitution in that it secured the pick of the land, cheap labour, religious liberty, separation of the church and the state, manhood suffrage, secret ballot, and independence from Whitehall. "Under this favourable constitution, and roughly within the limits of Goyder's line, a yeoman proprietary developed." (18) Politics were played out by a mixture of small farmers and urban middle class who prized their economic and political independence. By 1912, all members elected were members of either the Labor Party or the Liberal Unions.

Queensland was initially settled as part of the pastoral expansion in northern NSW. It is the most decentralised state in terms of both settlement and local government. Queensland politics are the politics of development, concerned with schemes to beat the drought rather than ideology. (19) The powerful pastoral interests placed early demands on government for the provision of stock water supply.

In the late 1880s, there was growth in the interest in social democracy and the union movement, leading to conflict between labour and employers over wages and the rights of the unions to determine employment conditions. An electoral Labour League was formed to pursue political equality, universal male franchise, state aid to the needy, the use of the state for the wider community well-being, and the regulation of employment conditions. The major strand of the Labor platform was the commitment to state welfare and the achievement of social harmony through state regulation. (20)

With the emergence of a Labor Party in the early 1900s, politics took on a new grouping of Labor versus non-Labor interests. Colonial liberalism embraced the principles of municipal socialism and the advancement of the living standards of the working class. The Deakinite liberals began state socialism through the establishment of state-owned utilities.

The liberals introduced administrative reforms and accepted the right of citizens to the protection of material
well-being by government. Deakin argued that it was better to compromise and embrace socialist forces rather than to risk revolution.

The compromise between conservatives and labour on political institutions and the role of the state comprised the following elements of a mildly interventionist creed:

- a traditional role of government in the provision of infrastructure;
- ownership of land, minerals and water vested in the crown;
- provision by government of land, transport, railways, and irrigation infrastructure;
- a partnership of free enterprise and the state in economic development;
- a responsibility of government to regulate free enterprise. (21)

The Country Party concern was one of sectional interests; the pastoralists and the farmers. In NSW, the Country Party identified with the big farmer, whereas in Victoria, the Party identified with the small farmer and bourgeois radicals; in SA, with the yeomanry farmers; and in Queensland, with the wheat, fruit, sugar and dairy farmers along the coast. The Party exploited its influence in the National-Country Party Coalitions in the period 1919 to 1929 to achieve significant gains for the rural sector.

2.5.2 Hostility to authority

The critical shortage of labour was another factor which significantly influenced social attitudes and the principles of government provision of services. Manning Clark notes that the pervasiveness of the egalitarian ideology had always depended heavily on the shortage of labour, which corroded the centuries old fear of the employer, and with it one of the pillars of inequality. Thus, the labour market, not the gold diggers or the Chartists, was one of the great creators of social equality in Australia. (22)

Engel suggests that egalitarianism induced a hostility towards aristocracy, authority and privilege. The conflict between 'anti-intellectualism' and the 'special knowledge' needs of industrial society were resolved by elevating the 'practical expert' rather than the intellectual. In the colonial bureaucracies, the superior status of the professional man was recognised from an early date. (23)

Emy argues that the timeless continent has led to a different perspective regarding the urgency of political participation, or of the economic individualism debate that dominated Europe. "In Australia, the easier material conditions of existence for the majority, plus the early
attainment of formal democracy, removed the urgency from such causes of political conflict and prevented both the experience of such conflict, and the accompanying theoretical debate on the form of 'political solution' to be imposed upon society, from having the same prolonged educative and informative effects upon the electorate that these had in England. The struggle between capital and labour in general, and the emotive force of such ideals as liberalism and socialism, have not been so deeply entrenched in the Australian political experience". (24)

"In England, the impact of democratisation and the formation of such social ideals as social equality, was contained within an established social structure in which the public order and the political function were associated with the the natural function of the governing class, and the deferential respect for this class rubbed off on the institutions themselves, giving them an added aura of legitimacy. Whereas in Australia, the very reverse happened: reaction against the idea of a ruling class, particularly one associated with an English culture, brought with it a reaction against the political institutions of that class, implicitly undermining their legitimacy. So that we have a curious inversion that in Australia, one is not obligated to the State, but rather, the State is obligated to the individual". (25)

These observations contain a number of conclusions of importance to a legitimation theory of action. Firstly, the State's source of authority lay not in the 'natural function of the governing class', but rather in the provision of services in response to needs as a practical application of utilitarian principles, i.e. not only were there no obstacles to the role of the State, but there was also an expectation that the State would provide services. Only the means of implementing the services were in question.

Underlying this perspective was a egalitarian sentiment and a citizenry rejection of a ruling class and its institutions in the polity.

Secondly, associated with egalitarianism and the hostility towards aristocracy, authority and privilege, there was a strong anti-intellectual attitude. Consequently, administration was limited to the support of technical action and the 'practical expert' associated with the provision of services.

Thirdly, the egalitarian sentiment has underpinned the 'right of every Australian to a minimum standard of living', an ethic that prevails to this day.
2.5.3 Inter-colonial rivalry, rural conservatism, and the urban-rural dichotomy

The isolated nature of settlements necessitated the establishment of a local administration for each of the colonies, which led to insularity and inter-colonial jealousy in the pursuit of trade. Before the opening of routes into the hinterland and the advent of rail (1850s), the sea was the only line of communication. Water based transport remained the only really viable form of transport well into the 1840s. (26)

When transport routes were constructed, they generally radiated out from the established settlements, thereby providing the established settlements with domination of trade and communication with the hinterland settlement, i.e. physical factors established at an early date the pattern of highly centralised administration which was to characterise the organisations under analysis. Queensland was an exception to this pattern. (27)

The concentration of a large population (markets, and a source of labour) adjacent to a port, and the dispersed nature of the colonies, also meant that the major urban areas had a natural advantage over other settlements in terms of growth as manufacturing and commercial centres. This commercial and manufacturing advantage was sealed by the construction of a system of railways which radiated out from the metropolitan centres (with the exception of Brisbane).

The factors of distance and size which encouraged the early centralisation of authority and decision making in the main urban centres meant that politics were remote from the life of and concerns of the interior, so creating the basis for the rural-urban dichotomy. The real source of resistance to change is to be found in the politics of the rural sector, which derives from factors of insulation, isolation, and parochialism. (28)

The dispersed nature of rural settlement associated with the pastoral industry limited the development of rural populations and underlay the belief in 'closer settlement' throughout the 1880s to 1930s as the means of the initiation of self-sustained growth in rural areas.

Growth in rural populations was limited after 1891, leading to a steady increase in the percentage of urban population, from 30% in 1881 to 70% in 1980. Queensland is an exception to this pattern. An associated feature of this trend was the emergence of grossly disproportionate electoral representation systems, with strong biases in favour of the rural electorates. (Refer to Table 2.2)
<table>
<thead>
<tr>
<th>Period</th>
<th>Victoria</th>
<th>NSW</th>
<th>SA</th>
<th>Queensland</th>
</tr>
</thead>
<tbody>
<tr>
<td>1900s</td>
<td>100 to 73</td>
<td>100 to 100</td>
<td>100 to 100</td>
<td>100 to 100</td>
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<tr>
<td>1910s</td>
<td>100 to 60</td>
<td>100 to 100</td>
<td>100 to 100</td>
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<tr>
<td>1920s</td>
<td>100 to 37</td>
<td>100 to 92</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1930s</td>
<td>100 to 47</td>
<td>100 to 70</td>
<td>100 to 33</td>
<td></td>
</tr>
<tr>
<td>1940s</td>
<td>100 to 37</td>
<td>100 to 60</td>
<td>100 to 30</td>
<td>100 to 43</td>
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<tr>
<td>1950s</td>
<td>100 to 60</td>
<td>100 to 74</td>
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<td>100 to 37</td>
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<tr>
<td>1960s</td>
<td>100 to 60</td>
<td>100 to 76</td>
<td>100 to 25</td>
<td></td>
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<tr>
<td>1970s</td>
<td>100 to 60</td>
<td>100 to 72</td>
<td>100 to 67</td>
<td></td>
</tr>
</tbody>
</table>

In summary, the inter-colonial jealousy meant that policy initiatives or development programmes in one colony were likely to be emulated by other colonies, and that the rights to the use of jointly shared resources such as the River Murray were bitterly contested. The rural conservatism limited governments in respect to the type of programmes and administrative instruments that could be employed. This conservatism together with the rural perception of governments favouring the urban areas, necessitated subsidisation by governments of rural programmes.
2.5.4 The role of government

(a) Derivative sources

The legal and administrative authority delegated to public organisations will be constrained in the first instance by prevailing norms regarding the role of government.

What were the norms regarding the role of government prevailing at the time of establishment of the authorities? Early government functions and administrative practice were significantly influenced by British practice. This was a reflection of the earlier British administration and of the perspectives and ideals that the settlers brought with them. Settlers from the Midlands and North of England in particular had been exposed to the ideals of the Chartist Movement and Trade Unionism and had witnessed the great improvement in social conditions resulting from Municipal Socialism.

Arising out of the Industrial Revolution, with its associated disruption of traditional patterns, the massing of people in the towns, and the torrent of abuses, poverty and disease, there was a need for administrative reform. The Utilitarians (Bentham & Mill) broke with the belief in natural rights, and argued that the role of government was to provide the greatest happiness for the greatest number. Bentham argued that the origin of laws and the obligation to obey them were derived from the principle of utility. (29)

The Utilitarians (30) viewed the role of the state as:
- the protection of the weak;
- the maintenance of institutions in the general interest;
- the direct provision of services of a monopolistic nature, as the most effective means of their control.

While the Capitalist/Liberal philosophy of the mid to late nineteenth century was one of non-market intervention, it was recognised that the state had a responsibility to intervene in the market system (31, 32) where:
- the provision of services required a collective action in order to secure the general utility;
- the under-developed nature of the economy required direct government provision of infrastructure to initiate self sustaining growth;
- the correction of market weaknesses was required in the general interest;
- the provision of non-marketable services were required in the general interest.

The evolution of government administration in Britain involved a shift from the belief in individual rights characterised by Smith and laissez-faire economics, to the
view that the state had a responsibility to directly intervene in the market system where the general community interest was in question, but not otherwise. The Lockean concept of individual rights as inalienable and personal was further modified by the Oxford Idealists (1890-1914), who argued that the state had the duty to relegate individual rights in the wider community interest.

The Fabians sought administrative reform and increased social provision through the extension of municipal socialism, while the Liberals viewed municipal socialism as a compromise between laissez-faire and national socialism. Sidney Webb noted that in the latter part of the nineteenth and early twentieth century, the concept of a 'state' role in the economy was still considered repugnant to the ideal of individualism. This viewpoint, he noted, overlooked the existing extent of such activity, particularly in such municipal socialism as the provision of gas, water supply, and Post Office services. All this had been achieved by 'practical' men, ignorant of any scientific sociology, anti-socialist in values, and ignoring the claims for social reconstruction. Unconsciously, they had worked to bring about the very socialism that they despised, and to destroy the individualistic faith that they still professed. (33)

In summary, the role of Government in the provision of services was perceived as legitimate where:
- collective action was required in order to secure the general utility;
- action was required in order to correct a weakness in the market, as in the case of monopolies;
- action was required to provide a non-marketable service in the general interest;
- direct government provision of infrastructure was required in the case of under-developed economies, to initiate self sustaining economic growth.

(b) Local adaptations

The origin and nature of settlement played an important role in the subsequent development of each of the colonies. The decision to establish European settlement on a new continent required direct government action in the establishment of the physical and social infrastructure and in the administration of the settlement. Each colony had to provide the railways, education, hospitals, and often brickworks and abattoirs to house and feed people. (34)

Of considerable importance to this analysis was the view held by the citizens that the state not only was not a threat to individual liberties, but that it offered an instrument for the betterment of the individual's lot. This extraordinary situation has been described in the work of
such writers as Hancock, Eggleston, Encel, and Emy. Emy argues that "The environmental circumstances (of settlement) supported the instrumental theme of the state as 'a vast public utility', while the view of politics as a continuous and timeless exercise in 'development' was the only viable policy open to small and scattered communities". (35)

Hancock observed that "The Australian democracy has come to look upon the State as a vast public utility, whose duty it is to provide the greatest happiness for the greatest number. --- To the Australian, the State means collective power at the service of the individualistic 'rights'." (36)

Hancock argues that State action was the result of egalitarian pressure which was, in its turn, the local version of the nineteenth century British individualism. To the Australian, the state means collective power at the service of individualistic rights. Therefore, he sees no opposition between his individualism and his reliance upon the government. 'Needs' provided the basis of government provision of services, where the identification of the 'needs' was devoid of any intellectual debate, and the provision of services responsive to these needs was a practical application of utilitarian principles. (37)

Eggleston, in commenting on the scope and importance of state action in Australia, concluded that "state Socialism in Victoria has been the result of a demand that the State shall be definitely used to secure social and economic objectives." (38)

The Capitalist-Liberal economic philosophy of the day accepted a state role in the provision of infrastructure in the case of under-developed countries as the means of initiation of self sustained economic growth. Mathews (39) argues that the extent of the private sector role in the economic development of a country is dependent on five main factors:

- a prosperous agricultural sector;
- the acceptance of large inequalities in income;
- the acceptance of low standards of personal consumption and a high rate of personal savings;
- cheap transport; and
- ready access to essential commodities such as capital.

Few of these conditions were met in nineteenth century Australia.

The second half of the nineteenth century was witness to large scale public action to attract resources of capital and labour from Britain and to the provision of services on a scale that was rare in the western world. Combined with these activities, governments were the landlords of most of the Australian continent. The outcome was the widespread
public and private acceptance of a strongly supportive role of government vis-a-vis major private interests through direct market participation by government. One of the consequences of this mode of direct government intervention was the development of large scale public business undertakings, most importantly in transport and communications, but also in the urban amenities of water supply and sewerage. (40)

(c) Summary

The environmental circumstances of settlement, and the perception of the state as collective power at the service of individualistic rights, supported the instrumental theme of the state as a vast public utility. The collective interest or need therefore provided the basis for government action.

2.5.5 Economic perspectives and strategies

Australia's economic development followed the classical pattern of development through the establishment of the highly productive rural economy with the progressive re-orientation toward industrial activity. The critical problems of the middle of the nineteenth century were the intense shortages of labour and capital. (41)

Sinclair describes the model of economic development of Australia as one of the exploitation of natural resources (the higher marginal productivity of new land) as the basis of attracting labour, capital, and entrepreneurship. These factors enabled improvement in productivity, thereby maintaining the competitive edge necessary to continue to attract further labour, capital, and entrepreneurship. This was the dominant mechanism driving development over the 1820-1920 period. (42)

This 'exploitation of natural resources' or 'Staple theory - export led economic development' model is described schematically in Figure 2.6. This model has a number of implications for sources of legitimation guiding public authorities. The 'exploitation of natural resources' based economy generated the demands for rural and irrigation water supply and required government intervention in the provision of capital and infrastructure.

Sinclair identifies three major phases of the 'exploitation of natural resources' model. In the period 1820-1850, the major export commodity was wool, with grazing proceeding on a low capital investment basis. Growth in production in this period was dependent on bringing new tracts of land into production, and coincided with the opening up of the hinterland. This pattern of economic growth was central to growth in NSW and Victoria in this period. (43)
FIGURE 2.6 EXPLOITATION OF NATURAL RESOURCES MODEL

While wool remained the major export commodity, in the second phase (1850-1890s), growth in production was now dependent upon improved production techniques (fencing, water conservation) which required a high capital investment. Governments played an important role in this phase in terms of the provision of transport and water supply infrastructure. (44)

The 1890s depression, and the drought at the turn of the century, brought an end to wool as the key export and focus of foreign investment. This shift in relative profitability induced significant changes in the composition of the economy, with shifts towards manufacturing and non-wool land uses. (45) After 1877, there was a significant rise in the growth of manufacturing industry in the major urban centres. (46)

The shift to manufacturing was necessitated by the alienation by the squatters of most of the well watered and open country in Victoria and NSW in the period 1830 to 1850. The establishment of the pastoral industry in Queensland was primarily located on the open inland plains. Government development of the Great Artesian Basin, and the provision of watered stock routes, greatly facilitated this development. South Australia continued to pursue a pattern of yeomanry farming, excluding the pastoral industry from viable agricultural land.
2.5.6 Legal and administrative jurisdiction of public authorities

(a) Derivative sources

The concepts of public authorities grew out of the Courts of Sewers of the middle ages in Britain. This communal co-operation was the result of a recognition from time immemorial of the inter-dependency of farmers in respect to the construction and maintenance of drains and dykes to protect crops from the ravages of floods and the sea. These local arrangements were given the authority of the King in 1520, with the enactment of the Statute of Sewers. The Statute provided for the appointment of Commissioners by the King to co-ordinate the works and the Courts. (47)

With the increased growth in commerce and traffic in the early eighteenth century, and the massing of people in towns, increasing use was made of Special Purpose Authorities. Commissions were created by Parliament in a number of cases to take over major engineering or administrative enterprises. (48)

The Municipal Corporations were slow to respond to the problems associated with growth in the towns, and consequently separate Improvement Commissions were created to deal with such issues as lighting, paving and cleansing. Under the 1835 Municipal Corporation Act, the Improvement Commissions were merged into Town Councils. In the case of London, in view of the scale of engineering problems and the fragmented administration of the area, the Metropolitan Sewer Commission and the Improvement Commissions were merged into the Metropolitan Board of Works in 1855. The Board was absorbed into the London County Council in 1889. (49)

Both Mill and Chadwick were firm believers in the benefits of expert bodies of appointed officers as the most efficient means of public administration. Chadwick was impatient of Parliamentary control and championed the use of expert appointed officers in public administration and the implementation of services. Chadwick favoured the adoption of special purpose authorities, established by the Crown, with elected representatives of consumers on the Board of Guardians, and implementation undertaken by a body of appointed and qualified officers. (50)

Mill viewed public administration as a skilled business and considered that it therefore needed to be free of Parliamentary interference. Administration should be under the direction of a single appointed official. Delegated responsibility had the advantage of no duties except to the governed. Such administration was composed of persons with qualifications and expert knowledge, and for whom administration was the major occupation. Officials had a
permanent interest in the success of their administration. (51)

Public authorities were based on associations of consumers, with government by elected representatives, and the adoption of a cash nexus between the ratepayers and the level of service demanded. The reasons given by Mill for removing the public utilities from the control of Parliament included the need to free them from political interference, and to secure the benefits of commercial management. (52)

Following a period of unsuccessful experiment with government agencies in England in the 1860s, Bagehot wrote in 1867 that government administration by independent authorities has often been tried but has always failed, due to the denigration of their administration by Parliament. (53) The view of politics and administration as opposite functions was cultivated in the later part of the nineteenth century, to aid the development of an expert career service. Only when the politicians were convinced that civil servants had no power in their own right were they prepared to relinquish the control they had always exercised over civil service appointments through the device of patronage. The theory therefore developed that politics involves the making of decisions and administration simply the implementation of decisions. (54)

Municipal trading covered such monopolies as the provision of water, gas, transport and port facilities. Local Government bodies were empowered under the Public Health Act of 1848 to acquire water supply companies and Boards. (55)

(b) Local adaptations

The viable form of administrative instruments available to government are determined by a juxtaposition of the concepts of democratic rights of the individual, the severity of deprivation resulting from the withholding of the service, and the technical and financial exigencies of the undertaking. These are the factors underlying the evolution of the forms of instruments of government in Australia.

As noted earlier, state action was the result of egalitarian pressure. "To the Australian, the State meant collective power at the service of the individualistic rights." (56) Consequently, the establishment of public authorities was not so much a question of relegation of individual rights, but rather an expectation of use of the state in the provision of services in the interest of the individual. Therefore, the citizens were not so much concerned with representation on the authorities or with government control as with their performance in terms of
effective delivery of services.

The difficulties encountered by local government in the early delivery of services and the subsequent devolution of administrative forms, were outlined in Sections 2.2 and 2.4.1, and illustrated in Figure 2.1. Similarly, the early establishment of rural water supply administration was based on local government principles. The difficulties encountered by the early authorities and the devolution of administrative forms, were outlined in Sections 2.2 & 2.3.3, and illustrated in Figure 2.2.

The early inefficiency of local and colonial governments in the direct provision of infrastructure and services was a reflection of political interference of elected officials in favour of local interests and individuals. The Australian railway corporations provided the original administrative pattern for statutory trading authorities in Australia. (57)

In 1883, the Victorian government established the Railway Commissioners as a corporate body independent of the Minister, but responsible to Parliament, as the means of resolving problems of patronage and political interference in railway construction. (58) This model was slightly varied in the case of NSW, where the statutes prescribed the broad principles of the enterprise, with responsibility for implementation and operation vested in the Railway Commissioners. The ministry was responsible for ensuring that the commissioners carried out the provisions of the Act, while parliamentary control was limited to either turning out the ministry, or amending the Act. (59)

2.5.7 Administrative practice

(a) Derivative sources

Nineteenth century British administration was plagued with problems of jobbery within a 'closed administration', the displacement of technical considerations and formal rules by local interests, and deficiencies in public accounting. The Reform Bill of 1814 required public tendering, publication of accounts, abolition of fees of office, and the extension of rating powers to the whole service area.

The inquiries conducted by Chadwick proposed major modification to the administration of municipal and special purpose authorities, with power to raise loans for the construction of services, and power to appoint experts and salaried staff to undertake the works. (60)

Finer described the approach adopted to management by Municipal Trading authorities in the early twentieth century. The Council would appoint a series of Standing
Committees to manage the various departments of the Council. The Committees had responsibility for the framing of bylaws, examination of accounts, and framing of estimates. The Engineer-in-Chief had responsibility for the execution of works and the maintenance of technical records (61).

The Municipal Corporation Act of 1882 determined the principles of accounting for statutory authorities, and required the implementation of annual audits. Principles of book keeping were well established through commerce, and regulatory concepts established through the Poor Law Boards.

(b) Local adaptations

In the case of the urban authorities, there was an expectation that organisations would be financially viable. Consequently, mechanisms were required to recover the cost of delivery of services. In the case of the water authorities, the system of property or water rates was adopted as the most equitable means of recovering costs of services which benefit the area as a whole. Hence, either voluntary associations or Local Government areas were adopted, not as a means of making authorities accountable to citizens (protection of individual rights), but rather as an administrative mechanism for collecting revenue for the financing of works and services.

(c) Summary

The basis of support for the statutory authorities comprised the following requirements:

- the adoption of an association of consumers, governed by elected officials, as the administrative means of setting and collecting charges, and as the basis of local autonomy;
- the provision of services upon demand;
- the adoption of commercially based management, with revenue sufficient to cover costs of provision of services;
- the provision of an annual audit and the publication of annual accounts;
- the allocation of services and setting of charges in an equitable manner, with dispensation for the poor;
- the compliance with the law;
- the maintenance of a nexus between charges for services and the level of services provided;
- the provision of services in a technically efficient and expert manner;
- the delegation of administration to a corps of trained officers, supervised by elected officials;
- the use of standing committees of elected officials to manage the various departments, frame by-laws, examine records and set rates.
In the case of the rural water supplies, the expectations of public authority behaviour included:

- the direct provision by Government of water supplies based on demand;
- the provision of services in a technically expert and efficient manner;
- the free provision of 'national' headworks, and acceptance by Government of costs over a 'fair' charge to rural water consumers;
- the allocation of water resources (vested in the Crown) based on the general interest;
- the adoption of charges based on water rights as the equitable basis for recovering costs;
- the adoption of an association of consumers as the administrative means of setting rates and collecting rates;
- the delegation of administration to a corps of trained officers, responsible to a statutory officer.

2.6 Implications for the legitimation hypothesis

This Chapter has identified a number of factors of importance to perceptions of primary goals, critical performance areas, underlying strategies, and organisation ideology, perspectives and norms. These factors are summarised in Tables 2.4 (a), (b) & (c).
<table>
<thead>
<tr>
<th>Issues &amp; underlying Strategies for their resolution</th>
<th>Perceived Primary Tasks &amp; critical performance areas</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Social &amp; economic deprivation of urban areas:</strong></td>
<td></td>
</tr>
<tr>
<td>. Provision of a safe &amp; reliable water supply.</td>
<td></td>
</tr>
<tr>
<td>. Provision of an effective sanitation system.</td>
<td></td>
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<tr>
<td><strong>Scarcity of productive land, and economic deprivation of rural communities:</strong></td>
<td></td>
</tr>
<tr>
<td>. Improve economic viability of marginal land by provision of a reliable water supply.</td>
<td></td>
</tr>
<tr>
<td>. Foster closer settlement by establishment of irrigation areas.</td>
<td></td>
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<tr>
<td>. Provision of government subsidies to foster economic growth.</td>
<td></td>
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<tr>
<td>. Provision of stock &amp; domestic water supply.</td>
<td></td>
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<tr>
<td>Construction of large regulating storages &amp; distribution networks.</td>
<td></td>
</tr>
<tr>
<td>Construction of collector &amp; outfall sewers and sewage farms or ocean outfalls.</td>
<td></td>
</tr>
<tr>
<td>Construction of large regulating storages &amp; distribution channels.</td>
<td></td>
</tr>
<tr>
<td>Clearing, grading &amp; reticulation of irrigation areas, settlement of farms, provision of water supply &amp; collection of charges.</td>
<td></td>
</tr>
<tr>
<td>Provision of free headworks and other services at a cost within capacity to pay.</td>
<td></td>
</tr>
<tr>
<td>Establish bore &amp; surface water supplies, regulating storages &amp; distribution networks.</td>
<td></td>
</tr>
</tbody>
</table>
Table 2.3 (b) Summary of implications of formative factors for the legitimation model: Criteria guiding implementation.

<table>
<thead>
<tr>
<th>Issues &amp; underlying Strategies for their resolution</th>
<th>Perceived Primary Tasks &amp; critical performance areas</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Hostility associated with the removal of water supply responsibility from local government authorities:</strong></td>
<td>Compliance with directives of the Board.</td>
</tr>
<tr>
<td><strong>.Representation of authorities on Boards.</strong></td>
<td>Technically, administratively &amp; financially competent in undertaking services.</td>
</tr>
<tr>
<td><strong>.Effectiveness in provision of services, and demonstrated technical, administrative &amp; financial competence.</strong></td>
<td>Effective provision of services on demand. Setting of charges based on principles of equity &amp; fairness.</td>
</tr>
<tr>
<td><strong>Relegation of powers of Parliament to enable effective implementation of works, free of political patronism:</strong></td>
<td>Effectiveness in provision of services. Limit activities to designated functions. Technically &amp; financially competent.</td>
</tr>
<tr>
<td><strong>.Delegation of administrative, technical and financial autonomy consistent with designated functions.</strong></td>
<td>Effective provision of services to enable economic growth.</td>
</tr>
<tr>
<td><strong>Expectation of provision of services by government:</strong></td>
<td>Provision of services based on principles of service upon demand, equity &amp; fairness. Respect individual rights except where relegation required in the general interest. Financially accountable, with income covering costs, except in case of rural water supply.</td>
</tr>
<tr>
<td><strong>.Allocation &amp; exploitation of natural resources by government as basis for material progress &amp; economic growth.</strong></td>
<td></td>
</tr>
</tbody>
</table>
Table 2.3 (c) Summary of implications of formative factors for the legitimation model: Criteria guiding implementation

<table>
<thead>
<tr>
<th>Issues &amp; underlying Strategies for their resolution</th>
<th>Percieveed Primary Tasks &amp; critical performance areas</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Isolation of rural settlement:</strong></td>
<td></td>
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<tr>
<td>. Dispersed nature of settlement and belief in closer settlement as means to rural growth &amp; prosperity.</td>
<td>Provision of irrigation development as basis of closer settlement.</td>
</tr>
<tr>
<td>. Inter-colonial rivalry &amp; associated expectation of matching administrative &amp; development initiatives in other states.</td>
<td>Monitor and match programmes in other states, and ensure protection of state resources (River Murray Agreement).</td>
</tr>
<tr>
<td>. Rural conservatism &amp; associated constraints on acceptable administrative instruments.</td>
<td>Emphasis on programmes involving direct provision of services rather than activities requiring collaboration of local communities</td>
</tr>
<tr>
<td><strong>Egalitarianism &amp; hostility to authority:</strong></td>
<td></td>
</tr>
<tr>
<td>. Special knowledge needs of society resolved by elevating the practical expert rather than the intellectual.</td>
<td>Programmes based directly on technical functions prescribed in statutes. Superior status of technical groups.</td>
</tr>
<tr>
<td>. Right of every Australian to a minimum standard of living.</td>
<td>Provision of services upon demand, guided by principles of fairness and equity.</td>
</tr>
<tr>
<td><strong>Local administration practice:</strong></td>
<td></td>
</tr>
<tr>
<td>. Expectation that enterprise financially viable, with exception of rural services.</td>
<td>Act commercially, with revenue sufficient to cover costs &amp; provide a reasonable rate of return.</td>
</tr>
<tr>
<td>. Administration based on association of consumers, with levying of charges based on property as most equitable &amp; practical. Effective implementation of irrigation based on compulsory payment for Water Rights.</td>
<td>Charges based on property values in case of metropolitan services. Charges based on Water Rights in case of rural water supply.</td>
</tr>
</tbody>
</table>
2.7 References

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3. ORGANISATION INPUTS

3.1 Introduction

The 'Legitimation model' hypothesised in Chapter 1 identified four 'input' components:

- formative factors;
- external support;
- external sources of legitimation;
- available resources.

The question of the role of formative factors in influencing organisation processes was discussed in Chapter 2. This Chapter analyses the operating environments of the seven authorities in terms of the 'Legitimation model' hypothesis components outlined above, for each of the periods of analysis identified in Chapter 1.

3.2 External support factors

3.2.1 Political support

(a) Theoretical framework

Political support available to the organisations will reflect:

- the credit accruing to the government as a result of the organisation's outputs (a function of the visibility of outputs in respect to such political goals as closer settlement, improved standards of living, economic growth, and national development);
- the extent to which organisation outputs are of interest to pressure groups having access to government (the distribution of votes across the electorate may further distort these demands);
- the perceived compliance of the organisation as an arm of government with expected standards of administration and technical competence, such that no discredit is brought upon the government.

The major social and political issues identified in Chapter 2 underlying the establishment of the water authorities, comprised:

- the provision of services as a means of alleviating urban and rural deprivation, and for providing a minimum standard of living;
- the promotion of closer settlement as a means of engendering rural growth and prosperity;
- the provision of infrastructure as a means of promoting economic growth and national development;
- the provision of irrigation and rural town water supply in response to the rural electorate and interest groups.
These issues are examined in relation to their 'political support accruing to the authorities' implications during the periods of analysis.

(b) The provision of services as a means of alleviating urban and rural deprivation and of providing a minimum standard of living

As noted in Sections 2.3.1 to 2.3.3, the authorities were established in response to the need to ameliorate the severe social and economic deprivation prevailing in the late nineteenth century and early twentieth century, and subsequently were required to expand infrastructure to servicedevelopment in the metropolitan areas.

Establishment period

During the establishment period, the achievements of water authorities in the provision of services was such that substantial improvement in public health and standards of amenity were achieved, thereby promoting support for the authorities in organisational terms, but diminishing the political justification for further expenditure in these areas in the longer term. Figure 2.4 (Infant mortality rates) indicates the substantial reduction in infant mortality rates largely as a result of improvements in sanitation and water supply.

The incidence of plague in Brisbane in 1901 and 1921 is an exception to these trends. The provision of services in Brisbane lagged well into the 1930s in the case of water supply, and into the 1970s in the case of sewerage.

A high level of water supply provision was quickly achieved in all capitals with the exception of Brisbane. (Refer to Figure 3.1: Provision of metropolitan water supply). These statistics do not reflect the stringent water supply restrictions applying in Sydney, Melbourne and Adelaide through much of the 1930s and 40s pending the completion of new storages.

Sydney and Melbourne experienced strong growth in the 1911–1931 period (refer to Figure 2.3), partly as a result of the focus on manufacturing growth in the post 1920 period.

In the case of sewerage (refer to Figure 3.2: Metropolitan provision of sewerage), all capitals lagged in the provision of services, with the exception of Melbourne. The severity of insanitary conditions prior to the establishment of the Melbourne Board ensured that a high priority was given to the provision of sewerage services in the case of Melbourne.
While the Queensland government used its control over loan funds to control Brisbane Council programmes, it still had to respond to metropolitan issues in order to retain office. Inadequate sewerage was an election issue in 1932, and led to government provision of substantial funds for sewerage over the period 1934 to 1939 (1). Bureaucratic politics continued to be a factor influencing the administration of services by the Brisbane Council (2). The imposition by the government of committees to review Council programmes, including the Co-Ordinator General's Department controls, severely constrained Council administration. Laverty notes that the government justified this interference on the basis of co-ordination of public works across the state. (3)

Urban water authorities were used to provide unemployment relief during the depression years. Major advances in the provision of sewerage occurred as a result of these programmes, particularly in Brisbane and Adelaide.

Expansion period

During the expansion period, primary focus continued to be on the implementation of new services. Urban authorities in Sydney, Melbourne and Adelaide were required to undertake the provision of services to a burgeoning urban population in the post-War years. Governments promoted a policy of the right of every Australian to their own home, including the provision of basic services. Growth was a function of the post-War baby boom, and programmes of immigration and industrial development sponsored by the State and Federal governments. Brisbane was less affected by immigration than the other capitals.

A considerable backlog in the provision of services developed during the period in all capitals. The Sydney Board sought to limit metropolitan development to those areas in which services were already established, as one means of limiting the problem. The Board faced increasing criticism as a result of the pollution of ocean beaches arising from increased quantities of sewage discharged.

The Melbourne Board entered the expansion period with considerable political support. A Royal Commission of Enquiry in 1941 recommended an extension of the Board's functions to include planning, roads and bridges, fire services, and public transport. The War intervened in the implementation of the recommendations. Responsibility for planning was conferred on the Board in 1954, and metropolitan highways and bridges in 1956. An application for extension of water supply catchments lodged by the Board in 1963 was refused by the government, and a Public Works Committee Enquiry was instigated to consider the matter (4).
The construction of Chowilla Dam on the Murray became a major political issue in SA in the late 1960s. Following the escalation in the estimated cost of the dam, and growing concerns regarding salinity aspects of the project, other parties to the River Murray Agreement withdrew their support for the project in 1967, and proposed the construction of a dam on the upper Murray instead. In attempting to ratify the amended agreement, the Hall LCL government was challenged, and subsequently lost the 1969 election.

The urban overspill in the Brisbane region further justified government intervention in Brisbane Council administration of services (5).

Re-politicisation period

In the Re-politicisation period, there was increased concern regarding deterioration in environmental quality, with gross pollution clearly visible, and loss in amenity experienced. The Sydney Board was required to augment and upgrade its sewerage treatment facilities to comply with new environmental legislation (Clean Waters Act 1970), while the Dunstan Labor government in SA gave priority to environmental protection programmes.

The Victorian government intervened in a number of Melbourne Board programmes in the 1970s in response to growing community concern regarding environmental deterioration. Responsibility for highways and bridges was removed from the Board in 1974 as a result of the Board's proposal to locate a Freeway along a parkland corridor (6, 7). In view of the increasing number of contentious issues involving the Board, the government appointed an Inquiry into the Melbourne Board in 1977, to consider whether the Board should be re-constituted, and to review its scope and functions. The Inquiry recommended that the Board of 54 Commissioners should be replaced by a Board of 6 part time Commissioners, plus a Chairman and Deputy Chairman appointed by the government. The changes were enacted in 1978. (8)

(c) The promotion of closer settlement as a means of engendering rural growth and prosperity

Sections 2.3.2 & 2.3.3 outlined the emergence of closer settlement as a major policy issue for governments.

Establishment period

Figure 3.3 (Rural population growth) indicates that with the exception of NSW and Queensland, rural population growth after 1901 was limited. Strong rural growth continued from 1901 up until 1931 in Queensland, and from
FIGURE 3.3 RURAL POPULATION GROWTH

FIGURE 3.4 VALUE & COMPOSITION OF ANNUAL PRODUCTION
1901 up until 1921 in NSW. The growth in NSW rural areas reflected growth in major industrial centres rather than growth in the rural areas. The urban-rural dichotomy was a significant electoral issue in all states. Its significance was further promoted by the extent of disproportionate distribution of votes in the rural electorate's favour which emerged within the states over the period 1910 to the late 1950s (refer to Table 2.2).

Victorian governments identified closely with the small landholder and selector. Consequently, closer settlement became an article of faith in that state. Rutherford observed that the Victorian government had pursued a clear policy of encouragement of intensive irrigation as a means of enhancing population growth and resource development of the state. (9) Mead considered that state promotion of irrigated land had gone far enough by 1916, but governments continued to promote closer settlement into the late 1920s. (10)

Parker notes that 'as the mother colony, NSW has demonstrated a greater maturity and stronger control role than was evident in other states'. Hence, NSW governments were more resistant to demands of the small landholders. (11)

The first World War engendered an 'Empire spirit', which in turn provided a strong impetus for rural settlement in the 1918 to 1928 period. This growth was further enhanced by programmes of Soldier Settlement (12).

South Australia's Chartist origins and yeomanry tradition limited the squatter alienation of land, and yielded an expectation of self-sufficiency on the part of landholders.

The vast areas of well watered land in Queensland meant that pressures on land were less acute than in the other states. These factors are illustrated in Figure 2.5 (Settlement as a percentage of viable land).

Expansion period

The commitment to the principle of closer settlement continue in the early part of the period, as governments supported the development of irrigation by rural water authorities as an important instrument for the implementation of this policy. Irrigation development received further support as a means of creating farms for Soldier Settlement following the Second World War. Finally, the continued urban-rural dichotomy and disproportionate distribution of votes ensured ongoing political support for investment in irrigation.

Only two further closer settlement schemes were undertaken in Victoria during the period, each associated with Soldier
Settlement. Rural water authorities in all states were given additional responsibility for implementing farm modernisation programmes during the period.

Re-politicisation period

The re-politicisation period saw some redress of the rural gerrymander, a decline in the influence of the Country Party in Victoria, NSW and South Australia, and a substantial shift in government policies from a 'development' orientation to a 'quality of life' orientation.

There was a decline in support for investment in irrigation development in the re-politicisation period, in view of questionable economics of irrigation. Nevertheless, investment in large water supply storage developments continued well into the period.

(d) The provision of infrastructure as a means of promoting economic growth and national development.

Section 2.3.3 outlined the emergence of the belief in the role of closer settlement as a means of engendering rural growth and prosperity. At the time of the establishment of the water authorities, there had been a long government involvement in the provision of infrastructure associated with facilitating growth in the economy. Section 2.5.4 explored the concept of promotion of economic growth as a major role of government.

Establishment period

The promotion of economic growth and commerce in the establishment period was based on the provision of infrastructure and land, and the establishment of protective tariffs. Figure 3.4 (Value & composition of annual production) indicates the continued dominance of rural production up until the 1950s, and the emergence of manufacturing and mining as the dominant sources of production thereafter.

The Playford Government in SA adopted in the late 1930s a policy of direct promotion of the State as a centre for manufacturing. The provision by government of cheap water supply, drainage and power were used as a basis for the attraction of manufacturing industry.

Expansion period

National development became a universal policy in the post-War years as a means of securing social progress. While the principal means of securing this progress was industrialisation, power generation and transportation, the
rural gerrymander and lobbying of rural interest groups ensured that government investment was sustained in rural areas.

In 1960, Mr Jack Beale (an engineer) was appointed as the Minister for Conservation in the NSW Liberal-Country Party governments of 1960 to 1970. The Minister expounded an ambitious water conservation development programme for NSW, which led to a prodigious dam construction programme in the mid-1960s to late 1970s, at a time when investment in irrigation was generally waning.

The Playford LCL governments in SA continued a major programme of industrialisation in the post-War years, with government providing direct support to the private sector in the provision of associated infrastructure.

The Queensland IWSC was established in 1946, as a means of ensuring greater attention to the development of water resources in the state. (13) Primary industry continued to provide the basis of economic growth throughout the period. Unlike other states, Queensland did not experience major post-War immigration and industrialisation.

The Australian Water Resource Council was established in 1963 as a means of co-ordinating assessment of water resources nationally.

Campbell noted that by 1965, further expenditure in irrigation was considered not as socially desirable as other forms of investment, in view of changes in the structure of the economy. (14) The major growth in the period was in the manufacturing sector, while growth in the primary industry sector was largely dependant on improved techniques of production. (15)

Re-politicisation period

There was a decline in public investment in national development in the re-politicisation period, due to growing concern regarding environmental impacts (externalities) and world-wide recession, and a shift to a focus on quality of life aspects. Queensland alone continued to reflect a development ethos. Campbell notes that a marked increase in expenditure on irrigation storages occurred in Queensland from 1968, with the development of storages well in advance of any established demand for water supply (16, 17).
(e) The provision of irrigation and rural water supply in response to the rural electorate and interest groups

Section 2.5.3 outlined the emergence of the urban-rural dichotomy and the requirement for governments to give a high priority to rural development programmes.

Establishment period

The urban-rural dichotomy and the disproportionate distribution of voting across the electorates prevailed in all states throughout the period.

From 1922, in a major programme of agrarian legislation, Labor governments pursued a 'New Deal for Farmers' with the provision of access, water supply, and irrigated land.

The Victorian Country Party was essentially a 'small farmers' based political party. Rutherford notes that many farmers objected strongly to the compulsory payment of water rates. Under political pressure, the government deliberately under-valued the properties in order to reduce the charges for water (18).

Eggleston notes that the state incurred a deficit in respect to irrigation in this period. He claims that but for political interference, irrigation could have become self-supporting, the chief obstacle being the political influence of the irrigation settlers in the numerous electorates. (19) Following the Royal Commission Enquiry of 1936, a further $52,000,000 of liability was transferred to the 'national' account. (20)

Within NSW, the Country Party was largely a graziers and 'big farmers' organisation (21). While the NSW Country Party has not played a significant role in the promotion of irrigation, the conservation of water resources has been an important component of its platform. Mention has been made previously of the strong government control of statutory authorities exercised in NSW.

The New State Movement pressed for the succession of the Riverina, placing pressure on the NSW Government to invest in water development within the Riverina.

Expansion period

Disproportionate electoral distribution and strong Country Party influence in all of the conservative governments continued throughout much of the period. Programmes of farm modernisation were implemented in Victoria and a 'New Farm' programme was initiated in Queensland.

The 'urban farmers' (largely Soldier settlers) on irrigation blocks emerged as articulate pressure groups,
defending rights and demanding further irrigation investment.

The Playford LCL governments in SA continued to promote industrialisation and the protection of rural interests well into the expansion period. The investment criterion of a fair return on investment was displaced by the criterion of direct and indirect benefits to be greater than the investment.

The Snowy Mountains Scheme raised a number of conflicts between the rural water authorities. The rural water authorities considered that power generation should be secondary to irrigation (22); while Victoria and NSW disagreed over the 'Murray' versus the 'Murrumbidgee' diversion options, each distrustful of the others' intentions with respect to allocation of water.

Re-politicisation period

There was a shift to a focus on urban plight in the re-politicisation period, as a result of redress of rural gerrymander and decline in the influence of the Country Party as a sectional interest party. The impact of large public works projects on the environment came under increasing scrutiny of an informed and articulate environmental lobby group.

As noted previously, by 1965, in view of the changes in the structure of the economy, further expenditure in the extension of irrigation could no longer be justified economically. (23)

(f) Visibility of works and services

Works which had a high visibility such as large dams or canals were perceived as the visible evidence of Government commitment to the electorate, and were commonly promoted irrespective of their economic viability. A ranking of the visibility of works is outlined in Table 3.1.
Table 3.1 Ranking of visibility of works

<table>
<thead>
<tr>
<th>Activity</th>
<th>Ranking</th>
<th>Modifying Factors</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Design &amp; construction tasks related to:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dams</td>
<td>High</td>
<td>Size, location with respect to population centres.</td>
</tr>
<tr>
<td>Canals</td>
<td>High</td>
<td>Size</td>
</tr>
<tr>
<td>Treatment plants</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Water supply</td>
<td>High</td>
<td>Size, technology, location with respect to population centres.</td>
</tr>
<tr>
<td>Sewerage</td>
<td>Interm. to low</td>
<td>Size, technology, location with respect to population centres.</td>
</tr>
<tr>
<td>In-ground structures</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tunnels</td>
<td>Interm.</td>
<td>Size, technology</td>
</tr>
<tr>
<td>Pipes</td>
<td>Low</td>
<td></td>
</tr>
<tr>
<td>Pump stns</td>
<td>Low</td>
<td></td>
</tr>
<tr>
<td><strong>Operation &amp; maintenance tasks related to:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Parks, gardens, recreation areas.</td>
<td>Interm.</td>
<td>Area, quality, location with respect to population centres.</td>
</tr>
<tr>
<td>Treatment plants</td>
<td>Interm.</td>
<td>Size, technology, location with respect to population centres.</td>
</tr>
<tr>
<td>Dams, canals, tunnels &amp; pipes</td>
<td>Low</td>
<td></td>
</tr>
<tr>
<td><strong>Administrative tasks related to:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Assessing &amp; receiving</td>
<td>Low</td>
<td></td>
</tr>
<tr>
<td>Auditing</td>
<td>Low</td>
<td></td>
</tr>
<tr>
<td>Policy &amp; performance monitoring</td>
<td>Low</td>
<td></td>
</tr>
</tbody>
</table>
(g) Compliance of organisations as arms of government with expected standards of behaviour and performance.

Sections 2.5.4, 2.5.6 & 2.5.7 outlined community expectations regarding the provision of services, and the manner of their implementation, which prevailed at the time of the establishment of authorities. Sections 2.4.1 & 2.4.2 outlined the administrative implications for the authorities of the removal of responsibility from local government, and the relegation of the powers of parliament.

Establishment period

The relegation of parliamentary powers to the authorities led to close scrutiny of authority administration by way of Parliamentary Enquiries and Royal Commissions, particularly in the cases of South Australia and Queensland. Consequently, all authorities had to pay careful attention to restricting their activities to those covered in their statutes, and to the provision of services and the setting of charges without favour. Not until the agricultural boom of the 1930s alleviated the scarcity of public funds in SA did public scrutiny of Government undertakings in that State ease off.

In the case of the Brisbane City Council, government bureaucracy, hostility and suspicion of the Council led to a number of enquiries into its undertakings. Similarly, the hostility of local government authorities towards the Sydney Board led to continual accusations of incompetence and to a number of enquiries.

Expansion period

There was a marked absence of government enquiries into water authority administration during the period, as governments sought the close collaboration of the authorities in the implementation of major development programmes.

Re-politicisation period

There were a number of administrative enquiries in the period, in SA, NSW, Victoria and at Federal level, leading to the introduction of new water legislation in all states, and to new co-ordination arrangements in respect to the management of natural resources. The Sydney and Melbourne Boards were made accountable to Ministers during the re-politicisation period.

Environmental legislation and co-ordination machinery was introduced in NSW and Victoria, while water resource development and administration was consolidated in the one Department in SA. In view of the importance of public works in Queensland, it had always been given a high degree of
development co-ordination in the Co-Ordinator General's Department (24).

In summary, administrative reviews were directed by strong governments in NSW and SA, while consensus and co-operative bureaucratic politics prevailed in Victoria, and the development ethos continued in Queensland.

(h) Summary

The level of political support available to the authorities was largely a reflection of the role of the authorities in respect to alleviation of major socio-economic problems of the time, and provision of services to major interest groups.

The early success of most authorities in alleviating social and economic deprivation, and the visibility of works in rural areas, engendered strong support for the authorities, notwithstanding close parliamentary scrutiny during the establishment period. The expansion period was marked by close collaboration between the authorities and governments in the promotion and servicing of economic growth.

The urban-rural dichotomy, the rural gerrymander, and the influence of the Country Party were all significant factors supporting continued investment in rural water supply during the period 1930 to 1970.

Significant changes occurred in political perspectives and priorities in the early 1970s, with a shift away from development to a quality of life goal, substantial reduction in sensitivity to the rural electorate, and a concern to improve government administration in areas impacting on the environment and quality of life. These shifts introduced a number of conflicts between the priorities of the authorities and those of the community and governments. Governments moved to regulate authority programmes and powers.
3.2.2 Client support

(a) Theoretical framework

In the case of urban authorities, clients comprise the ratepayers and the local government authorities.
In the case of the rural organisations, clients comprise the irrigators and ratepayers within the stock and domestic and rural town water supply districts.

Client support will be a function of:
- the level of provision (type, standard and reliability) of the services in response to demand;
- the affordability of services and equitable allocation of charges;
- the perceived technical and administrative competence of the organisation demonstrated in undertaking its functions;
- the perceived use of powers strictly in accordance with the statutory powers, and in accordance with the principles of equity, fairness and the general interest.

Lipset notes that sustained legitimacy is dependent on:
- the maintenance of effectiveness;
- the access of interest groups to political power;
- the compliance of the authority with societal norms of behaviour (25).

(b) Analysis of authorities

Sections 2.3, 2.4 and 2.5 outlined community expectations regarding the implementation and administration of services which prevailed at the time of establishment.

Establishment Period

The metropolitan water authorities made substantial progress in the implementation of services and in the reduction of disease in the period. Nevertheless, the Sydney Board faced considerable antagonism from local government authorities. Modifications were made to the Board representation in 1924 to placate these pressures, with an increase in representation of local government authorities on the Board from 5 to 16 members. Following a Royal Commission of Inquiry into the Board's water supply works in 1933, a Reconstitution Bill 1935 returned the Board to a total membership of 7, of whom 2 were appointed by the government and 5 were nominated by local government.

The Sydney Board received numerous complaints as early as the 1920s regarding odours and scums occurring on Sydney beaches, as a result of the ocean discharge of sewage.
The Melbourne Board on the other hand, avoided confrontation with local government authorities as a result of extensive local government representation on the Board, and in view of a limited involvement of local government in water supply and sewerage prior to the establishment of the Board. The Board initially comprised a Chairman appointed by the government, and 39 Commissioners nominated by local government authorities within the metropolitan area.

Eggleston considered that the Board's constitution had been peculiarly successful. In his view, the Board had handled services committed to it efficiently. This success was attributable to a strong chairman, a limited scope of services, and the absence of government control. (26)

In the case of the EWSD's provision of services for Adelaide, there was an increasing incidence of complaints regarding poor water quality after 1937. By the late 1930s, sewage odours had emerged as a major area of public complaint. (27, 28)

Difficulties incurred in the construction of the Brisbane sewerage system led to continued delays in improvement in sanitation and challenges to the standards incorporated into the sewerage scheme.

The SRWSC was initially unable to attract farmers to take up its serviced irrigation blocks. The Commission undertook an immigration promotion drive in Europe and the USA to attract settlers. Ultimately, Empire and Soldier Settlement provided a means of attracting settlers. Rutherford notes that many farmers objected strongly to the compulsory payment of water rates, and that under political pressure, the government under-assessed the value of blocks as a means of reducing the water rights charge. (29)

The initial settlement in the Murrumbidgee Irrigation Area (MIA) commenced in 1912, but as in the case of the SRWSC, major settlement occurred in the early 1920s as a result of Soldier Settlement programmes. (30)

The WCIC experienced extreme hostility in the early administration of the MIA. This was the result of a number of factors, including too small a block size, failure of markets, ignorance in location of farms, and ignorance of irrigation culture techniques. These conflicts were the subject of two Royal Commissions of Inquiry (1915 & 1925). (31)

The Soldier Settlers or 'urban farmers' proved to be a vocal and articulate pressure group, bringing considerable pressure to bear on governments over subsequent years. In the case of the MIA, there was a long period of irrigators-WCIC antagonism, during which considerable modification to policies and water charges occurred to accommodate the irrigators. A considerable degree of local
co-optation was evident, as a result of decentralisation of administration of irrigation areas, and staff drawn from the irrigation areas.

The action of government in subsidising headworks, reducing charges and absorbing debts reinforced the perception of the government role as one of subsidisation of works and water supply as a basis of rural development.

Expansion period

The success of the urban authorities in the pre-War years in alleviating social deprivation engendered considerable support for the authorities in the expansion period. This support is reflected in the increased geographic and functional jurisdiction given to the urban authorities during the period, and in the use of the authorities by governments as instruments for national development.

The primary focus during the period was one of augmentation of water supply storages and the extension of water supply reticulation in an attempt to keep pace with burgeoning metropolitan growth and government policy on home ownership.

Irrigation blocks were used to accommodate 30% of Soldier Settlement in the post-War period. This 'second wave' of settlers brought with them a strong mateship and leadership system. Articulate and vocal irrigation farmers used their electoral advantage to promote further investment in rural water supply, and the retention of the considerable subsidies secured in the previous period. (32)

Re-politicisation period

Traditionally, the relegation of individual rights was based on the concept of provision of services of a general community interest. In the 1970s, there was growing dissatisfaction with the deterioration in environmental quality and exclusion from the policy making process. The pluralism of the 1970s challenged the single objective premise of 'utilitarian' based administration. The impact of public works on the environment in particular came into sharp public focus.

Serious backlogs in the provision of services had emerged in the late 1960s and led to serious degradation of environmental quality. Growing concerns regarding deterioration in the quality of urban life as a result of pollution of streams and beaches by sewage, congestion of traffic, and the scale of construction programmes pursued by the authorities, led to a questioning of the development ethos and challenge to authority programmes. The authorities in many cases were slow to respond to these social and political changes in their operating environment
and consequently faced increasing client opposition.

Governments were generally slow to review and amend the authority statutes, preferring to erect environmental regulatory structures and procedures for the control of authority programmes.

The Sydney Board came under intensive criticism for the continued deterioration of the quality of ocean beaches and inland rivers. The Melbourne Board had its responsibility for highways removed by government as a result of its proposal to locate a major freeway in parkland, and the government intervened in technical decisions on the discharge of sewage effluent from the South Eastern Sewage Treatment Plant.

In the case of the Water Resources Commission of NSW and the EWSD, the governments incorporated provision in the statutes for the establishment of advisory committees comprised of user groups.

(c) Summary

Water authorities achieved a high degree of client support throughout much of the establishment and expansion periods as a result of their success in substantial alleviation of social and economic deprivation. By the late 1960s however, there was disenchantment as a result of the extent of environmental degradation directly attributable to authority programmes, and backlogs in the provision of services. Except for minor conflicts between irrigation water supply and flood protection measures, rural communities appeared to relate closely to the rural authorities.

Generally, the administration of the water authorities has been notable for its lack of client involvement in the formulation of policies, charges and development programmes. Where advisory committees or Boards have been established, their role has been more one of facilitating the setting and collection of charges, rather than one of administration of services.

There has been a lack of surveys of consumer attitudes, with authorities adopting consumer complaints as the criterion for client satisfaction. While authorities have had to frequently resort to restrictions on the provision of services during periods of drought, there appeared to be reluctant acceptance of restrictions by clients on the basis that the situation was beyond the control of the authority.

Considerable co-operation occurred within the rural water authorities in the establishment and expansion periods in
the irrigation areas.

3.2.3 Professional support

(a) Theoretical framework

Professional support will be a function of:
- the accordance of works with the best professional practice of the day;
- the relationship between the authority (or its principal officers) and professional associations.

(b) Analysis of authorities

Establishment period

Initially, government enquiries sought expert opinions from overseas consultants. The establishment and early administration of the authorities is notable for names such as Mansergh, Mead, Clarke, and Mais. With time, engineering practice evolved approaches and techniques more appropriate to local conditions, and confidence grew in the indigenous professionals. Enquiries subsequently drew on experts within related organisations in other states.

The Institution of Engineers Australia was established in 1919. While it provided a basis for the professional autonomy of engineers, the Institution has not been a major force in public inquiries. (refer to Table 3.2: Membership of the Institution of Engineers Australia)

<table>
<thead>
<tr>
<th>Year</th>
<th>Members</th>
<th>Year</th>
<th>Members</th>
</tr>
</thead>
<tbody>
<tr>
<td>1921</td>
<td>2,074</td>
<td>1961</td>
<td>14,414</td>
</tr>
<tr>
<td>1931</td>
<td>3,392</td>
<td>1971</td>
<td>25,375</td>
</tr>
<tr>
<td>1941</td>
<td>4,523</td>
<td>1980</td>
<td>33,823</td>
</tr>
<tr>
<td>1951</td>
<td>8,308</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: Institution of Engineers Australia

Expansion period

A feature of the Australian engineering profession up until the 1970s has been the dominance of government authorities as the major employers of engineers.

The establishment of the Snowy Mountains Scheme provided an opportunity for engineers to demonstrate their technical capabilities, as well as a major construction model for state authorities to emulate.
The Snowy Mountains Scheme also presented a challenge to the power of rural water authorities, in that the proposed scheme was seen to focus on power generation and not on regulation and diversion of irrigation water supply. In addition, NSW had a historic attachment to the concept of a Snowy diversion, with a proposal to divert the River to the Murrumbidgee River. (33) This would have meant a considerable sacrifice in power generation capability, and a loss of Snowy water to the Murray River (Victorian irrigators), and was vigourously opposed by the SRWSC. Ultimately, the Commonwealth had to invoke its Defence powers to take charge of the development.

There was also growth of Watershed Associations in the post-War period, drawing on the experience of the Tennessee Valley Authority in the USA. The Association comprised irrigators, rural water authorities and natural resource users who viewed the watershed or catchment as an appropriate administrative unit for the purpose of resource and national development.

The Australian Water Resources Council was formed in 1963, to co-ordinate stream gauging and assessment of water resources on a national basis. There has been substantial growth in the Council's functions over the years, to include the determination of water quality criteria, promotion of research into catchment management, floodplain management, and water and wastewater treatment practice.

Re-politicisation period

Campbell noted that by 1965, further investment in the extension of irrigation was no longer socially desirable, in view of changes in the structure of the economy. However, a number of social and institutional obstacles inhibited the objective evaluation of irrigation development programmes (34).

The National Water Policy was formulated in the period 1973 to 78 under the auspices of the AWRC. The Policy embraced a major focus on planning in response to broad social, economic and environmental goals. Adaptation to the new environmental concerns proved to be difficult for a number of the authorities, as illustrated by the WRC of NSW publication of a spirited defence of its dam building policy as late as 1979. (35)

(c) Summary

Overt professional lobbying has not been a feature of the authorities under analysis. However, professional groups within the organisations have utilised colleagues in
outside authorities to substantiate their claims.

The limited role of the Institution of Engineers Australia may be a reflection of the domination of government authorities as the major employers of engineers up until the 1970s, or the conservative nature of the Institution. Many of the innovative developments in water authority management and technology have occurred outside the auspices of the Institution in recent years.
3.3 External sources of legitimation

3.3.1 The role of government

(a) Theoretical framework

The legal and administrative authority delegated to public organisations will be constrained in the first instance by prevailing norms regarding the role of government.

Section 2.5.4 outlined the perspectives on the role of government prevailing at the time of establishment of the authorities. In summary, the role of Government in the provision of services was perceived as legitimate where:

- collective action was required in order to secure the general utility;
- action was required in order to correct a weakness in the market, as in the case of monopolies;
- action was required to provide a non-marketable service in the general interest;
- direct government provision of infrastructure was required in the case of under-developed economies, to initiate self sustaining economic growth.

As noted previously, in the case of Australia, the egalitarian sentiment and the circumstances of settlement supported the instrumental theme of the state as a vast public utility in the service of the individual. This view was consolidated in the early-1900s in terms of the right of every Australian to a minimum standard of living.

(b) Analysis of authorities

Establishment period

The establishment of authorities occurred under conditions of urgent need for the provision of services. Consequently, the role of government was clearly one of provision of water supply, sanitation and drainage services in the interests of community well being.

During the 1920s, the central objective of government appears to have been the support of population growth and the twin objectives of urban manufacturing and farm expansion. (36)

Sydney and Melbourne experienced substantial growth over the period (refer to Figure 2.3: Metropolitan population growth), necessitating extension of services to new households. Economic recession severely constrained population growth in the 1890s and 1930s. Governments utilised the urban authorities during the 1930 to 1937 recession to provide unemployment relief.
In the mid-1930s, the SA Liberal Country League (LCL) governments sought to diversify the state's economy, by means of promotion of manufacturing industry and immigration. The government used direct provision of water supply, drainage and power as the basis of attracting manufacturing industry to SA. In 1937, the government undertook to provide water supply to Whyalla, and to establish the Leigh's Creek coal mine in 1938, as a means of attracting investment by BHP (37). The government established the SA Housing Trust in 1940 as a further expression of state intervention in the direct provision of social and economic infrastructure (38). It was an act of paternalistic socialism justified on the basis of the wider interests of the state (39).

The establishment of the Co-ordinator General's Department by the Queensland government in 1938 was an attempt by government to direct the economic exploitation of the state's resources more effectively. In the 1930s and 40s, the Queensland government justified interference in Brisbane City Council programmes on the basis of the need for co-ordination of public works across the state (40). The Co-ordinator General's Department was established with responsibility for co-ordination of all state public works.

The Victorian government's pursuit of the closer settlement goal was based on the belief that growth in the rural population would act as the lynch pin for greater rural production and state prosperity. NSW's entry into irrigation appears to have been a response to the need to justify NSW's claims to River Murray water in the face of aggressive irrigation development by Victoria, and to placate 'New State' agitation in the Riverina.

Expansion period

The post-second World War period was one of new national confidence, with major focus on 'national development' as the means of securing social progress. The Snowy Mountains Scheme was symbolic of this new national self-assurance. The Victorian and NSW governments promoted industrial growth by investment in energy and transport infrastructure. Water conservation became a major feature of NSW government programmes, while the Playford SA governments continued a policy of industrialisation, including immigration of skilled labour and state provision of power, transport, housing and water supply.

Generally, the consensual conservatism prevailing throughout the period comprised:

- the role of the state is to assist private enterprise, particularly in those areas where capital is unlikely to be attracted without such
assistance;
.the view that Australia should remain essentially a
capitalist country, though not laissez-faire in the
nineteenth century sense;
.the major administrative concern was the structure
of the economy;
.the state should assist national development so as to
maximise public welfare through private
enterprise. (41)

Rapid growth occurred in the Sydney, Melbourne and Adelaide
metropolitan areas in the post-War period, as a result of
the post-War baby-boom, industrialisation and immigration.
Brisbane did not share in the post-War immigration to the
same extent as the other capitals.

Government policies of promotion of home ownership,
national development, immigration and manufacturing
reinforced the expectation of provision of basic services
by government.

As governments utilised the authorities to implement their
policies, the parliamentary scrutiny of the authorities was
institutionalised in the form of Parliamentary Public Works
Committees.

Re-politicisation period

In view of the rising community concern regarding the level
of environmental degradation, all governments moved during
the 1970s to enact environmental controls and to establish
authorities to implement the controls.

The late 1970s was a period of administrative review, as
governments experienced increasing difficulty in responding
to a changing electorate and in co-ordinating a complex
range of service functions. The inquiries included:

.Royal Commission on Australian Government
Administration (Coombs Inquiry), 1974-76;
.Board of Inquiry into the Victorian Public Service
(Bland Inquiry) 1972-75;
.NSW Machinery of Government Review, 1974-76;
.Committee of Inquiry into the South Australian
Public Service (Corbett Inquiry), 1973-76.

The NSW Machinery of Government Review found that the
existing administrative structure was a reflection of some
110 years of adhocracy, unregulated and powerful statutory
authorities, and of the failure of Cabinet to provide
direction on public policy (42). Cabinet was restructured
on the basis of five standing committees, with authorities
touching on water resource matters encompassed by the
Industrial Resources Committee. (43)

A dispute between the Melbourne Board and SRWSC over the
allocation of the Big River catchment led to the establishment by the government of the Land Utilisation Advisory Council to advise on resource allocation across the state, and the Hamer Liberal government established an elaborate planning hierarchy based on the Premier's Office, rather than attempting to restructure the administration.

The SA Committee of Inquiry recommended regrouping of functions with a view to establishing fewer and stronger Departments (44). The Inquiry considered that the EWSD had responsibilities vital to the state's future, and as such, should be retained as a separate Department.

In the late 1960s, the Queensland Co-ordinator General's Department began to divest itself of purely construction activities, and to shift to consideration of broader policy issues. (45)

Consequently, all governments were involved in undertaking a stronger co-ordination and planning role in the re-politicisation period.

(c) Summary

The egalitarian sentiment and the circumstances of settlement supported the instrumental theme of the state as a vast public utility in the service of the individual. This position consolidated in the early 1900s in terms of the right of every Australian to a minimum standard of living.

The expectation of government provision of infrastructure in under-developed countries to initiate self-sustained economic growth underlay the belief in 'closer settlement' as a means of improved social and economic conditions in rural areas. The same premise enabled governments to adopt programmes of 'national development' in the post-War years as a means of improving economic conditions. As all natural resources were owned by the Crown, only governments were capable of allocating resources and undertaking resource development.

Provision of infrastructure in the urban areas was an extension of utilitarianism and municipal socialism.

Co-ordination of capital works programmes was embraced as an important role of government throughout the expansion and re-politicisation periods. Governments intervened in the re-politicisation period in an attempt to limit environmental degradation.
3.3.2 Administrative practice

(a) Theoretical framework

Section 2.5.7 outlined the perspectives on administrative practice prevailing at the time of establishment of the authorities. In summary, the expected standards of comprised:

- the adoption of an association of consumers, governed by elected officials, as the administrative means of setting and collecting charges, and as the basis of local autonomy;
- the provision of services upon demand;
- the adoption of commercially based management, with revenue sufficient to cover costs;
- the provision of an annual audit and the publication of annual accounts;
- the allocation of services and setting of charges in an equitable manner, with dispensation for the poor;
- the compliance with the law;
- the maintenance of a nexus between charges for services and the level of services provided;
- the provision of services in a technically efficient and expert manner;
- the delegation of administration to a corps of trained officers, supervised by elected officials;
- the use of standing committees of elected officials to manage the various departments, frame by-laws, examine records and set rates.

(b) Analysis of authorities

As noted in Section 2.5.6, Victoria pioneered the system of confining ministerial writ to general matters of policy, in an attempt to reconcile democratic control with a degree of real autonomy for public corporations. This approach yielded satisfactory financial results through to 1914, reflecting the application of sound financial criteria. In the inter-War years however, price concessions and subsidies proliferated in response to rural pressure groups. (46)

All authorities attempted to generate sufficient revenue to recover the costs of provision of services. However, in view of the lumpy nature of water supply and sewerage capital works, it was necessary to fund a substantial component of the works by loans. Until recently, the value of assets was based on historic costing. Hence, as a result of inflation, the interest and amortization paid on the assets fell far short of their replacement value.

The rural water authorities were an exception to this principle, where governments intervened in terms of either subsidised works or services, or by limiting charges.
Governments justified the provision of 'free' headworks on the basis of initiating self-sustaining economic growth in the rural areas. This policy was modified in the 1960s, with the adoption of the principle that indirect benefits should cover the direct costs. (47)

Statutes required the maintenance of separate accounts for water supply, sewerage and drainage, such that the assessment of rates reflected the separate costs, in keeping with the principle of maintaining a nexus between the level of service demanded and the charges levied. In the case of rural water supply however, charges were frequently subsidised, with generally recovery of the recurrent costs only. In the case of the Boards, the separate accounts provided the basis for structuring the standing committees and technical divisions within the organisations.

All authorities adopted simple rating structures, with rates set to recover costs rather than to maximise the return on investment. Not until the 1970s was consideration given to using the service rates to manage demand. Criticism of the failure to set rates at the marginal cost by economists in the late 1960s and early 1970s was refuted by authorities on the basis of the need for simple and equitable tariff structures. The adoption of fixed charges ensured a reliable income for the authorities, irrespective of the nature of the season experienced.

Administration was generally based on declared water supply, sewerage, drainage, river improvement or flood control Districts (an association of consumers), for the purpose of recovering network costs. This was the basis of administration of specific services by the EWSD, statutory corporations, water Boards and the Brisbane City Council.

In the case of the irrigation authorities, initial administration (the Victorian Trusts and the MIA) was based on local autonomous regions. As the supply of irrigation water increasingly involved harvesting and transfer from remote regions, the planning, development and administration became increasingly centralised, with local controls limited to reticulation and measurement of water supply, and receipt of payments.

Not until the administrative reforms of the 1970s were the statutory authorities required to formally constitute advisory committees of clients.

All the authorities maintained separate technical and administrative areas, with the technical areas responsible to an Engineer-in-Chief, and the administrative areas responsible to the Secretary, in line with the structures which emerged from the Special Purpose Authorities (refer to Figure 3.5). Not until the 1970s was this structure
varied by a water authority (EWSD). Considerable emphasis was placed on the technical competence of the authorities.

The requirement for all work to be undertaken by public tender was varied where work was undertaken by internal day labour groups.

FIGURE 3.5 TYPICAL ORGANISATION STRUCTURE OF COMMISSIONS AND BOARDS

(c) Summary

The development of infrastructure was based upon service upon demand up until the late 1970s. In view of the lumpy nature of capital works, a substantial component of funding was based on borrowing. Urban water authorities sought sufficient revenue to cover costs, while rural water authorities substantially subsidised works as a result of government intervention. This practice was justified during the establishment and expansion periods on the basis that the works would ultimately generate self-sustained economic growth, and through the re-politicisation period on the basis that indirect benefits would cover costs.

While service areas were based on associations of consumers, comprising water supply, sewerage, flood control, drainage, or river improvement Districts, administration up until the re-politicisation period was highly centralised.
3.4 Availability of resources

3.4.1 Physical resources

(a) Resource outline

The physical resources available to an organisation are an important determinant of policies, programmes and issues. Such factors as jurisdiction over and the location of water resources with respect to centres of demand, and the variability of flow, are the primary determinants of the viable administrative instruments and management strategies available to water authorities.

Similarly, the assimilative capacity of receiving waters to take up, dilute and break down pollutants will be a function of the characteristics of the receiving water (volume, reliability of flow), and the nature and quantity of the waste discharge.

Australia's water resources are limited and unevenly distributed. In addition, water availability is in general highly variable. Rainfall is most regular along the coastal fringes. Elsewhere, rainfall is more seasonally variable, with periodic extended dry periods a feature of inland areas. Evaporation is high throughout most of Australia, consuming 87% of all moisture that reaches the ground. High evaporation, coupled with the variability of streamflow, makes conservation and development of surface water resources more expensive and less effective than in many other countries. Australia is fortunate in having extensive groundwater resources. Major sedimentary basins underly some 60% of the continent, of which the Great Artesian Basin is the largest in the world. Groundwater from this source has sustained much of Australia's inland pastoral industry since the late nineteenth century. (48)

As all water and land resources were vested in the Crown from an early date, governments had power to determine the allocation of water supply catchments. In most cases, the establishment of the water authorities was the result of the need to undertake major works in catchments remote from the service area. Consequently, the major focus was on jurisdiction over catchments required to yield a reliable supply for some time into the future.

The severity of droughts during the period of analysis was such that few authorities escaped the need to impose water supply restrictions. The major periods of depressed streamflow are summarised in Table 3.4.
Table 3.3 Periods of depressed streamflow affecting Eastern Australia

<table>
<thead>
<tr>
<th>Drought period</th>
<th>Affected Areas</th>
<th>NSW</th>
<th>Vict</th>
<th>SA</th>
<th>Qld</th>
</tr>
</thead>
<tbody>
<tr>
<td>1896 - 1904</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>*</td>
</tr>
<tr>
<td>1904 - 1910</td>
<td>*</td>
<td></td>
<td>*</td>
<td>*</td>
<td>*</td>
</tr>
<tr>
<td>1913 - 1916</td>
<td>*</td>
<td></td>
<td>*</td>
<td>*</td>
<td>*</td>
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<tr>
<td>1925 - 1928</td>
<td>*</td>
<td></td>
<td>*</td>
<td>*</td>
<td>*</td>
</tr>
<tr>
<td>1934 - 1942</td>
<td>*</td>
<td></td>
<td>*</td>
<td>*</td>
<td>*</td>
</tr>
<tr>
<td>1943 - 1947</td>
<td>*</td>
<td></td>
<td>*</td>
<td>*</td>
<td>*</td>
</tr>
<tr>
<td>1951 - 1954</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>*</td>
</tr>
<tr>
<td>1957 - 1959</td>
<td></td>
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<td>*</td>
</tr>
<tr>
<td>1964 - 1966</td>
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<td>*</td>
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<tr>
<td>1965 - 1968</td>
<td></td>
<td>*</td>
<td>*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1972</td>
<td></td>
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<tr>
<td>1977 - 1978</td>
<td></td>
<td>*</td>
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<td></td>
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<tr>
<td>1979 - 1983</td>
<td></td>
<td>*</td>
<td>*</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 3.4 Major floods

<table>
<thead>
<tr>
<th>Year</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1931</td>
<td>Brisbane flood</td>
</tr>
<tr>
<td>1957</td>
<td>Floods in NSW caused damage to a number of irrigation storages</td>
</tr>
<tr>
<td>1974</td>
<td>Brisbane flood</td>
</tr>
</tbody>
</table>

(b) Authority analysis

Establishment period

The 1896-1904 drought, and a depressed streamflow situation up until 1910, necessitated the construction of regulation storages by a number of authorities early in the period. The 1925-1928 drought in Victoria again necessitated augmentation of water supply storages.

The application of long periods of water supply restriction in Adelaide prompted suggestions that the state should utilise Murray River water for metropolitan water supply. (49)
Expansion period

In the Expansion period, most authorities exceeded the capacity of resources within their jurisdiction, and had recourse to requests to government for allocation of further catchments. By the end of the period, only a limited number of unallocated catchments remained, leading to intense competition between authorities for the remaining resources. The Snowy Mountains Scheme was justified on the basis of the transfer of extensive quantities of water from east to west for use in irrigation.

The Sydney Board's request for allocation of waters of the Shoalhaven River in the late 1960s brought the Board into conflict with the Water Resources Commission. There had been a long history of deterioration in water quality of Sydney Harbour and the ocean beaches as a result of backlog in sewerage, and inadequate provision of treatment of ocean discharge in a situation of vastly increased quantities of sewage discharged. The Report of the Senate Select Committee on Water Pollution noted that some three quarters of a million people in the Board's area were unsewered, that sewage overflows occurred frequently, and that ocean beaches were regularly contaminated by sewage matter. (50)

In 1960, the Melbourne Board sought an extension to its catchment areas. The Board was required to compromise its 'closed catchment' policy in order to secure additional runoff from the Yarra River tributaries. In 1963, the Board again sought additional water resources, with a request for allocation of the Big River (a Murray River tributary) catchment. The request brought the Board into conflict with the SRWSC. The subsequent Public Works Committee Enquiry allocated the Thompson River to the Board, and recommended development of the lower Yarra River as a future source of supply.

SA commenced use of the Murray River for town water supply as early as 1944. In 1958, the SA Premier challenged the Snowy Mountains Agreement, and thereby secured for SA a further allocation of Murray water. By 1964, the EWSD had fully utilised its share of Murray waters. As a result, during the 1964 to 68 and 1972 droughts, the available water resources were stretched to the limit, necessitating the application of severe water supply restrictions. In 1962, SA proposed the construction of a storage (Chowilla) on the lower Murray to provide further regulation of flow for SA use. As outlined earlier, Chowilla was ultimately replaced by a storage (Dartmouth) on a tributary of the upper Murray River.

Brisbane was faced by a severe drought in the period 1964 to 1966, and by a major flood in the Brisbane River in
1974. The construction of a major flood regulation, water supply and hydro-electric storage was proposed on the upper Brisbane River (Wivenhoe Dam).

Salinity problems first occurred during the 1980s in the Shepparton - Goulburn Valley irrigation area. The problem was viewed as one of water application practice rather than as any basic problem inherent in irrigation. By the late 1960s, water regulation in Victoria was approaching full utilisation of exploitable supplies.

The level of utilisation of available resources for a range of exploitation strategies are illustrated in Figures 3.6 and 3.7.

Re-politicisation period

The Sydney Board proceeded with construction of the Shoalhaven scheme, involving a major basin transfer of water to augment resources of the Nepean River basin. The Board also undertook a major programme of upgrading of the ocean outfall sewers and inland treatment plants, in response to mounting criticism of deterioration in the quality of ocean beaches and inland streams.

The Melbourne Board further compromised its 'closed catchment' policy, with the implementation of the Yarra Brae project, and completed the construction of the Thompson River Dam and basin transfer facility. Serious degradation in water quality of metropolitan streams and Bay occurred as a result of backlog in sewerage and overload of the Werribee Sewage Farm. The South Eastern Sewage Treatment Plant was constructed during the period to enable sewerage of the eastern suburbs of Melbourne.

Pollution emerged as a major problem in the EWSD systems in the period, with growing pollution of metropolitan reservoirs as a result of farming within the catchments, salinity in the Murray River, and pollution in Spencers Gulf as a result of the discharge of inadequately treated sewage. In view of the deterioration of quality of water in the Murray River, the SA government sought the co-operation of other parties to the River Murray Agreement to an amendment to the Agreement to incorporate provision for salinity control. The amendment was finally agreed in 1982.

Wivenhoe Dam was constructed on the Brisbane River as a multi-purpose storage during the period, and the Brisbane City Council completed construction of the North Pine Dam and treatment plant. Serious deterioration in quality of streams in the Brisbane area occurred during the period, as a result of the backlog in the provision of sewerage.

Both NSW and Victoria had reached almost full utilisation
FIGURE 3.6 LEVEL OF UTILISATION OF AVAILABLE RESOURCES: METROPOLITAN WATER AUTHORITIES

Water Utilisation (% of exploitable supply) vs Year

- Melb - Run of River
- Brisb - Run of River
- Melb - Regulation
- Syd - Regulation
- Brisb - Regulation
- Adel - Regulation
- Melb - Basin Transfer
- Syd - Basin Transfer
- Adel - Basin Transfer


Water Utilisation (% of exploitable supply)
FIGURE 3.7 LEVEL OF UTILISATION OF AVAILABLE RESOURCES:
RURAL WATER AUTHORITIES

Water Utilisation (% of exploitable supply)

Year

Vic - Run of River
SA - Run of River
NSW - Run of River
NSW - Regulation
SA - Regulation
Vic - Regulation
Qld - Run of River
of the exploitable supply of inland streams by the beginning of the period. Severe losses in crops as a result of rising salinity became apparent in the middle reaches of the Murray Valley during the period, necessitating the construction of works to ameliorate the problem.

Extensive private diversion of streamflow, on the basis of run-of-the-river diversion, had occurred in Queensland over the years. Available resources based on this technique reached full utilisation by the beginning of the period, necessitating government investment in the construction of regulation dams.

### 3.4.2 Legal and administrative jurisdiction

Section 2.5.6 outlined the perspectives prevailing at the time of establishment of the authorities, regarding the administrative forms of government authorities, and their associated legal and administrative jurisdiction.

Delegated powers and jurisdiction are important determinants of the types of administrative and technical solutions which may be imposed. Administrative powers and jurisdiction include the right to levy charges, determine bylaws, require actions by other parties, and to undertake and operate works in certain areas. The categories of legal and administrative authority are summarised in the Table 3.5.

Functional responsibilities may be classified according to the major services that the organisation is required to undertake (water supply, sewerage, irrigation, stock water supply, flood control), or according to its administrative function (development, operation & administration, regulation, licencing, planning). Functions allocated to the authorities are summarised in Table 3.6.

An organisation's area of jurisdiction includes both the geographic areas for which it has responsibility for the provision of services, and the areas over which it has the rights to collection and regulation of streamflow. The substantial growth which occurred in the Sydney and Melbourne urban areas during the Expansion period necessitated the extension of service areas covered by these authorities.

As noted in Table 3.6, the Sydney Board and the WCIC had responsibility for operation and administration of services only at the time of their establishment.

There was a degree of divestment of functions by authorities in those areas in which they were ineffective. Consequently, the SRWSC and WCIC shifted from broad irrigation area land development, settlement and
administration authorities, to the reticulation and operation of bulk water supply systems. Both the SRWSC and the WCIC lost responsibility for administration of land settlement and irrigation administration at an early date.

The powers of the Brisbane City Council in respect to administration of water supply and sewerage were highly prescribed in the legislation transferring the functions from the Brisbane Water Supply & Sewerage Board.

Governments utilised the rural water authorities to extend assistance to farmers in the post-War period by means of Farm Water Supply schemes. The rural water authorities seized upon the instrument of River Improvement Trusts as a means for increasing the hydraulic capacity and water distribution efficiency of streams.

In the mid-1970s environment of scarce remaining unallocated resources, governments recognised the need to rationalise the allocation of the remaining resources, and amended statutes to enable state wide water resources planning. The responsibility for planning in the case of Victoria was vested in the Ministry of Water Resources; an amendment which constituted more a hierarchical shift in responsibility rather than the adoption of broad water resource planning and management concepts.

In the case of SA, substantial legislative and administrative reform occurred to establish the legal and administrative structures appropriate to managing a resource within a pluralistic society.

The NSW Machinery of Government Review led to the re-constituting of the WCIC as the Water Resources Commission, with an additional mandate to undertake state wide water resources planning, and to incorporate advisory committees.
Table 3.5 Classification of authorities

<table>
<thead>
<tr>
<th>Public authority classification</th>
<th>Separate legal identity</th>
<th>Accountability</th>
<th>Funding</th>
</tr>
</thead>
<tbody>
<tr>
<td>Local Government</td>
<td>Yes</td>
<td></td>
<td>Rates &amp; borrowing</td>
</tr>
<tr>
<td>Brisbane CC</td>
<td></td>
<td>Local rate-payers.</td>
<td></td>
</tr>
<tr>
<td>Public Corporations</td>
<td>Yes</td>
<td>Parliament</td>
<td>Rates &amp; borrowing</td>
</tr>
<tr>
<td>Sydney Board</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Melbourne Board</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Department Corporations</td>
<td>Yes</td>
<td>Parliament</td>
<td>Treasury appropriat.</td>
</tr>
<tr>
<td>SRWSC of Vict</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>WCIC of NSW</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>IWSC of Qld</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Government Departments</td>
<td>No</td>
<td>Minister</td>
<td>Treasury appropriat.</td>
</tr>
<tr>
<td>EWSO of SA</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Notes: 1. The Sydney Board was made responsible to the Minister in 1972.
2. The Melbourne Board was made responsible to the Minister in 1975.
3. In the case of the rural water authorities, the statutes nominated the Commissioner as 'person sole' responsible for the authority.
## Table 3.6 Statutory functions of authorities

<table>
<thead>
<tr>
<th>Authority</th>
<th>Functions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Local Govern</td>
<td>* * * * 1</td>
</tr>
<tr>
<td>Brisbane CC</td>
<td></td>
</tr>
<tr>
<td>Public Corp.</td>
<td>* * 1926 1924 2</td>
</tr>
<tr>
<td>Sydney Bd</td>
<td>* * 1923 *</td>
</tr>
<tr>
<td>Melb. Bd.</td>
<td></td>
</tr>
<tr>
<td>Depart. Corp</td>
<td>* until * * * 1944 1948</td>
</tr>
<tr>
<td>SRWSC</td>
<td>1933 3</td>
</tr>
<tr>
<td>WCIC</td>
<td>1940 until 1926 * 1946 1948 1976</td>
</tr>
<tr>
<td>IWSC</td>
<td>1931</td>
</tr>
<tr>
<td>Departments</td>
<td>* * * until 1958 1940 1978</td>
</tr>
<tr>
<td>EWSD</td>
<td>* * 1935 * 1930 4 1976</td>
</tr>
</tbody>
</table>

Notes: * functions allocated at time of establishment
1. Construction undertaken by government where works were outside the Council's area.
2. Retained P.Wks.Dept as construction agency until 1940
3. Responsibility for sewerage added in 1915
4. Transferred from EWSD in late 1940s, & re-conferred in 1978
5. Responsibility for sewerage added in 1939 & 1946
3.4.3 Financial resources

Section 2.5.5 outlined the economic context of government activities and economic strategies prevailing at the time of the establishment of the authorities. Economic growth to 1900 was essentially based on the 'exploitation of natural resources' model, in which the role of government was one of provision of land and the infrastructure (transport, water supply) required to exploit the land.

Establishment period

Growth in production in the establishment period was dependent on the diversification of rural production and on further improvements in production technology. Improvements in transport meant that production of perishable goods was now viable. The first World War engendered an 'empire' spirit, which in turn provided a strong impetus to rural development. This was reflected in an extensive programme of Soldier Settlement following the War. Land constraints emerged as a constraint on the rate of economic expansion in this period. (51)

The 1900-1930 period was one of greatly increased expenditure on 'closer settlement' as compared to the 1850-1890 period. This increased expenditure reflected:
.the diversification of primary industry;
.the electoral popularity of closer settlement;
.the adoption of programmes of 'soldier settlement';
.the response by governments to the rural electorate, particularly at a time of strong population shift to the urban areas. (52)

Table 3.7 Diversification of exports. (% of total exports)

<table>
<thead>
<tr>
<th>Period</th>
<th>Pastoral Industry</th>
<th>Agricultural Ind.</th>
<th>Minerals</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Wool Butter Meat Total</td>
<td>Wheat Fruit Total</td>
<td></td>
</tr>
<tr>
<td>1881-90</td>
<td>54.1 0.1 1.2 55.4</td>
<td>5.3 0.2 5.5</td>
<td>27.2</td>
</tr>
<tr>
<td>1891-1900</td>
<td>43.5 2.4 4.1 50.0</td>
<td>2.9 0.3 3.2</td>
<td>33.1</td>
</tr>
<tr>
<td>1901-13</td>
<td>34.3 4.1 5.1 43.5</td>
<td>9.7 0.5 10.2</td>
<td>35.4</td>
</tr>
<tr>
<td>1921-29</td>
<td>42.9 5.6 4.6 53.1</td>
<td>20.5 2.2 22.7</td>
<td>8.8</td>
</tr>
</tbody>
</table>


The water industry has historically been capital intensive as a result of the major investment required in headworks prior to the provision of services. Consequently, access to capital has been an important determinant of the organisation's ability to sustain its preferred strategies for the provision of services.
Public capital formation by 1900 represented 30% to 50% of the total, a remarkable experiment in government intervention. The early years of the twentieth century appeared to confirm the partnership of private and public sectors in driving the economy. Public capital formation was directed towards both rural infrastructure and metropolitan expansion. (53)

As noted in Table 3.5, some organisations were delegated power to raise their own loans, while other organisations were dependent on Treasury appropriations. Significant differences occurred between states, with closer scrutiny of borrowing and government appropriation pursued in the less prosperous states of SA and Queensland, than in NSW and Victoria.

The availability of funds varied significantly over the period, with virtually complete loss of funds during the recession periods of 1890-1905 and 1930-1940, and the post-War period of 1945-1953.

### Table 3.8 Loans approvals (values in $million)

<table>
<thead>
<tr>
<th>Authority</th>
<th>1911</th>
<th>1921</th>
<th>1931</th>
<th>1941</th>
<th>1951</th>
<th>1961</th>
<th>1971</th>
<th>1980</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sydney Board</td>
<td>10</td>
<td>52</td>
<td>96</td>
<td>226</td>
<td>1648</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Melb. Board</td>
<td>18</td>
<td>29</td>
<td>29</td>
<td>50</td>
<td>90</td>
<td>230</td>
<td>500</td>
<td>2000</td>
</tr>
</tbody>
</table>

While the Melbourne Board had power to set rates, given the large local government representation on the Board, its powers were always curtailed by parochial local government interests. Consequently, the practice of covering the cost of all construction works by loans was adopted, with rates limited to covering the interest and amortization of loans, operation and maintenance costs, and overheads.

**Expansion period**

As noted in Section 3.3.1, national development became the major political goal, with priority given to public investment in energy resources and transport. In a situation of scarce capital, the metropolitan Water Boards faced difficulties in attempting to keep up with the burgeoning metropolitan growth. (54)

In a climate of scarce capital, governments centralised public works funding through the Loans Council, resulting in severe constraints on borrowing by the Boards during the 1950s. (55)

The metropolitan water authorities suffered a serious backlog in the provision of services in this period. The
Sydney Board adopted a range of alternative revenue raising strategies, including the adoption of 'developer contribution' to the cost of establishing infrastructure in new urban areas. This strategy was adopted later by the Melbourne Board.

Throughout, the metropolitan water authorities have based their rates on the average cost of provision of services rather than on marginal costs. Governments retained tight control over the level of rates set by the Boards. In the case of rural water supplies, there was a long history of government subsidisation of services and acceptance of rural water supply debts.

Re-politicisation period

The Federal government implemented the Sewerage and Water Supply Assistance Programme in 1973. The programme comprised direct grants to authorities to enable full provision of services.

In the inflationary and unemployment climate of post 1975, governments attempted to rationalise investment, with the adoption of the principle of 'user pays', more critical scrutiny of public authority efficiency, and a requirement that authorities provide a return on public investments in some cases.

Not until the high cost of borrowing in the mid 1970s was there a review of the appropriate level of self-financing within the metropolitan water authorities.

Table 3.9 Percentage self-financing

<table>
<thead>
<tr>
<th>Authority</th>
<th>1901</th>
<th>1911</th>
<th>1921</th>
<th>1931</th>
<th>1941</th>
<th>1951</th>
<th>1961</th>
<th>1971</th>
<th>1980</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sydney Board</td>
<td>0</td>
<td>40</td>
<td>0</td>
<td>20</td>
<td>20</td>
<td>12</td>
<td>25</td>
<td>20</td>
<td>12</td>
</tr>
<tr>
<td>Melb. Board</td>
<td></td>
<td>0</td>
<td>0</td>
<td>15</td>
<td>10</td>
<td>5</td>
<td>7</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Adelaide</td>
<td>15</td>
<td>50</td>
<td>50</td>
<td>0</td>
<td>0</td>
<td>12</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Brisbane</td>
<td>20</td>
<td>0</td>
<td>0</td>
<td>35</td>
<td>35</td>
<td>10</td>
<td>40</td>
<td>30</td>
<td></td>
</tr>
</tbody>
</table>

3.4.4 Available technology

The term 'technology' is widely used in the literature to describe a number of concepts, including:
- the machines, tools and instruments used as an adjunct to increased productivity (56, 57);
- the specialised body of knowledge, skills and techniques which prescribe the manner of undertaking work tasks (58, 59, 60, 61, 62);
- the concept of the technical rationality associated
with technology as an all-pervasive cognitive standard (63);
the ideological concepts of application of scientific-technical knowledge in the service of the community and of the application of technical rationality in the efficient organisation of tasks.

The technology available to authorities not only enables significant savings in the cost of works, but it also enables an increasing scale of undertakings (large dams, tunnels, etc), and the introduction of new techniques (water and wastewater treatment) commensurate with servicing a growing population. In addition, the utilisation of technology conveys a perception of the organisation as technically and professionally expert in the public's view.

Technology utilised over the period of the analysis ranges from largely empirically based knowledge of the nineteenth century, through growth in theoretical knowledge in the post-second World War period, to Research and Development and data processing based technologies of the 80s.

Establishment period

Technology through much of the establishment period was limited to empirical knowledge and practice, drawn largely from British canal, mining and railway practice of the nineteenth century. Mechanisation was limited to pumping equipment, which was borrowed from mining engineering practice. Sewerage techniques drew extensively on the principles identified by the Sanitation Movement in Britain. Rutherford notes that many mistakes were made in the siting of irrigation areas, partly due to technical ignorance and partly due to political interference (64).

British technical practice was modified in the case of irrigation water supply as a result of the inapplicability of British techniques in a continent characterised by extreme variation in streamflow. Irrigation was based on practice in the western coast of the USA. This was a reflection of the close climatic similarities occurring between the western coast of the USA and Australia, the influence of Alfred Deakin on the early development of irrigation administration, and the involvement of a number of Americans in the early implementation of irrigation in Victoria and SA.

The knowledge required to assess and regulate the extremely variable Australian streams required development of local knowledge and techniques. Considerable attention was given from an early date to streamflow measurement. The construction of large regulating storages required the construction of high retaining structures. A number of radical earthfill embankment designs emerged in the early
part of the twentieth century.

Expansion period

In the expansion period, mechanisation developments experienced during the War enabled a substantial scaling up of works in the post-War period, commensurate with the rapid growth in demand for services. Heavy earthmoving and tunnelling equipment enabled the adoption of new design solutions and major savings in labour. While major advances occurred in water and wastewater treatment technology in this period, with the exception of the Brisbane City Council, there was limited utilisation by other authorities of these advances.

The 1950s and 60s was a period of dramatic improvements in dryland farming, with the adoption of the use of fertilisers, improved crop strains, new equipment, and the use of pesticides.

Re-politicisation period

In the re-politicisation period, there were rapid advances in data handling technology, and in the science of water and wastewater treatment. Given the significant water pollution issues confronting most authorities, the authorities substantially developed their scientific data collection and analytical capacities, and adopted modern water and wastewater treatment technologies.

3.4.5 Human resources

The number of experienced engineers available during the establishment period was extremely limited. Consequently, authorities were largely dependant on tradesmen and overseers to undertake works, and on the crafts of book-keeping to maintain assessing and receiving tasks. Mechanics Institutes proliferated in the period as workmen sought to develop skills.

The lack of experienced technical personnel in this period consolidated the authority of the Engineer-in-Chief in early administration.

Engineering faculties were not introduced into universities until the 1920s. The Institution of Engineers Australia was established in 1919.

Immigration of skilled labourers and professional people in the post-War period provided the human resources required for the massive programmes of national development and infrastructure provision undertaken in the post-War years. A major growth in the number of engineering graduates occurred in the post-War years (refer to Table 3.2).
The complexity of issues confronted by the authorities in the re-politicisation period necessitated the expansion in scientific and process technology personnel. Authorities were slow to appoint personnel trained in the 'soft' sciences and humanities.

3.5 Summary

The analysis of the operating environment of the water authorities indicates a remarkable picture of continuity over the establishment and expansion periods (70 to 80 years), with primary focus throughout on the provision of specific services related to the material well being of the community in a climate of strong support for development programmes.

The only changes in the statutes over the period was the addition of some functions in the case of the metropolitan and rural water authorities, and the removal of responsibility for the settlement and administration of irrigation areas in the case of the rural water authorities. Up until the mid-1960s, authorities had jurisdiction over sufficient water resources to sustain their preferred service implementation strategies and techniques.

Superimposed on these factors were the vagaries of climate and financial markets. Scarcity of capital funds deferred the implementation of programmes on a number of occasions, while periodic droughts resulted in unscheduled shortfall in the provision of services.

The re-politicisation period represented a major shift in virtually every area of the operating environment, as follows:

- community needs and expectations changed from specific services to a diverse and conflicting range of environmental and service expectations;
- the scale of inter-dependencies of water programmes with other authority functions and government programmes significantly escalated;
- full utilisation of exploitable supply based on traditional implementation techniques was approached in a number of cases;
- government focus shifted from development to improved co-ordination of programmes to better respond to a range of community expectations;
- introduction of environmental legislation constrained traditional implementation techniques of authorities;
- there was a decline in the level of support for rural development programmes;
- funds became extremely tight.
Table 3.10 summarises the nature of the external factors impinging on authority decision making over the three periods of analysis.
<table>
<thead>
<tr>
<th>External inputs</th>
<th>Est. Exp. ReP.</th>
<th>Legitimation implications</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Political support:</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>. Provision of services as a means of improving the standard of living, providing basic services (home ownership)</td>
<td>/ / /</td>
<td>Effective provision of services accessible to all (affordable).</td>
<td></td>
</tr>
<tr>
<td>. Promotion of closer settlement as means of fostering rural growth &amp; providing opportunities for farm ownership.</td>
<td>/ - x</td>
<td>Establishment of Vict.as irrigation blocks &amp; main provision of water centre. supply.</td>
<td></td>
</tr>
<tr>
<td>. Sensitivity to the rural electorate &amp; interest groups, in view of disproportionate vote, CP influence &amp; 'New State' agitation.</td>
<td>/ / -</td>
<td>Provision of farm, stock, domestic water supply &amp; other services. Symbolic nature water conservation works.</td>
<td></td>
</tr>
<tr>
<td><strong>Client support:</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>. Provision of services expectation &amp; extension to meet growth in population and demands.</td>
<td>/ / /</td>
<td>Effective provision of service upon demand</td>
<td></td>
</tr>
<tr>
<td><strong>Role of government expectations:</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>. Provision of services where collective action required to secure the general interest, or in the case of under-developed communities.</td>
<td>/ / /</td>
<td>Provision of service upon demand.</td>
<td></td>
</tr>
<tr>
<td>. State as a vast public utility in the service of the individual.</td>
<td>/ / /</td>
<td>Subsidise service on basis of fostering self sustained growth.</td>
<td></td>
</tr>
<tr>
<td>. Allocation &amp; management of - natural resources in the broad community interest.</td>
<td>- /</td>
<td>Provision of service upon demand.</td>
<td>Planning &amp; development best responding to broad community interests.</td>
</tr>
</tbody>
</table>

**Notes:**
- / important factor during the period
- / ambivalent factor during the period
- / not a factor during the period
Table 3.10 (b) **Summary of external inputs and their legitimiation implications: Criteria guiding implementation**

<table>
<thead>
<tr>
<th>External inputs</th>
<th>Est.Exp.ReP. Legitimation implications</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Political support:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>.Compliance with expected standards of behaviour &amp; performance</td>
<td>/ / /</td>
<td>Technical, administrative &amp; financial competence, effective provision</td>
</tr>
<tr>
<td>.Scrutiny of programmes in view of relegation of parliamentary powers.</td>
<td>/ - -</td>
<td>Compliance with statutes, technical competence.</td>
</tr>
<tr>
<td><strong>Client support:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>.Affordability of services &amp; equitable allocation of charges.</td>
<td>/ / /</td>
<td>Provision of service at cost. Ability to pay as basis of recovery of costs. Subsidisation of services in case of rural water supplies technically competent.</td>
</tr>
<tr>
<td>.Compliance with the law &amp; principles of fairness, equity &amp; general interest</td>
<td>/ / /</td>
<td>Operation in accordance with prescribed functions.</td>
</tr>
<tr>
<td><strong>Role of government expectations:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>.Compliance with environmental controls &amp; objectives.</td>
<td>- - /</td>
<td>Ensure projects sensitive to environmental protection requirements.</td>
</tr>
</tbody>
</table>

**Notes:** / important factor during the period  
- ambivalent factor during the period  
x not a factor during the period
Table 3.10 (c) Summary of external inputs and their legitimation implications: Criteria guiding implementation

<table>
<thead>
<tr>
<th>External inputs</th>
<th>Est. Exp. ReP</th>
<th>Legitimation implications</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Administrative practice:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>. Provision of services based on demand.</td>
<td>/ / x</td>
<td>Projection of demand as basis for programming works.</td>
<td></td>
</tr>
<tr>
<td>. Allocation of costs based on principles of fairness, equity &amp; general interest.</td>
<td>/ / /</td>
<td>Property based rates as means of charging</td>
<td></td>
</tr>
<tr>
<td>. Commercial behaviour.</td>
<td>/ / /</td>
<td>Revenue covers costs of reasonable rate of return, public tendering, publication of accounts.</td>
<td>Except rural services</td>
</tr>
<tr>
<td>. Provision of services based on association of consumers, with elected representatives, &amp; nexus between service &amp; rates.</td>
<td>/ / x</td>
<td>Separation of functions technically, administratively &amp; financially.</td>
<td></td>
</tr>
<tr>
<td>. Technically administratively &amp; financially expert.</td>
<td>/ / /</td>
<td>Appointment of personnel expert in the relevant areas.</td>
<td></td>
</tr>
<tr>
<td>. Compliance with the law, including environmental legislation.</td>
<td>/ / /</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Notes: / important factor during the period  
- ambivalent factor during the period  
x not a factor during the period
Table 3.10 (d) **Summary of external inputs and their legitimisation implications: Resources**

<table>
<thead>
<tr>
<th>External inputs</th>
<th>Est.</th>
<th>Exp.</th>
<th>ReP.</th>
<th>Legitimation implications</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Physical resources:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>.Availability of water resources within jurisdiction</td>
<td>/ x</td>
<td>x</td>
<td></td>
<td>Extension of prevailing techniques, or seek further catchment allocation</td>
<td>Adoption of basin transfer in late 1960s MMBW forego closed catchm. EWSD adopt dem.mgmt</td>
</tr>
<tr>
<td>to pursue prevailing technique.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Legal &amp; administrative:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>.Power to raise loans.</td>
<td>/ /</td>
<td>/</td>
<td>/</td>
<td>Pursue preferred programmes insofar as funds will allow.</td>
<td>Closer scrutiny in SA &amp; Qld</td>
</tr>
<tr>
<td>.Power to set by-laws.</td>
<td>/ /</td>
<td>/</td>
<td>/</td>
<td>Utilise to protect effective implementation &amp; administration of techniques.</td>
<td></td>
</tr>
<tr>
<td>.Facility to extend service jurisdiction.</td>
<td>/ /</td>
<td>/</td>
<td>/</td>
<td>Pursue extension to obtain benefits of economy of scale.</td>
<td>Rural authorities lose irrigat admin.</td>
</tr>
<tr>
<td>.Independance to fully implement statutory functions.</td>
<td>/ /</td>
<td>x</td>
<td></td>
<td>Internal priorities determine allocation of funds.</td>
<td>Made respons. to Min.</td>
</tr>
</tbody>
</table>

Notes: / important factor during the period
- ambivalent factor during the period
x not a factor during the period
3.6 References

2. Ibid., p. 642
3. Ibid., p. 650
7. Metropolitan Bridges Highways & Foreshores Act of 1974
8. Melbourne & Metropolitan Board of Works (Reconstruction) Act of 1978
10. Ibid., p. 130
15. W. A. Sinclair, op. cit., pp. 211-227
17. Annual Reports, Queensland Irrigation & Water Supply Commission.
18. J. Rutherford, op. cit., p. 130
19. F. W. Eggleston, State Socialism in Victoria, P.S. King & Son, 1932, p. 79
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28. ibid., pp.413-416
29. J.Rutherford, op.cit., p.127

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34. K.O.Campbell, op.cit., pp.450-453
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49. Marriane D.Liebelt, op.cit., p.406
50. Australia, Report of the Senate Select Committee on Water Pollution, AGPS, 1970, pp.36-38
51. W.A.Sinclair, op.cit., pp.164-180
52. R.S. Parker, op.cit., p.60
53. N.G. Butlin et al., op.cit., p.17
54. ibid., pp.37-40
55. ibid., p.250
60. R. Blauner, op.cit.

61. J. Woodward, op.cit.
62. C. Perrow, op.cit.
63. D. Bell, op.cit.
64. J. Rutherford, op.cit., p.130
4. ORGANISATION OUTPUTS

4.1 Analytical framework

The major tasks confronting the authorities at their inception, and the legitimation implications arising from the authorities' external environments, were outlined in Chapters 2 and 3 respectively. In essence, they suggested that the major services and the principles to be adopted in their implementation, were as follows:

(a) Nature of services to be provided:

Metropolitan water authorities:
(i) Provision of a safe and reliable water supply as the basis of alleviation of urban deprivation and of providing an improved standard of living;
(ii) Provision of an adequate sanitation system as the basis of alleviation of urban deprivation and of providing an improved standard of living;
(iii) Provision of a drainage system providing an adequate level of public safety, protection of property, and local amenity, as the basis for an improved standard of living.

Rural water authorities:
(i) Provision and administration of irrigated blocks for closer settlement (up until the early 1960s), as the basis for promoting rural growth and prosperity, and providing opportunities for farm ownership;
(ii) Provision of an adequate and reliable irrigation water supply as the means of fostering rural growth and prosperity;
(iii) Provision of stock and domestic water supply, as the means for alleviating social and economic deprivation, as the basis of fostering rural growth and prosperity; and as a means of governments demonstrating their concern for the rural electorate (up until the mid 1960s);
(iv) Provision of assistance in the development of 'on-farm' water supplies, as a means of fostering rural growth and prosperity;
(v) Planning and development of water resources as a basis for promoting economic and national development, particularly during the expansion period.

(b) Principles of implementation of services:

(i) Provision of services in an effective and efficient manner;
(ii) Provision of services based on the principles of service upon demand, and equity and fairness;
(iii) Provision of services as a basis for the promotion
of material well being of the community during the establishment and expansion periods, and the quality of life and environmental protection objectives in the re-politicisation period;

(iv) Compliance with statutes in undertaking works and services, particularly during the establishment period;

(v) Demonstration of technical, administrative and financial competence, with major scrutiny on technical competence;

(vi) Generation of sufficient revenue to cover costs, together with a reasonable rate of return, except in the case of rural water supply, where subsidised works are provided as the basis of fostering rural development;

(vii) Adoption of rates as the most equitable system of recovering costs, except that charges to be limited to a level within the ability of the consumer to pay;

(viii) Administration based on declared water supply, sewerage, drainage, river improvement, or flood control Districts or metropolitan areas as the basis of provision of services and the setting and recovery of rates, with a nexus between the level of services demanded and the rates levied;

(ix) Co-ordination of public works (primarily in the expansion and re-politicisation periods) in order to ensure efficiency and effectiveness in the use of public funds;

(x) Allocation and management of water resources to be undertaken in a manner reflecting the general interest, with material well being and economic growth the primary focus during the establishment and expansion periods, and a wider range of social, economic and environmental objectives the focus of the re-politicisation period.

This Chapter focuses on the response of the authorities to these tasks and implementation principles.

4.2 Nature of service outputs

What was the level of provision and reliability of services achieved by the authorities over the period of analysis?

4.2.1 Metropolitan water authorities

(a) Water supply

Establishment Period

A 98% level of household connection was achieved by 1890 in the case of Sydney and Melbourne and was sustained throughout the period (refer to Figure 3.1).
Adelaide and Brisbane initially lagged in the level of provision, reaching 97% of households connected in Adelaide by 1931, and only 80% of households in the case of Brisbane by 1941.

Initially, the metropolitan water authorities based their supply on run-of-the-river type stream diversion, with the exception of a large regulating storage in the case of Melbourne (Yan Yean Reservoir, established in 1857). Later in the period, all the authorities were required to construct large reservoirs to store water to cover periods of depressed streamflow.

While regulation of surface flows was the principal source of supply, groundwater was used to supplement Adelaide's water supply during a period of deficiency in the 1930s, and limited re-use of sewage effluent was introduced for the irrigation of parkland. The pattern of evolution in water utilisation and implementation techniques, from run of the river, to regulation, to basin transfer, is illustrated in Figures 3.6 & 3.7.

Protection of water quality was provided by the exclusion of public entry into catchments (closed catchments) in the case of Melbourne and by the adoption of catchments with sparse settlement in the case of Sydney and Adelaide. The use of the Brisbane River for the Brisbane water supply necessitated the early adoption of water treatment by the Brisbane City Council. Consequently, the resolution of water quality management needs was an integral part of the adopted supply technique.

The authorities undertook the development of water supply storages on the basis of 'sustained supply over the worst drought on record'. However, shortages of water were commonly experienced, necessitating the application of restrictions on water use. Severe water use restrictions were applied by all authorities over the 1930s, reflecting a period of depressed flow, the drying up of capital required to construct new storages during the Depression and War years, and growth in demands.

An analysis of the timing of new headworks construction in relation to the occurrence of drought (refer to Figure 4.1) suggests that the incidence of droughts rather than systematic planning was the principal factor driving headworks augmentation programmes.

Brisbane City Council entered into a number of bulk water supply agreements with surrounding local government authorities during the period, while the Sydney Board negotiated with adjacent local government areas to extend its service area.
FIGURE 4.1 CORRELATION OF DAM CONSTRUCTION WITH DROUGHT INCIDENCE

Typical lead time for the investigation, design & construction of dams

Timing of Dam construction following major droughts (Yrs)

Number of samples $N = 123$
Expansion period

A high level of household connection was maintained throughout the period, notwithstanding the enormous growth in demand. The level of provision in Brisbane improved to 90% of households during the period.

All authorities undertook substantial augmentation of water supply storages with the construction of large dams during the period. A situation of full utilisation of exploitable resources of the Adelaide metropolitan catchments was reached in the early 1960s, necessitating the transfer of Murray River (1954) water to meet further demands. The use of groundwater continued into the 1950s to meet the shortfall in supply from surface sources, and the re-use of sewage effluent was extended.

As the Melbourne and Sydney Boards approached full utilisation of water resources within their jurisdiction in the early 1960s, they began negotiations for allocation of additional water resources in catchments outside the metropolitan basins; the Big River in the case of Melbourne and the Shoalhaven in the case of Sydney. The claim on the Big River was challenged by the rural water interests in Victoria, and ultimately, the Board was allocated the upper Thompson River catchment. The Melbourne Board was forced to shift from a closed catchment as the basis of water quality management to a controlled catchment policy in the case of the Yarra Tributaries and the Thompson River scheme. Brisbane City Council upgraded its water treatment plant as the basis of water quality control.

Severe restrictions on the use of water were imposed in all metropolitan areas in the post-War years and during the 1964-68 drought pending completion of new storages.

Brisbane City Council continued to enter into bulk water supply agreements with adjacent local government areas.

Re-politicisation period

The basin transfer schemes were implemented during the period in the case of Sydney and Melbourne, while in addition, the Melbourne Board implemented the Yarra Brae scheme. Brisbane constructed a further regulating storage within its metropolitan catchment. South Australia sought further allocation and regulation of Murray River waters as the means of safeguarding the metropolitan water supply.

As the Yarra Brae scheme in the case of Melbourne involved use of water from an open catchment, the Board was finally required to undertake full water treatment. Deterioration of water quality in the Adelaide system, as a result of increased development pressures within the metropolitan catchments, necessitated the incorporation of full water treatment.
FIGURE 4.2 DEVELOPMENT OF WATER STORAGES

Cumulative Storage (millions acre-ft)

1900 10 20 30 40 50 60 70

YEAR

1897-1904
1913-1915
1937-1939
1943-1945
1965-1968
1972

Major Droughts
World Wars

SR&WSG, WGIG, SMHEA, HEC of the
Water Resources Commission,
Ministry of Water Resources

MWS&D B
MMBW

SR&WSG Constituted
WGIG Constituted
SR&WSG, MMBW

SMHEA Constituted
The severity of the 1979-83 drought again forced authorities to impose severe water use restrictions. As all exploitable water resources had been allocated, the old policy of development of new catchments to meet growth in demand was no longer valid, and authorities were forced to shift to a greater focus on better management of the existing resource. Adelaide introduced new tariff structures and charges to promote efficient water use.

With the exception of North Pine Reservoir (Brisbane City Council), recreation was excluded from all metropolitan water supply reservoirs on the basis of water quality protection.

Figure 4.3 indicates changes in the provision of storages on a per capita basis over the period of analysis. The increase in storage volume per capita is a reflection of both higher standards of reliability adopted by the authorities and the larger storage volumes required as full utilisation of exploitable supply is approached. Figure 4.4 indicates the significant increase (100%) in per capita consumption over the period of analysis.

(b) Sewerage (Sanitation)

Establishment period

A high level of provision of sewerage to households was achieved early in the period (refer to Figure 3.2) in Melbourne (95%), with Sydney and Adelaide lagging at 70% and 55% respectively, while Brisbane had achieved only 35% provision.

The lag in Sydney reflected the difficult nature of terrain encountered in the construction of sewers, while Adelaide reflected a low priority on sewerage provision. Brisbane City Council had inherited a substantial backlog, technical deficiencies, and a considerable debt in the sewerage scheme that was transferred from the Brisbane Water Supply and Sewerage Board.

The authorities initially adopted sewage farms as the basis of disposal of wastes. Sydney shifted to adoption of ocean outfall sewers in 1888 as the basis of disposal. Complaints regarding pollution of ocean beaches by sewage became common in the 1930s. The Board undertook to introduce primary treatment of sewage prior to discharge.

Adelaide undertook the construction of a number of regional sewage treatment plants (Glenelg and Port Adelaide) to augment treatment at the Islington Sewage Farm, while Brisbane, still encumbered with difficulties in the implementation of its sewerage system, maintained a system
FIGURE 4.3 PROVISION OF WATER SUPPLY STORAGES

FIGURE 4.4 WATER CONSUMPTION
of night soil collection (including the provision of depots to receive collected waste) as the basis of sanitation during the period.

Expansion period

A significant backlog in the provision of sewerage to households emerged in the 1950s and 60s in Sydney (35%) and Melbourne (20%). The SA government undertook a major programme of sewerage in Adelaide as part of the government's programme of encouraging industrial growth. Some 96% of households were sewerized by the end of the period. Brisbane Mayor Clem Jones undertook a major programme of sewerage, increasing the level of provision from 40% to 80% over the period.

Melbourne and Adelaide adopted extensive use of Septic Tanks as a stop-gap means of sanitation in the developing urban areas. The Sydney Board attempted to limit development to those areas in which services existed, and imposed developers' charges as a means of resolving the 'lack of finance' restriction on service provision. Developers in Sydney, Melbourne and Brisbane were required to undertake sewerage as part of the sub-division.

All authorities continued to use the existing disposal facilities through much of the period, with loadings well in excess of those for which the facilities were designed. In the late 1960s, the Melbourne Board constructed a number of temporary package plants to provide local treatment until such time as trunk sewers were constructed. The Sydney Board commenced the construction of a number of inland sewage treatment plants to service new urban areas outside the catchments of the ocean outfall sewers. Slow progress was made on the provision of primary treatment of ocean outfall discharges. Consequently, the pollution of ocean beaches became more acute over the period.

Adelaide augmented and upgraded its regional sewage treatment plants and commenced work on a new plant to replace the overloaded Islington Sewage Farm. Confronted by severe capacity constraints on its trunk sewers, Brisbane adopted the policy of discharging sewers to local drains in 1955.

Re-politicisation period

As a result of the severity of pollution of metropolitan streams and beaches, a major environmental concern emerged early in the period. Governments legislated to limit the level of wastes discharged. As a result, the already overloaded Sydney system was required to accommodate industrial waste discharges. Butlin notes that the Sydney Board has been a major polluter of the Sydney environs as a result of sewerage overflows, the backlog in sewerage, and
the inadequate level of treatment provided. (1)

The Commonwealth government implemented a Sewerage Assistance Programme to assist in rectifying the serious backlog in sewerage. A level of 95% provision of sewerage was achieved by 1981.

The Sydney Board undertook a major programme of augmenting and upgrading its inland treatment plants and ocean outfalls as the means of ameliorating levels of pollution. Significant progress was made on the implementation of primary treatment of ocean outfall discharges. The Melbourne Board completed a major new South Eastern Sewage Treatment Plant and Ocean Outfall line to Cape Schank, and undertook upgrading of the Werribee Sewage Farm. Adelaide commissioned its new Bolivar Sewage Treatment Plant.

Authorities gave closer attention to programmes of infiltration control and sewer replacement, and trade waste standards and charges came under review.

(c) Metropolitan drainage & flood control

Responsibility for the provision of drainage was delegated to the authorities in the 1920 to 30 period in most cases. Works comprised the upgrading and augmentation of existing local government drains in many cases. The works were used as the basis for unemployment relief programmes in Sydney, Melbourne and Adelaide during the Depression.

The post-War period saw the construction of large concrete drains and floodways to accommodate the additional runoff from the new urban areas. In the late 1960s, there was a shift to the use of retardation basins to limit flows to levels consistent with the capacity of downstream drains. There was growing criticism in the 1970s of the extent of loss of urban creeks and streams as a result of drain construction.

The EWSD commenced the Metropolitan Flood Relief Scheme in 1935, while the Melbourne Board adopted development controls in the Yarra River flood plain as the basis of flood management. Little progress was made in resolution of the Brisbane flooding problem until the 1974 flood, when Commonwealth, state and local government authorities agreed on the construction of a large flood retention storage (Wivenhoe Dam) at the head of the Brisbane River. There had been a failure on the part of Brisbane to apply development controls on the flood plain.
4.2.2 Rural water authorities

(a) Irrigation & drainage

Establishment period

Rapid expansion in the establishment of irrigation areas occurred in Victoria (refer to Figures 4.5 & 4.6), with 200,000 ha under intensive irrigation by the end of the period. There was also substantial development of irrigation in NSW, with 150,000 ha under intensive irrigation by the end of the period. Queensland displayed strong growth in irrigation, but primarily as a result of private development. Irrigation development in SA was limited to the upper Murray fruit growing areas and the floodplain along the lower reaches.

Irrigation in Victoria was predominantly flood irrigation, with water supplied by means of large regulating storages and diversion channels. NSW extensively utilised natural streams and floodplains as a basis for irrigation water transfer and irrigation, in addition to the use of diversion channels. Irrigation in Queensland and SA was primarily by run-of-the-river diversion and spray irrigation. In addition, groundwater resources were used for irrigation in a number of cases in Queensland.

As noted earlier, Victoria initially experienced difficulty in attracting settlers for the serviced irrigation blocks, and had to resort to an immigration programme to attract settlers. Returned Soldiers from the First World War and Empire Settlers provided a source of settlers in the 1918-30 period.

The practice of providing 'free headworks' was adopted in Victoria from an early date as successive governments offset costs to the irrigators in an attempt to make irrigation blocks economically viable. Other states followed that practice. Water charges were determined on the basis of operation of distribution system costs only. In addition, governments wrote down the assessed value of blocks as a means of reducing water charges. Compulsory payment for water rights was levied on all blocks.

In the case of the rural water authorities, the annual water allocation was varied according to the amount of water available in storages at the commencement of each irrigation season. Consequently, the level of supply was conditional on the season rather than on a guaranteed supply to the irrigator.

By the end of the period, a substantial number of stream diversion licences had been issued in NSW (refer to Figure 4.7).
FIGURE 4.6 DEVELOPMENT OF IRRIGATION AREAS: EXTENSIVE IRRIGATION

Year

Irrigation Area (ha)
FIGURE 4.7 NUMBER OF DIVERSION LICENCES

Number of Licences

10,000

5000

0

Year


NSW
Expansion period

Further rapid growth in the extent of irrigated land occurred in Victoria and NSW during the period, promoted in part by Soldier Settlement. There was continued steady growth of irrigation in Queensland and limited growth in SA. Irrigation on the lower Murray became viable following the completion of the Lower Murray Barrages which excluded the ingress of ocean water into the lower reaches of the River. Some 90% of irrigation in Victoria was undertaken by the government, whereas only 10% of irrigation in Queensland was undertaken by the government.

The Snowy Mountains Scheme increased the availability of water for irrigation from the Murrumbidgee and Murray River areas. SA was allocated a share of the Snowy waters as a result of its challenge on the validity of the Scheme.

There was a substantial growth in the construction of dams in the period in NSW well ahead of any demonstrated demand for irrigation water supply (refer to Figure 4.8). There was also a commencement on irrigation storages in Queensland as demand in some basins exceeded the run-of-the-river yield. Groundwater constituted some 58% of the total volume of water utilised for irrigation in Queensland.

Salinity problems began to emerge in the Shepparton Goulburn area of Victoria and in the middle reaches of the Murray. The problem was resolved by provision of drainage, and modification in the irrigation water application practice. SA became concerned at the increased levels of salinity in the lower Murray and sought to have water quality management requirements incorporated into the River Murray Agreement.

There was strong growth in licences during the period in NSW. Licences were used more as a means of setting charges and raising revenue than as a control over resource utilisation.

Re-politicisation period

Except for Queensland, there was only limited additional irrigation development during the period. Some growth occurred in private irrigation in areas such as the Namoi Valley in NSW. Much greater focus was given to the administration of diversion licences as resource utilisation approached the level of exploitable supply. Some 80% of irrigation areas in Victoria were government based, while only 20% of irrigation areas in Queensland were government based.

There was a carry over of dam construction in NSW, while there was a significant increase in the level of
construction of dams in Queensland, well ahead of any demonstrated demand in a number of river basins. This is evident in the marked increase in storage volume per hectare of irrigated land displayed in Figure 4.8.

Following dispute over the Chowilla Dam in SA, the parties to the River Murray Agreement finally agreed on the construction of a large dam (Dartmouth) on a tributary of the upper Murray.

Generally, until such time as salinity problems emerged, little attention was given to the provision of irrigation drainage. Salinity problems reached a crisis level during the period, and agreement was finally reached between governments to the implementation of a programme of abatement, including the interception of irrigation area drainage waters high in salinity and diversion of the drainage to evaporation basins. Meanwhile, groundwater levels throughout the irrigation areas are rising to a level where salinity problems will be further aggravated.

(b) Domestic and stock water supply

Major development of stock water supply based on artesian bores was undertaken in Queensland and NSW in the period 1880 to 1920. Queensland undertook a Trunk Stock Route Water Supply programme largely based on bore water supply. (refer to Figure 4.9: Number of bore licenses)

An extensive stock water supply system was developed in Victoria by the irrigation Trusts, prior to the establishment of the SRWSC, in the Mallee and Wimmera areas. The Commission undertook a major programme of upgrading of these works. This system was combined with a system of private tanks.

In the period 1931-41, the WCIC undertook the establishment of a system of Irrigation Districts, within which water for stock water supply and limited irrigation was distributed via natural and constructed channels (refer to Figure 4.6).

SA developed an extensive stock water supply system over the period 1890 to 1927, largely based on pipe supplies, and bore water supplies.

Some further development of the Irrigation Districts occurred in NSW during the expansion period, and there was continued development of bore water supplies in Queensland, NSW and SA.

(c) Drainage and flood control

Drainage of swamp land was undertaken by the SRWSC and EWSD
as a means of reclamation of land for settlement in the establishment and expansion periods.

Only limited provision was made for flood control retention in water supply storages, and operation of the storages with a view to maximising water supply always proved to be contentious during periods of flooding. Some provision was made in the Wyangla, Glenbawn and Burrendong Dams in NSW. This reflected the need to justify water supply storages in valleys having a history of flooding in terms of flood control. The construction of Wivenhoe Dam on the Brisbane River is a more recent example of a multi-purpose storage. The authorities preferred to construct flood levies as the means of flood control as a more cost effective solution.

Only in the re-politicisation period was there a shift to floodplain management approaches as a basis of control.

(d) River improvement programmes

In the expansion period, the rural water authorities established a number of 'River Improvement' Districts, to enable improvements in the hydraulic capacity and thereby, in water distribution efficiency, of local streams and channels. These programmes took no account of the recreational amenity or ecology of local streams.

(e) Farm water supply

During the expansion period, governments in all states amended legislation to enable the rural water authorities to provide direct assistance to farmers in the development of farm water supplies. These programmes focused on the construction of conservation dams on farms, rather than on reviewing on-farm water utilisation practice.

(f) Rural town water supply & sewerage

Responsibility for the provision of rural town water supply and sewerage has been fragmented and changeable in Victoria and Queensland. The Public Works Department has responsibility for town water supply and sewerage in NSW and the EWSD is primarily responsible in SA.

Substantial growth in the establishment of rural town water supplies occurred in Victoria in the period 1906 to 1921 (refer to Figure 4.10). SRWSC made extensive use of local water supply and sewerage Trusts as the instrument for administering these services, a policy which came under severe criticism during administrative reviews in the late 1970s (2).
FIGURE 4.10 RURAL TOWN WATER SUPPLIES

Rural Population Serviced (%)

SA

Vic

Year

The standard of supply (quantity, quality and reliability) to rural areas has generally been well below that provided for the metropolitan areas, and short of World Health Organisation standards in a number of cases.

4.3 Economic and financial management strategies

4.3.1 Analytical framework

The water industry is one of the most capital intensive of all industries in view of the extensive systems of hydraulic works required to provide services. The capital intensive nature of the works, and the long lead times involved in achieving delivery of services (establishing an income basis, left no alternative to authorities but to borrow to cover capital works in the establishment period.

Economic management of the authorities entails the management of investments and financing in a manner which maximises the return on the investment. In the case of the monopoly, public welfare is maximised where the price is set at the marginal cost of the last unit of production. The nineteenth century concept of municipal trading was one of utilising a market in the generation of a return on investment. One of the arguments for the establishment of statutory authorities independent of government was to take advantage of the benefits of commercial enterprise.

Financial management involves the generation of receipts consistent with recovering the cost of provision of services, and control over expenditure consistent with capital funds available to the authority.

The key management issues are:
- investment policies;
- financing policies;
- revenue raising policies;
- tariff and price setting policies;
- recovering the economic cost of assets policies.

These issues are illustrated in Figure 4.11: Financial management of water authorities.

4.3.2 Analysis of authorities

(a) Metropolitan water authorities

The authorities adopted universally an 'accounting approach' to economic management, with major focus on balancing annual recurrent costs by receipts, and substantial reliance on borrowing to cover the capital works programmes. This reflected a 'service utility' or
FIGURE 4.11 FINANCIAL MANAGEMENT OF WATER AUTHORITIES

Client demands for services & standard expectation

Requirement for augmentation or upgrading of services
- defer
- modify

Capital requirements

Implementation strategies
- modify

Standards of service provision

Capital investment

Government grant

Self financing objective

Borrowing

Developers contributions

Total value of assets

Depreciation & replacement

Operation & maintenance costs

Annual revenue requirement

Interest on loans

Profit objective

Annual revenue requirement

Charge to consumers

Standing charge

Unit charge

Developers contributions

Economic objective

Conservation objective

Equity objective

Administrative objective

Indicator of ability to pay - NAV or UCV

Set rates.

Equity objective

Administrative objective
'service upon demand at cost' perspective which prevailed in the authorities.

Water charges were based on a flat tariff, and no provision was made for depreciation or replacement of assets.

Some innovation occurred in the case of the Sydney Board in the mid-1950s in the adoption of economic criteria guiding investment decisions in the scarce capital climate of the post-War years. The criteria required:
- a 5% return on investment on water supply;
- development only in areas where 90% of the sewerage system was established.

In addition, in 1963, developers were required to make a contribution (Priming Fund) to the cost of trunk service provision. The Melbourne Board adopted developers' charges in 1970.

Evaluation of service augmentation options was based on the least cost project consistent with the prevailing implementation strategy. It appeared that authorities preferred to defer works, relying on water use restrictions or private provision of services, rather than modify standards, review implementation techniques, or adopt pricing as a mechanism for managing demand.

While the authorities had powers to independently undertake borrowing under their statutes, the Loan Council controlled the allocation of loan authorisations in the post-War period. Not until the inflationary and high cost borrowing period of the 1970s did authorities begin to look at self-financing levels and management of borrowing programmes.

The Brisbane City Council incurred a large debt at the time of transfer of the sewerage system from the Brisbane Water Supply and Sewerage Board. The government ultimately cancelled the debt in 1949.

(b) Rural water authorities

The rural water authorities were funded by annual government appropriation with collected revenue paid into consolidated revenue. Charges were set on the basis of recovering the operation and maintenance costs only.

Substantial government intervention in the economic management of rural water supply schemes occurred in all states in terms of:
- provision of 'free national headworks';
- cancellation of rural water supply debts;
- under-valuation of holdings as a means of reducing annual water charges;
.deferment of charges;
.limitation of interest charges on debts.

Governments legitimated this practice on the basis that the indirect benefits of irrigation compensated the loss to government. Charges in the case of SRWSC were assessed at only 44% of the real cost.

In addition, cross subsidisation occurred between urban and rural water supplies in the case of the EWSD, and between irrigation Districts in the case of the SRWSC.

Except for the Keepit Dam project, there was no comprehensive economic analysis undertaken on irrigation projects, projects being selected on the basis of the minimum cost alternative. It is interesting that as late as 1980, the Corporate Plan of the NSW WRC identified provision of water supply at minimum cost as an objective, and that no mention is made of an economic efficiency objective (5).
4.4 Input-output associations

4.4.1 Introduction

What are the principal input-output associations evident from Sections 4.2 and 4.3, and are there exceptions to these associations, or changes in the associations over time? This analysis will provide the basic data for the testing of the hypothesis in the next Chapter.

Before proceeding with this analysis, it is necessary to briefly clarify the policy and implementation category terminology to be used.

(a) Policy area categories:

'Distributive' or 'supply upon demand' type policies comprise the allocation of resources or utilisation of resources in the provision of goods or services upon demand. Distributive policies are appropriate where there are abundant resources to meet all demands, and uses are free of externalities or inter-dependencies. The provision of a safe and reliable water supply upon demand is a classical distributive policy.

'Regulative' type policies comprise controls on activities of individuals or groups to secure conditions reflecting the wider interest, or the provision of conditional services. Regulative policies are appropriate where resources are scarce in respect to the level of demand, or where the externalities of one use have major ramifications for other uses, or where some form of intervention is required to ensure efficient and equitable development and allocation of the remaining resources in the general interest. The adoption of a conditional or restricted water supply is one example of a regulative type policy.

'Re-distributive' type policies comprise actions designed to re-allocate resources across user groups, either by direct government intervention in allocation, or by use of market mechanisms. Re-distributive policies are appropriate where intervention is required to enable a more efficient allocation of resources in the general interest. The current attempts to divorce water rights from title to irrigation blocks to enable trading of water rights is an example of a re-distributive type policy.

(b) Implementation strategy categories

'Development' or 'structural' based strategies involve the physical modification of systems or the environment by the construction of structures in order to provide goods or services having use values.

'Management' orientated or 'non-structural' based
strategies involve the use of administrative, legal, financial and educational means of managing the existing resource and the demands placed upon them, to meet a range of conditions desired by the community.

(c) Implementation technique categories

Implementation techniques comprise the arrangement of works, or administrative, legal, or financial instruments available for the implementation of the adopted strategy, e.g. the construction of dams, distribution systems and treatment works; the adoption of leakage and infiltration control programmes, or improved operational procedures; the use of tariffs and charges as incentives; the use of licences; and the use of regulations and restrictions.

4.4.2 Summary of input-output associations

(a) Metropolitan water authorities

(i) Provision of a safe and reliable water supply as the basis of alleviating urban deprivation, and providing a minimum standard of living.

Generally, a substantial level of attainment of services was achieved, including augmentation to meet prodigious growth in population and home ownership. A dramatic reduction in disease and infant mortality resulted.

In the case of quantity of supply aspects, the principal focus was on structural means of supply rather than on use of charges to foster efficient use of the supply. Not until available water resources were fully exploited did authorities shift to management type approaches. In the case of quality of water supply aspects, closed or restricted catchments (regulative type policies) were adopted as the basis of control in a number of cases. An exception was Brisbane CC, which adopted water treatment from an early date.

Where there was a previous history of severe water pollution, closed or controlled catchment approaches were adopted and prevailed for much of the period of analysis (Melbourne & Sydney). Where reliability of supply (quantity) was the major issue, there was less early and subsequent focus on water quality aspects (Adelaide). Where both reliability and quality were major concerns, special techniques were adopted (Brisbane CC).

Authorities generally raised sufficient revenue to cover costs, although failure to depreciate the assets at their current value represents a transfer of costs to future communities.
Systems of rates were adopted as the basis of cost recovery, but the systems were administered in a form which maximised the dependability of income (flat rates on property values) rather than reflect an equity (pay by use) principle.

Generally, the development of services was based on structural solutions, with the adoption of the least cost means of augmentation consistent with the prevailing implementation technique (e.g. regulation and transfer of streamflow within closed catchments), until such time as further implementation of the prevailing technique was no longer viable.

While considerable human resources were invested in the forecasting of growth in demand and in programming of augmentation of services, the commitment to new works was almost invariably associated with the occurrence of a drought.

The design of systems was based on the driest on record year, yet restrictions were applied for some 60% of the period of analysis. There was no formal incorporation of restrictions into the design or risk analysis for programming purposes. Restrictions were simply perceived as a device to manage an aberration in the system.

There was a considerable investment in improved reliability and standard of supply over the period of analysis. Given the absence of consumer surveys, it is concluded that these rising standards were driven by professional ambition rather than by consumer demand. There was little involvement of consumers in evaluating the performance of authorities in the provision of services until the late 1970s. Consumer complaints were used by groups as the basis for justifying the upgrading of services.

Except in the case of the EWS D, there was little utilisation of reclaimed wastewater practiced.

Generally, authorities demonstrated a single function approach to the development of services, with little attention given to opportunities for multi-purpose use. Brisbane CC policies represented an exception to this rule, in view of the acceptance of recreational use of the North Pine Reservoir in 1979.

Areas of significant shifts in implementation techniques included adoption of:
- mechanised construction techniques in the post-War years;
- theoretical design techniques in the 1970s;
- process based water treatment technologies in the 1970s;
- a system based approach to operations in the 1980s.
In situations of scarce capital funds, implementation of works required for the augmentation of services were simply deferred. No consideration appears to have been given to the adoption of alternative management strategies.

While authorities generally operated within their statutory jurisdiction, they frequently negotiated their functional boundaries in areas of primary concern. Examples are the negotiation for the extension to service areas in the case of Sydney, negotiation of bulk water supply to outside authorities in the case of Brisbane, negotiations to limit development areas in the case of Sydney, and negotiation with government to amend water legislation in the case of the EWSD.

(ii) Provision of an adequate sanitation system as the basis of alleviation of urban deprivation and provision of a minimum standard of living.

Generally, the authorities attempted to provide services upon demand, but experienced extensive periods of shortfall in the provision of sanitation services as compared to water supply, particularly in the case of Brisbane and Adelaide. All of the metropolitan areas suffered a backlog in the provision of services in the 1960-70 period.

Generally, the provision of services was based on structural strategies (system of collecting sewers, outfall trunk sewers, and treatment and disposal facility) of supply upon demand. Exceptions to this pattern included the use of night soil collection in Brisbane well into the 1960s, the use of septic tanks in Melbourne and Adelaide during the 1960s and early 1970s, and attempts by Sydney and Adelaide to limit the development areas to serviced areas during the 1960s.

A shift away from a development orientated approach to a management orientated approach occurred in the early 1980s, with the upgrading of sewer infiltration controls and replacement programmes, and the adoption of trade waste standards and charges.

Initially, ocean outfalls or sewage farms were adopted as the basis of sewage disposal. Subsequent servicing was limited to extension of the sewerage collection network until the late 1960s and early 1970s, resulting in gross overload of the early disposal facilities. An exception to this pattern was the requirement by the Melbourne Board for developers to provide temporary package treatment plants pending the completion of major sewage plant augmentation.

Major pollution occurred in the 1960s and early 1970s as a result of:
the extent of the backlog in the provision of services;
the extent of spillage from overloaded facilities;
the inadequate level of wastewater treatment.

This placed the authorities (especially Sydney & Brisbane) in the position of major polluters of the environment, i.e. the major cause of the very problem they were established to resolve.

During the 1970-80 period, there was a significant improvement in the level of provision of sewerage services, the standard of treatment plants and ocean outfalls, and in the level of industrial waste connections.

Until the 1970s, wastewater treatment was largely biologically based, with low levels of technology and operations management input. The programme of sewage treatment upgrading in the 1970s involved a shift away from sewage farm based solutions to the adoption of process technologies. An exception was the continued operation of the Werribee Farm by the Melbourne Board.

(iii) Provision of a (main) drainage system as the basis of improved urban amenity and the protection of life and property.

Authorities again adopted a structural approach to the provision of services with the imposition of classical engineering structures to collect and transfer stormwater out of the urban areas. There was a shift from large concrete channel structures to the use of retardation basins in the early 1970s.

The provision of these services was generally given a low priority, with commitment dependent on the utilisation of unemployment relief, construction in association with freeways, or flood events.

Regulative type policies were utilised by the Melbourne Board in respect to flood management in the Yarra River valley. The Brisbane CC on the other hand, failed to use its planning powers to limit development in the Brisbane River valley, necessitating the adoption of a structural solution (Wivenhoe Dam flood regulation scheme) following the 1974 flood.
(iv) Provision of water based and associated recreational facilities in association with water supply facilities, as the basis for the enhancement of quality of life.

Generally, the authorities pursued narrow objectives related to the provision of specific (water supply) services in isolation from other factors. An exception was the adoption of water based recreation by the Brisbane CC on the North Pine Reservoir in 1979. Authorities frequently provided picnic facilities downstream of major water supply dams as a means of drawing attention to prestigious structures constructed by the authority.

(b) Rural water authorities

(i) Development and administration of irrigation areas, and provision of irrigation water supply, as the basis for ameliorating social and economic deprivation in rural areas, and for fostering closer settlement as a basis for economic growth in rural areas.

Early irrigation development was undertaken in the absence of demonstrated demand for blocks. Authorities were obliged to undertake immigration programmes to attract settlers to take up the blocks.

The authorities demonstrated a poor performance in the areas of agronomy, marketing, irrigation practice, and administration of settlers. Authorities experienced early loss of responsibility for the administration and settlement functions, and a shift to a primary focus on the supply and distribution of water. The authorities continued to perform poorly in areas of extension work and research on water application technology or use efficiency.

Despite the early emphasis in Victoria on irrigation implementation based solely on intensive agriculture, there was an early shift to acceptance of extensive (pasture & stock) irrigation water supply. The second pillar of 'successful irrigation implementation' in Victoria was that of compulsory payment for water rights. This principle was significantly diluted by substantial subsidisation by governments of operating costs.

However, the irrigation authorities did adopt a system of conditional water rights (regulative type policy) which adjusted annual water entitlements to irrigators in the light of the condition of storages at the commencement of each irrigation season.

There was substantial intervention by governments in financial management, in terms of writing-off irrigator
debts, writing-down the value of blocks, and the provision of 'free national headworks'. This intervention was legitimated on the basis of a fair return on the settler's investment and ability to pay (protection of a minimum standard of living). Exceptions to this pattern comprised the attempt in a number of cases to amalgamate blocks, and private development of irrigation in Queensland.

There was a failure to anticipate salinity problems, and to appreciate the wider system implications of local provision of drainage with returns to the river.

Irrigation water supply was based largely on surface water regulation, with application by flood irrigation in Victoria and NSW, and by spray irrigation in SA and Queensland. Extensive use (58%) of groundwater occurred in the case of Queensland.

Projects were selected on the least cost alternative consistent with the prevailing implementation technique. There was no attempt to justify the projects on comprehensive economic analysis or to undertake comprehensive environmental analysis until the late 1970s. In situations of scarce capital funds, water supply augmentation projects were simply deferred rather than shift to alternative implementation strategies.

The system of licences was adopted primarily as a means of raising revenue, rather than as a regulative instrument in controlling utilisation up until the late 1970s. Means of separating water rights from block entitlement, to enable transfer (re-distribution) of water allocations in the interests of improved economy, is currently being pursued in Victoria.

There was rapid growth in the provision of water storages in the 1960s and 1970s in NSW and Queensland, well in advance of any demonstrated water demand. However, publicly funded irrigation developments virtually ceased beyond the late 1960s.

Generally, authorities were strong on distributive type policies and structural strategies, and weak on regulative or management orientated approaches up until the mid-1970s. Programmes of progressive upgrading of channels to reduce leakage losses (50% loss of supply in distribution channels) were implemented in the 1960s and 1970s in Victoria and NSW.

The major focus of water supply authorities was on quantity rather than on quality of water supply.

(ii) Provision of stock and domestic water supply as the basis for alleviating social and economic
deprivation in rural areas, and for fostering rural
growth and prosperity.

The early establishment (pre-1900s) of stock and
domestic water supplies were based on bore water supplies
in Queensland, NSW and SA, and on channel systems in
Victoria. In the 1910s and 1920s, irrigation distribution
systems incorporated provision (extensive irrigation) for
stock and domestic water supplies. Extensive development of
rural water supply pipelines occurred in SA.

(iii) Provision of rural town water supply and sewerage
systems as the basis for providing an improved
standard of living.

The principal focus of water authorities was on quantity
of water supply aspects rather than quality aspects, and on
bulk water supply rather than on local details of service
provision.

Restricted supplies were adopted in a number of cases in
view of the uneconomic nature of supply to small
communities. These services were highly subsidised by
government.

(iv) Provision of 'on-farm water supply' assistance as a
basis of fostering rural growth and prosperity, and
as a symbol of government concern for the rural
electorate.

Again, the major focus of water authorities was on the
structural aspects of on-farm dams, rather than on
providing an overall review of on-farm water utilisation
practice and efficiency.

(v) Provision of drainage and flood control, as a basis
of alleviating social and economic deprivation of
flood prone rural areas.

Drainage and flood controls were based based on
construction of levees, or on the incorporation of flood
storage provision in new dams where support for projects
was dependent on the provision of some flood protection.
Little attention was given to regulative type controls on
development in flood plains until the 1970s.

(vii) Exploitation of natural resources as the basis of
fostering economic growth.

There was incorporation of hydro-generation facilities into
a number of irrigation dams, but generally major
hydro-generation developments were undertaken by electricity authorities (Kiewa Scheme by the State Electricity Authority in Victoria, and the Snowy Scheme by the Snowy Mountains Hydro-Electric Authority for the Commonwealth).

Authorities promoted the construction of large water conservation storages on the basis of national development benefits, without any rigorous economic analysis to substantiate the claims, and even after the decline in irrigation development in the 1960s. Authorities utilised resource assessment reports and identification of possible conservation projects as the means of incorporating projects into the political agenda.

Governments utilised the EWSD and Old WRC to undertake directly the provision of industrial and mining water supplies.

(c) General management and implementation practices

(i) Management and allocation of water resources vested in the Crown in the interests of economic growth and community well being.

The approach adopted to the planning and management of water resources has varied over the period of analysis, as summarised in the following table.

<table>
<thead>
<tr>
<th>Period</th>
<th>Major political focus</th>
<th>Level of water utilisation</th>
<th>Allocation &amp; implementat. strategies</th>
</tr>
</thead>
<tbody>
<tr>
<td>Establ.</td>
<td>Alleviation of social deprivation and provision of a minimum standard of living.</td>
<td>Low to high</td>
<td>Distributive &amp; development or structural strategies.</td>
</tr>
<tr>
<td>Re-polit.</td>
<td>Broad social goals, with emphasis on improved economic efficiency, and quality of life.</td>
<td></td>
<td>Gradual shift to regulative &amp; management strategies.</td>
</tr>
</tbody>
</table>

The major focus of water administration throughout the
establishment and expansion period was on development, with little consideration of regulatory type policies, diversion licence control, restriction policies and pricing. The allocation and development of rural water resources up until the mid-1970s was based on the promotion of irrigation and stock water supplies, notwithstanding the decline in growth in these sectors. In the face of scarce remaining unallocated resources in the 1970s, there was a shift to wider planning analysis and management orientations, and to closer scrutiny of licence conditions. Water plans emerged in the 1980s as an instrument for comprehensive and systematic planning, development and management of resources.

(ii) Utilisation of science and technology as a basis for improved efficiency in the provision of services, and demonstration of the technical expertise of the authority.

Generally, the use of science and technology has been limited to tasks directly related to the implementation of prevailing techniques, and for substantiating the efficacy of the techniques.

The construction groups quickly adopted new equipment in the post-War period, and have been at the forefront of new equipment and construction technique development. The design groups were more resistant to new technologies, until the empirical engineers were displaced by engineers trained in the theoretical approaches evolving in the mid to late-1950s. The operation and maintenance groups presented the areas most resistant to change. The traditional empirical and craft-type approaches to operations prevailed until the enormous scale and complexity of systems forced a change in the early 1970s.

The advent of process type water treatment systems, and pollution control requirements in the mid-1970s, injected new science and technology based groups into the authorities.
### Table 4.2 (a) Summary of outputs: Metropolitan water authorities

<table>
<thead>
<tr>
<th>Output</th>
<th>Est. Exp. ReP.</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Substantial provision of services upon demand.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- water supply</td>
<td>/ / /</td>
<td>Poor provision of sewer-age in 1960-75 period.</td>
</tr>
<tr>
<td>- sewerage</td>
<td>/ x /</td>
<td>Low priority to flood protection &amp; recreation.</td>
</tr>
<tr>
<td>- drainage &amp; flood protection</td>
<td>x x x</td>
<td>Exception Br.CC on Pine Dam in 1970s.</td>
</tr>
<tr>
<td>- recreation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Principal focus on structural solutions (distributive policy, service upon demand) to social needs and political issues.</td>
<td>/ / x</td>
<td>Particularly applicable to quantity aspects but not quality aspects of supply. Syd HWS&amp;DB &amp; EWSD attempted to influence pattern of urban development in the 1960s &amp; 70s. Br.CC maintained system of night-soil collection well into 1960s. MMBW &amp; EWSD adopted septic tanks as basis of sanitation in 1960s. While all authorities utilised w.s. restrictions as the basis of supply during drought, restrictions never formally incorporated as basis of design.</td>
</tr>
<tr>
<td>Adherence to established service implementation techniques until such time as resources no longer available.</td>
<td>/ / x</td>
<td>EWSD adopted a range of water harvesting strategies. Sewerage groups adopted a range of alternative techniques.</td>
</tr>
<tr>
<td>Commitment of new works as a response to environmental or political issues rather than to systematic planning.</td>
<td>/ / /</td>
<td></td>
</tr>
<tr>
<td>Substantial improvement in standard of services in response to professional ambition rather than consumer demands.</td>
<td>- / /</td>
<td>Adoption of performance criteria and monitoring in 1980s.</td>
</tr>
</tbody>
</table>

Notes: / significant response during the period
- mixed response during the period
x limited or no response during the period
### Table 4.2 (b) Summary of outputs: Rural water authorities

<table>
<thead>
<tr>
<th>Output</th>
<th>Est. Exp. ReP.</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Substantial provision of services upon demand.</td>
<td></td>
<td>Provision of irrigation w.s. well in advance of demonstrated demand.</td>
</tr>
<tr>
<td>- irrigation water supply</td>
<td>x x /</td>
<td>Low priority to flood protection &amp; recreation.</td>
</tr>
<tr>
<td>- flood control</td>
<td></td>
<td>Poor provision of rural town w.s. &amp; sewerage services. Exception EWSD.</td>
</tr>
<tr>
<td>- recreation</td>
<td></td>
<td>Particularly applicable to quantity aspects but not quality aspects of supply. WICIC &amp; SR&amp;WSC undertook channel leakage control in late 1960s. Shift to more rigorous diversion licencing and control in the 1970s. Undertook floodplain mapping and controls in late 70s. Rural water authorities adopted a sliding water allocation criteria, with each seasons allocation based on level of reservoirs at the commencement of the irrigation season. Shift to planning and management approach in late 1970s.</td>
</tr>
<tr>
<td>- rural town water supply</td>
<td></td>
<td>Particularly so in the case of irrigation water supply storages.</td>
</tr>
<tr>
<td>Principal focus on structural solutions (distribution policy, service upon demand) to social needs and political issues.</td>
<td>/ / x</td>
<td>Adherence to established service implementation techniques until such time as resources no longer available.</td>
</tr>
<tr>
<td>Adherence to established service implementation techniques until such time as resources no longer available.</td>
<td>/ / x</td>
<td>Irrigation w.s. in Qld based on both surface and groundwater sources.</td>
</tr>
<tr>
<td>Commitment of new works as a response to environmental or political issues rather than to systematic planning.</td>
<td>/ / /</td>
<td>Notes: / significant response during the period - mixed response during the period x limited or no response during the period</td>
</tr>
</tbody>
</table>
Table 4.2 (b) Summary of outputs: Rural water authorities

<table>
<thead>
<tr>
<th>Output</th>
<th>Est.</th>
<th>Exp.</th>
<th>ReP.</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Substantial improvement in standard of services in response to professional ambition rather than consumer demands.</td>
<td></td>
<td></td>
<td></td>
<td>Rapid development of dams in the 1960s &amp; 70s despite a decline in irrigation.</td>
</tr>
<tr>
<td>Single utility function as the basis of efficient provision of services</td>
<td></td>
<td></td>
<td></td>
<td>Frequent conflict between irrigation, flood protection functions, incorporation of hydro-electric generation on some dams, but operation secondary to w.s. Tolerated recreational use of reservoirs. Failure to anticipate salinity problems &amp; mgmt. Poor performance in the areas of farm agriculture and water utilisation extension work. Under challenge from the environmental lobby in the 70s, authorities defended projects on the basis of their multiple functions.</td>
</tr>
<tr>
<td>Financial management limited to accounting functions, with subsidisation by governments of projects.</td>
<td></td>
<td></td>
<td></td>
<td>Shift to a more rigorous economic analysis, and user-pays principle, in the late 1970s.</td>
</tr>
<tr>
<td>Adoption of advances in technology and theoretical knowledge.</td>
<td></td>
<td></td>
<td></td>
<td>Rapid adoption of new equipment by construction groups in post-War period Adoption of theoretical approaches to design in early 60s. Adoption of systems based approach to operations in late 70s.</td>
</tr>
</tbody>
</table>

Notes: / significant response during the period  
- mixed response during the period  
x limited or no response during the period
4.5 References

5. INTERNAL PROCESSES AND EXPLANATORY ANALYSIS

5.1 Introduction

Chapter 2 considered the range of social, economic and political factors which contributed to the establishment of authorities having specific statutory responsibilities. Chapter 3 undertook an analysis of the operating environment of the authorities in respect to:

- the available political, client and professional areas of support;
- the prevailing perspectives regarding the role of government; and
- the physical, financial and administrative resources available to the authorities.

Chapter 4 analysed the nature of authority outputs over the three periods of analysis and the patterns of input-output associations evident in the data.

What are the similarities and differences between authorities in respect to their input-output associations, and what do these similarities and differences tell us about the nature of internal processes? What is the role of formative factors in this process?

Before addressing these questions, it is necessary to develop the hypothesis in respect to the components of the internal processes of resource allocation. The internal processes comprise five sub-categories, as follows:

- the perceived primary tasks facing the organisation;
- the differentiation of tasks and mechanisms of control and co-ordination;
- the development of internal sources of legitimation within the sub-culture of the organisation;
- the process of negotiation of legitimation claims to scarce organisational resources;
- the allocation of resources to the successful (dominant) groups, yielding organisation outputs which reflect the interests of those groups.

5.2 Perceived primary tasks

As noted in Chapter 2, the perceived primary tasks are a reflection of the factors underlying the establishment of the organisation which are implicit in the adopted implementation strategies and statutory functions. These perspectives may be modified over time in response to operating experience or a changing external environment.

In the case of the urban water organisations, the primary goal was the alleviation of social deprivation as a result of rampant disease. The strategy adopted as the principal
mechanism for improvement in public health, was the provision of a reliable and unpolluted water supply, and improvement in sanitation and drainage.

Consequently, the primary tasks were:
- the regulation and diversion of streams free of pollution for urban water supply;
- the provision of storages of a size ensuring the maintenance of supply over drought periods;
- the provision of a distribution system for the delivery of water to individual blocks;
- the provision of a system of sewers capable of collecting and removing domestic and industrial waste from the urban areas;
- the development of trunk sewers in association with a sewage farm or ocean outfall to dispose of collected wastes.

It was assumed that the effective implementation of these tasks would ensure the attainment of the underlying social goals. The primary focus of the organisation was therefore on the technical implementation of works associated with the provision of these services.

A number of local concerns occurred which had ramifications for particular organisations. Both Melbourne and Brisbane had had a long history of highly polluted water, such that water quality represented an important requirement in the eye of the public. In the cases of Sydney and Adelaide, reliable supply was more critical, while in the case of Brisbane, reliable supply was equally critical.

The Sydney, Melbourne and Adelaide organisations faced considerable local government animosity, in view of the previous involvement of local government in the provision of water supply. The representation of local government on the Boards in Sydney and Melbourne were attempts to address this issue. However, the organisations were under critical scrutiny in respect to their technical and administrative competence, their effectiveness in the provision of services, and their compliance with the principles of equity and fairness in allocation of charges. Consequently, these were performance areas critical to the survival or the organisations. Brisbane on the other hand faced animosity from government departments, fuelled by political conflicts between state and municipal governments.

In the case of the rural water supply organisations, the primary goals underlying the establishment of the organisation were the promotion of rural prosperity and well being, by means of the promotion of growth, and amelioration of the impact of droughts. The adopted strategies underlying the establishment of the organisations comprised the promotion of closer settlement by means of irrigation development, and the provision of a
reliable system of water supply.

The primary tasks confronting the organisations were:
- the establishment and reticulation of irrigation blocks by Government;
- the provision of headworks having sufficient capacity to maintain a reliable supply of water;
- the provision of initial subsidisation to promote growth to the point where it would become self-sustaining.

As in the case of the urban organisations, it was assumed that effective implementation of these tasks would ensure attainment of the underlying goals. Primary focus was therefore on the task of technical implementation. Failure to secure the goals was interpreted as failure or inefficiency in the tasks of implementation rather than inappropriateness of the underlying implementation strategy.

The major concern confronting organisations in respect to town water supplies was the reliability of supply. Consequently, focus was on the provision of storage capable of maintaining supply during drought periods.

The perceived primary tasks of the organisations were modified during the period as a result of the delegation of additional functions to the organisations by governments.

Both the Sydney and Melbourne Boards had main drainage added to their responsibilities during the mid 1920s. Initially, the NSW organisations had responsibility for the operation and administration of works only, the construction responsibility being vested in the Public Works Department. The Sydney Board finally wrested responsibility for construction from the Public Works Department in 1927. However, the Board continued to utilise the Department as its construction agent until 1940. Consequently, the administrative focus of the NSW organisations was unencumbered by the contingencies of construction activities.

The rural water supply organisations divested several functions during the period. The SRWSC withdrew from responsibility for the sub-division and reticulation, and settlement of irrigation Districts, to a more limited water supply role. The WCIC withdrew from its direct responsibility for the administration of irrigation Districts and responsibility for provision of Local Government type services. Both organisations combined with the Agriculture Departments within their respective States, to undertake research into irrigated cultures.
5.3 Differentiation of tasks and control of organisations

5.3.1 Introduction

The differentiation of tasks and establishment of functional groups is initially a response to the perceived primary tasks facing the organisation and the underlying implementation strategies. Thereafter, the position of functional groups will be determined primarily by their access to sources of legitimation, unless the organisation accepts the need to redefine its primary tasks and implementation strategies.

Durkheim noted that the division of labour leads to differentiation of occupation and specialisation. The situation of differentiation requires some means of integration of individual activities in the interests of the collective action required for the provision of services, i.e. some system of control over individual activities is required.

The four major modes of control utilised by the organisations examined in this thesis are executive, bureaucratic, professional and technological authority. Executive authority comprises the direct intervention of the executive in processes of resource allocation and production, bureaucratic authority comprises the rules and procedures for undertaking routine tasks, professionalism comprises the application of specialist knowledge to problems, and technological authority comprises the application of actions or tasks dictated by the adopted technique.

Within these four broad modes of control, organisations may be structured on the basis of product, function, geographic area or client. The organisations analysed in this thesis were structured on functional lines, with separation of technical tasks from the administrative tasks during the establishment and expansion periods (refer to Figures 3.5 & 5.1).

During the re-politicisation period the organisations integrated the operations of services on a regional basis. The EWDS completely restructured its organisation, with the relegation of design and construction areas to service groups, and elevation of the corporate and resource planning areas to the executive level (refer to Figure 5.2).

What are the legitimation sources of authority for each of the above modes of control? What is the nature of the technical rationality and associated knowledge constitutive interests which each brings to bear, and what are the organisational structure and control implications of each?
FIGURE 5.1 (a) TYPICAL ORGANISATION STRUCTURE OF METROPOLITAN WATER AUTHORITIES: EXPANSION PERIOD

President or Chairman

<table>
<thead>
<tr>
<th>Secretary</th>
<th>Engineer-in-Chief</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>Legal Staff</td>
<td>Water Supply</td>
</tr>
<tr>
<td>Treas.</td>
<td>Drain Design</td>
</tr>
<tr>
<td>Assess</td>
<td>Mech Operat.</td>
</tr>
<tr>
<td>Stores</td>
<td>&amp; Elec.</td>
</tr>
<tr>
<td>&amp;</td>
<td>Surv.</td>
</tr>
<tr>
<td>Accts Receiv.</td>
<td>Sewer Design</td>
</tr>
<tr>
<td></td>
<td>Constr</td>
</tr>
<tr>
<td></td>
<td>Scient Labs</td>
</tr>
<tr>
<td></td>
<td>Water</td>
</tr>
</tbody>
</table>

FIGURE 5.1 (b) TYPICAL ORGANISATION STRUCTURE OF RURAL WATER AUTHORITIES: EXPANSION PERIOD

Commissioner

<table>
<thead>
<tr>
<th>Secretary</th>
<th>Chief Engineer</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>Prop. Staff</td>
<td>Dam</td>
</tr>
<tr>
<td>Treas.</td>
<td>Invest</td>
</tr>
<tr>
<td>Valuat</td>
<td>Mech</td>
</tr>
<tr>
<td>Stores</td>
<td>Surv.</td>
</tr>
<tr>
<td>&amp;</td>
<td>Rural</td>
</tr>
<tr>
<td>Accts</td>
<td>Town</td>
</tr>
<tr>
<td>&amp;</td>
<td>W.S.</td>
</tr>
<tr>
<td></td>
<td>Irrig</td>
</tr>
<tr>
<td></td>
<td>Constr</td>
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<tr>
<td></td>
<td>Operat.</td>
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<td>&amp;</td>
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<tr>
<td></td>
<td>Drain</td>
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<tr>
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<td>Design</td>
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<tr>
<td></td>
<td>&amp;</td>
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<tr>
<td></td>
<td>Mtce</td>
</tr>
<tr>
<td></td>
<td>Rivers</td>
</tr>
<tr>
<td></td>
<td>Irrig</td>
</tr>
<tr>
<td></td>
<td>W.S.</td>
</tr>
<tr>
<td>&amp;</td>
<td>Flood</td>
</tr>
<tr>
<td>Areas</td>
<td>Farm</td>
</tr>
<tr>
<td></td>
<td>Irrig</td>
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<td>Contr</td>
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<tr>
<td></td>
<td>w.s.</td>
</tr>
<tr>
<td></td>
<td>Foresh</td>
</tr>
<tr>
<td></td>
<td>Distr</td>
</tr>
</tbody>
</table>
FIGURE 5.2 ORGANISATION STRUCTURE OF EWSD: RE-POLITICISATION PERIOD

Director
  +-----------------+-----------------+-----------------+-----------------+-----------------+
  | Director        | Director        | Director        | Director        |
  | Planning        | Management      | Operations      | Services        |
  +-----------------+-----------------+-----------------+-----------------+
  | Corp Fin W.Res  | Metrop Regional |                 |
  | Plan Plan Plan  | Services Services|                 |
  +-----------------+-----------------+-----------------+
  | Staff Indust    | Design Constr   |                 |
  | Safety ADP Relat| Survey Operats  |                 |
  |                 | services        |                 |
5.3.2 Executive authority mode

(a) Theoretical framework

Section 1.2 introduced Habermas's concept of the state as an administrative system, seeking to intervene in the production system to maximise use values, and to skim off some surplus value for social welfare allocation. Dependent on the rightness or correctness of its actions, and the nature of the rewards it offers to the community, the administrative system derives the mass loyalty and support necessary to sustain its authority.

While the focus of Habermas's model is on state action, it is equally applicable to organisation administration in which a number of groups are competing for limited resources, and the authority of the executive to intervene in this process is constrained by its need to sustain support. The executive draws on the universal values and norms, and on participation of organisation groups in the policy formulation process as the basis of substantiating their rightness or correctness. Outputs from the executive comprise the steering of the production system and intervention in the system of allocation of available resources between groups.

The level of mass loyalty accruing to the executive will depend on the perceived legitimacy of its administrative actions, and the rewards it offers to organisation members.

(b) Analysis of organisations

The statutes creating the organisations examined in this thesis delegated authority to the Boards in the case of public corporations, and to a Commissioner or Commissioners in the case of the departmental corporations. However, authority is delegated on the basis of effective administration in the provision of services required under the statutes. Consequently, the internal application of executive authority is constrained by the level of legitimacy that the executive is able to sustain.

Where there is an outside threat to the organisation as a whole, then individuals and groups relegate their interests to the executive in the wider interest of survival. Where the executive is able to secure additional resources or opportunities for growth by negotiation in the external environment, then its legitimacy will be enhanced.

The level of antagonism confronted by the Sydney Board, its effectiveness in negotiating extensions to the Board's service area, and the limitation of the size of the Board were all important factors engendering a strong internal
role for the Board in the establishment and expansion periods. Upton considered that the Board was akin to a Board of Directors of commercial undertakings, bringing to bear their collective expertise on Board policy and financial directions of the organisation. (1)

Where on the other hand, the organisation experiences a placid environment, or the executive is ineffective in sustaining an equitable share of government loan or budget appropriation, its ability to influence internal processes will be diminished. The high level of community support for the Melbourne Board well into the expansion period, and the unwieldy size of the Board, were factors limiting the corporate role of the Board in steering the organisation.

In the terms of the hypothesis then, the executive is just one more internal group, drawing on available sources of legitimation to secure its authority and influence, e.g. a PA Review of the SRWSC in 1981 noted that an attitude of cynicism existed towards Corporate Planning. (2)

In the establishment period, administration and technical knowledge resided at the top, thereby enhancing the authority of the executive. By separating the financial area from the technical area, the executives were able to retain control over expenditure and to require justification of projects by the technical groups. The cost of this direct control over projects was substantial involvement of the executive in the technical decisions instead of a focus on broader corporate management issues.

Through the expansion period, the heads of statutory authorities had considerable influence over state programmes, and thereby, considerable influence within their own organisations.

In the re-politicisation period, as a result of specialisation, technical and administrative knowledge resided within the specialist groups within the organisation. Consequently, where the executive intervened in these areas, it needed to be able to demonstrate the logic of requirements in order to maintain credibility and support. Alternatively, the executive may adopt the role of final arbiter in a 'divide and rule' type environment, or a facilitator in a consensus style of management.

The sheer scale and complexity of programmes in this period was beyond the ability of part-time Board members or single Commissioners to encompass. With the exception of the EWSD, the organisations lacked the internal perspectives to adapt to the new needs. By the 1960s, the visibility of the water resource crisis in SA was such that moves to adapt management and legislation received strong internal and government support.
Policies regarding recruitment, training and promotion have an important bearing on the status of the executive. Where technical group are dominant with limited rotation of staff, as in the case of the organisations examined in this thesis, there is little perception of the wider corporate needs, and hence loyalty tends to be directed to the groups.

In the situation of a strong development ethos, with strong support available to design and construction groups externally, the executive is locked into supporting development programmes.

5.3.3 Bureaucratic mode

(a) Theoretical framework

Weber formulated seven propositions describing rational legal authority (3) as follows:-
- the functions of office are clearly specified;
- there is a clear hierarchy of offices;
- obedience is to the office and not to the individual;
- officers are expert and salaried;
- the office holder cannot appropriate his office;
- administration is based on written records;
- rules are impersonal and universal.

Weber claimed that a belief in legitimacy was basic to all systems of authority. The legitimacy of the rational legal system of authority derived from its superior efficiency and its dependance on abstract laws enacted by proper procedures. Habermas observes that Weber's primary concern was with the ability of an order to generate a belief in its legitimacy, not in the truth or falsity of the beliefs themselves. (4)

Organisation members accept that the organisation has the authority to require certain patterns of behaviour in the collective interest. Members relegate their individual rights in exchange for membership of the organisation, status and salary.

Bureaucratic rationality comprises the pre-formulation of a series of means-ends actions based on efficiency criteria and relations of authority of the day. There is an assumption that the effectiveness of the organisation will be guaranteed by the reliable performance of the rules and procedures prescribing the tasks. The focus of control is therefore one of ensuring compliance with the rules and procedures, rather than monitoring the continued appropriateness of the pre-formulated means-ends actions.

Merton observed the tendency within many bureaucracies for over emphasis on compliance with rules and procedures, even
when those rules and procedures were no longer appropriate, i.e. the means become an end in themselves. (5)

Simon introduced the concept of limited rationality or satisficing levels of decision making, i.e. the fulfillment of the task in the interests of overall organisational viability is more important than the efficient implementation of the task. (6)

The 'legitimation of bureaucratic authority' demands compliance with the following imperatives:-
- the concept of law as a system of impersonal and universal rules (image of impartiality);
- that obedience is to the impersonal order and rules rather than to the person (acceptance of hierarchical authority of formal positions);
- that orders and rules are based on legal functions and duties;
- that services are undertaken in accordance with the law.

The knowledge constitutive interests of personnel are in maintaining the conditions under which faithful performance of the prescribed procedures will yield the desired goal and in sustaining programmes which enable the application and expansion of their particular knowledge and skills.

The basis of interaction or structural implications of this mode of control is a hierarchical system of authority with obedience to the position. The components of control comprise:
- the principle of obedience to impersonal orders and rules;
- the legal right of those in authority to issue orders.

Internalisation of the organisation's perspectives, norms, values, roles and language (the major premise from which appropriate actions may be deduced) is fostered through a process of:-
- recruitment of officers with the appropriate values and perspectives;
- in-house training to establish a consciousness of the formal organisation expectations and procedures;
- the use of rewards and sanctions;
- in-house socialisation within a committed body of personnel to foster loyalty and allegiance of the individual to the functional group.

Assessment of performance is based on demonstrated knowledge of and compliance with both formal and informal rules. In view of the routine nature of tasks covered by this mode (lack of contingencies), it is the area most prone to institutionalisation.
(b) Analysis of organisations

All of the organisations embraced a substantial level of bureaucratic mode of differentiation of tasks and control. The groups covered by the bureaucratic mode of control comprised the routinised clerical, administrative, accounting, assessing and stores tasks.

All of the organisations were based on a hierarchical structure based on functions, with separation of the technical and the administrative areas (refer to Figures 3.5, 5.1 & 5.2).

The strict separation between the Engineer-in-Chief's area and the Secretary's area reflected the autonomy of the technical areas ultimately wrested from elected officials in the English Special Purpose Authorities in the nineteenth century.

Encel suggests that egalitarianism induced a hostility towards aristocracy, authority and privilege. The conflict between 'anti-intellectualism' and the 'special knowledge' needs of industrial society was resolved by elevating the practical expert rather than the intellectual (7). Hence, administration was largely limited to such technical activities as accounting and book-keeping, stores inventories, rates assessment and receiving, inspection, etc.

In view of the scarcity of educated and trained personnel available in the establishment period, it is probable that codified rules and procedures formed a crucial means of effecting works, even in the technical areas. In undertaking interviews within the organisations, the importance of developing an understanding of the Commission's or Board's view was frequently stressed. The Commission's or Board's view entailed both formalised and unwritten rules and procedures which were inculcated over a period of service within the organisations. The establishment period was characterised by numerous Royal Commissions and Enquiries into the administrative and technical competency of the authorities.

The hegemony of the technical areas and the routine nature of administrative work were factors limiting the evolution of wider administrative perspectives within the organisations. Two exceptions to this view are the Sydney Board, where a strong and able group of appointed officials maintained an overview of the directions and management of the organisation; and more recently, the EWSD, where as a result of emerging constraints (limited availability of resources), traditional approaches to the development and management of resources were no longer viable.

Upton provides a valuable record of the management attitudes and procedures prevailing within the Sydney Board.
in the 1930s and 40s. Control of the Board's activities was provided through control over funding of works, and the surveillance of accounts. Upton considered that the principles upon which organisation should be based were:

- efficient chains of command;
- clear hierarchy of responsibility;
- clearly designated fields of responsibility;
- encouragement of officers to give their maximum.

Upton also stressed the importance of unquestioned acceptance of expert advice, participation in decision making, and tact in the administration of subordinates. (8, 9)

Byham notes that administration of irrigation areas in Victoria in the 1930s comprised two components; the technical operation of water distribution, drainage, flood control and channel and river maintenance; and the financial and administrative functions, including the determination of charges and water deliveries, and the collection of revenue. (10)

Byham notes that the role of the water Bailiff does not require a high level of education or technical knowledge, but rather a high degree of tact, industry and good humour, an above all, a good 'water sense'. (11)

The expansion period was characterised by extensive use by governments of Parliamentary Public Works Committees to review capital works programmes. Given the increased scope of works, project management emerged in the 1950s and 60s as a major management tool. There was also a fourfold increase in the size of most authorities in this period (refer to Figures 5.3 & 5.4).

Robertson wrote in 1968, that in view of the Melbourne Board's task, the organisation is structured on the basis of the primary functions for which it was established. Growth in the administrative and financial services is the result of heavy demands from the technical areas. The Board is in essence, a classical Weberian bureaucracy, but at the same time, exhibits extensive inter-relations at an informal level. Its goals are the attainment of high standards, maximum efficiency, and minimum maintenance costs. (12)

As noted previously, the 1970s was a period of major administration review in all states except Queensland. The focus of administrative reforms was on more responsive and better co-ordinated administration across the various levels of government. The EWSD collaborated with government in developing new comprehensive water resources legislation (Water Resources Act 1976) appropriate to SA in the 1970s and 80s, and implemented a major programme of organisation restructuring with a shift away from a functional and development focus, to a primary focus on integrated management of a range of services (refer to Figure 5.2).
FIGURE 5.3 SIZE OF ORGANISATIONS: METROPOLITAN WATER AUTHORITIES

FIGURE 5.4 SIZE OF ORGANISATION: RURAL WATER AUTHORITIES
In the late 1970s, a number of the organisations incorporated corporate planning units to assist in forward planning and in the development of corporate management strategies. This appears to have been more a response to government policies than a genuine shift in administrative perspectives within the organisations at the time, with the exception of the EWSD.

Again, with the exception of the EWSD, there was little change in the structure of the organisations up until the early 1980s.

5.3.4 Professional mode

(a) Theoretical framework

As noted previously, professions use an ideology of status to legitimate their autonomy and authority. (13) Professional ideologies place great stress upon the essential worth of their practice: justice, equity, health, community well being, technical progress as a central value of social existence, rationality, and position based on merit.

Professions legitimate their authority on the basis that:
- they provide a service in the wide community interest;
- they are the repository of specialist knowledge which is maintained for the public good;
- they are dedicated in the service of the community rather than self interest;
- the nature of their knowledge and tasks is unsuited to routinised controls, i.e. only the practitioner can fully understand the nature and application of the specialist knowledge;
- they promote the technological and industrial growth associated with material advancement;
- professional practice accords with the ideology of technical rationality as the pre-eminent mode of thought in society.

The 'legitimation of professional authority' requires compliance with the following:-
- the concept of service in the community interest rather than self interest, as institutionalised in the professional code of ethics;
- adherence to the concept of provision of services guided only by technical rationality;
- the provision of an expert body of knowledge and practice.

Professional rationality or purposive rational action comprises the application of rules derived from 'a priori' knowledge to achieve a pre-determined set of end-goals (14). Hence, strategies are pre-formulated, with subsequent
focus on the technical skill and expertise required to implement the adopted strategy. The level of commitment to the underlying strategy is such that the overall effectiveness of the strategy in meeting community needs, or the implications of the constraints and controls associated with the implementation of the strategy, are beyond question.

The professional mode is wedded to a pre-determined strategy of actions, with the knowledge constitutive interest of the incumbants vested in:

- the technically useful knowledge and rationality relevant to the prevailing strategies;
- the maintenance of the legal, administrative and technical conditions which enable the effective implementation of the prevailing strategy, i.e. a number of restrictive practices which are justified on the basis of a particular service.

The primary focus is on the effective implementation of the strategies by ensuring the application of the appropriate knowledge and skills.

Wildavsky suggests that a more realistic way of viewing the role of the professions in the policy making process is to see them as groups promoting specific theoretical or practical techniques as solutions to well defined problems, i.e. a situation of solutions in search of a problem. (15)

The ideology of the professional association is one of equal status for all members and a sense of identity with and loyalty to the profession. A network of communication and a high level of interaction is sustained as the basis of consolidating this perspective. A highly developed community language performs the dual function of maintaining internal homogeneity and increasing autonomy.

However, the major consumers of professional engineers in Australia have been a few large public corporations. In these cases, the 'in-house' professional is expected to defer to his employer (patron), and not to the professional group. As a result, the organisation imposes a hierarchical system of authority with focus on superior rather than equal status, as a basis for its justification. Consequently, professional prestige is displaced by the adoption of performance measures, rewards and sanctions determined by the employer. (16)

Whereas the principal mechanism of socialisation in the case of bureaucracy was internalisation of the organisation's roles, norms and values; the focus of professional socialisation is on the learning of technical skills and rules. In this case, the 'a priori' basis of action and associated systems of control are either technically competent or incompetent. (17)
The assessment of performance is based on demonstration of the technical knowledge and skills pertinent to the prevailing strategies.

The professional form of occupational control requires the maintenance of a small occupational group with homogeneity of outlook and interests. Professional associations require:-

.a limited level of specialisation within the occupation, or the sub-ordination of new areas of specialisation to the control of the dominant general practitioner group;
.control over recruitment, training, and discipline of members;
.advancement in accordance with compliance with the general norms and perspectives of the professional group;
.the use of professional status rewards.

Socialisation in the professional case is the process whereby the individual acquires the attitudes, values, interests, skills and knowledge (culture) of the professional group of which he or she seeks to become a member. Socialisation ensures that the group attitudes, norms and roles are internalised so that self control is normally sufficient to maintain standards of performance and ethical behaviour.

(b) Analysis of organisations

The professional groups comprised primarily the engineers involved in the investigation, design and construction tasks.

Encel notes that in the colonial bureaucracies, the superior status of the professional man was recognised from an early date. Professional men have been able to assert their right to dominance in the administrative field, even when they have long ceased to be making decisions of a professional character. (18)

Barraclough claims that engineering is a way of looking at things, and that the engineer is a man who recognises problems of the material world, and who possesses an executive capacity and specific solutions necessary to solve them. His knowledge, his ruthless powers of control, and his unflagging march towards a goal are the qualities required in successfully dealing with the relentless forces of the physical world. (19)

The expectation of technical competence of organisations, and the scarcity of technical officials in the establishment period, placed the Engineer-in-Chief in a position of considerable power.
Governments initially sought the appointment of eminent British and American engineers to develop and implement proposals. Gradually, the influence of overseas engineers waned with the rise of colonial subordinates and the adaptation of techniques to local conditions.

The imposition of a hierarchical system of control of professional groups was tolerated on the basis that superiors were properly qualified professional officers, competent to make judgements on technical matters. This expectation further reinforced the separation of the technical and administrative areas. In some cases however, the appointment of a non-qualified officer to the position of supervision was practiced, as in the case of the NSW Department of Public Works.

There was a significant growth in the numbers of professional officers employed by the authorities in the expansion period. The status of professional engineers was enhanced by such projects as the Snowy Mountains Scheme. Encel notes that 'the history of administration in the states is punctuated by the careers of such outstanding individuals who have become identified in the public eye with the policies which they administered and usually created. The building of railways, of great bridges, of water supply projects, electricity generation enterprises and the like is associated with names like Speight, O'Connor, Bradfield, Hudson and Monash.' (20)

A considerable shift in professional perspectives is evident over the period of analysis, from a primary focus on the technical feasibility of projects in the establishment period, to a primary focus on the implementation and management of large scale projects in the expansion period, and to a concern with efficiency and qualitative aspects in the re-politicisation period.

Reid notes that the role of the professional engineer, wedded to a specialised technique and practising it in a restricted field, accentuates rigidity and resistance to change. The development of self-contained professional groups reinforces fragmentation, which in turn creates narrow and rigid attitudes towards the responsibilities of the organisation. (21)

Davies notes that in the 'knowledgeable society', the professions have responsibility for the application of new knowledge in policy formulation. Organised in their own associations, professional ambition and reputation become harnessed to meeting higher standards. To a large extent, the professions are coming to pre-formulate public policy in our society by their own discussions, research and demands. They press upon government the rough shape of solutions to problems in their field, as well as the kinds of men to advance to positions of influence. (22)
Davis observes that as human knowledge has increased, our ability to solve basic social and economic problems has diminished as a result of over specialisation and an adherence to narrow professional values. Agencies try to achieve a 'halo' effect of objectivity and professionalism, while on the other hand engaging in brokerage politics to get their views and aims legitimated and dominant among policy inputs. (23)

5.3.5 **Technological mode**

(a) Theoretical framework

The application of knowledge through technology is seen by post-industrial societies as fundamental to the advancement of civilisation and to the material well being of members of society. (24)

The sources of legitimation available to the technical groups comprise:

- the material benefits which derive from the application of specialist technical knowledge;
- their perceived ideology of technical rationality;
- the specialist nature and contingencies associated with their task;
- the status associated with specialist technical knowledge appropriate to prevailing techniques within the organisation.

Technology introduces a number of specific techniques which modify the relations of authority, systems imperatives, socio-technical arrangements, and organisational rationality. Contingency is the principal determinant of the level of application of 'specialist knowledge and skills' as a problem-solving technique, as opposed to the application of 'routinised rules or procedures'. The introduction of new technologies impacts on the prevailing relations of authority in a number of ways, as follows:

- the technology adopted largely determines the nature of contingencies and specialist knowledge requirements, and thereby the level of delegation of authority required;
- the adoption of technology reinforces the value of 'rationality' as a source of legitimation in authority relations, and discounts the 'normative' sources of authority;
- the new knowledge, skills, techniques, and machines associated with the new technology discount the specialist knowledge and skills of existing workers, and consequently their basis of authority;
- growth in the pluralistic nature of knowledge and expertise may strengthen the steering role of the corporate level of the organisation;
- the techniques, instruments and machines determine the
range of viable worker/machine and work group inter-relations;

the new techniques require the introduction of new forms of control and consequently, modification to the basis of performance assessment.

The focus of technical rationality is on techniques of control over the environment. Strategies are pre-formulated, with subsequent focus on the effective completion of component procedures (imperative actions) for the successful implementation of the technique. Technological rationality comprises the systematisation and prescription of a set of actions (instrumental) in accordance with an 'a-priori' determined basis of action and outcomes. Facts are constituted through these structures of experience and action.

All groups have a knowledge constitutive interest in sustaining programmes which enable the application and expansion of their particular knowledge and skills and the rationality that they embody.

Technocratic consciousness fulfills the ideological function of legitimating the pursuit of particular interests. It conceals behind a facade of objective necessity the interests of classes and groups that actually determine the function, direction and pace of technological and social developments (25). At the centre of technocratic domination is the creeping erosion of the institutional framework of society (the realm of symbolic interaction) by systems of purposive rational action.

Woodward (26), Pugh & Hickson (27), Thompson & Bates (28), Perrow (29), Hage & Aiken (30), Zwergman (31) and Harvey (32) claim that technology is a major determinant of organisation tasks, degree of specialisation, size and composition of the work group, and the nature of interactions with other groups.

A number of corporate strategies are utilised in an endeavour to contain these groups, as follows:-

- co-optation of group leaders into the corporate administration level;
- identification of an acceptable (legitimation basis) steering mechanism, such as decision making criteria (MBO) or representation on executive decision making committees;
- diffusion of the functional groups rather than consolidation as single disciplines;
- seal off core technologies on the basis of provision of highly prescribed services, with executive decision making retained by the corporate administration;
- seek a pivotal role between competing groups.

Because of the specialist nature of technical functions
within the organisations, and their associated contingencies, control of activities and recruitment, training and promotion is largely vested in the functional groups. Consequently, organisation management at the corporate level has little justification (legitimacy) to intervene in this self regulated system. The corporate steering role is substantially limited to allocation of available funds across the competing groups.

Socialisation in the case of technology requires members of the group to develop a commitment to instrumental values, and to the development of specialist knowledge and skills relevant to the prevailing techniques. Assessment of performance is based on demonstration of the application of the specialist knowledge and skills pertinent to successful implementation of the prevailing techniques.

(b) Analysis of organisations

A range of technological levels is evident in the water resource organisations examined in this thesis. They range from craft and small batch processes in the construction and operational areas, through routinised technical procedures in the design areas, to some specialised design and operational areas, within which knowledge is generated experimentally or via research.

A significant shift occurred over the period of analysis from a craft-based orientation in the establishment period, to an empirically based orientation in the expansion period, and to a theoretical and R & D based approach in the re-politicisation period. However, analysis indicates that the level of technology adopted varies considerably across the organisations, as outlined in the following Table.

Table 5.1 Level of technology adopted within organisations

<table>
<thead>
<tr>
<th>Period of analysis</th>
<th>Level of technology</th>
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<tbody>
<tr>
<td></td>
<td>Craft, small batch</td>
</tr>
<tr>
<td>Establishment</td>
<td>Operation Construction Design</td>
</tr>
<tr>
<td>Expansion</td>
<td>Operation Construction Design</td>
</tr>
<tr>
<td>Re-politicisation</td>
<td>Construction Design Operation</td>
</tr>
</tbody>
</table>

Mathieson notes that the success of the empirical engineer
in the nineteenth century proved to be a handicap from which engineering is still recovering. Mathieson notes that initially, scientific theory lagged far behind descriptive theory, but that with growth in knowledge, refinement of instruments, and the replacement of speculation with skilful experiment, this disparity was gradually reduced.

A major shift with mechanisation of the construction groups occurred following the second World War, and the construction groups continued to develop and adopt new technologies thereafter.

Slower change occurred in the design area. The early dam developments of organisations were marked by radical local designs. These were replaced largely by American dam design practice following the Second World War, and not until the late 1960s and early 1970s did design groups shift to the new theoretical techniques of analysis. After many years of low levels of technological input to biologically based sewage treatment systems, there were rapid advances in the development of treatment process technologies in the mid-1970s, as new groups were formed to undertake the design of these systems.

The operation and maintenance areas have been predominately craft-based until forced to shift to systems-based approaches by the sheer complexity of operation in the 1980s.
5.4 Internal sources of legitimation

5.4.1 Introduction

Two categories of legitimation must be successfully pursued for a group to gain acceptance of its claims, namely their technical validity and their normative validity.

The underlying beliefs of individuals in respect to their role and relationship to the clients that they are serving, are important factors influencing individual and collective actions. Habermas observed that "from everyday experience we know that ideas serve to furnish our actions with justifying motives in place of the real ones; what is called rationalisation at the individual level is called ideology at the collective level. In both cases, the manifest content of statements is falsified by consciousness' unreflected tie to interests, despite its illusion of autonomy and objectivity". (34)

5.4.2 Technical sources of legitimation

(a) Theoretical framework

The perceived technical authority or legitimation claims available to each group comprise:
- the function delegated to the group;
- the technical expertise of the group related to the implementation of its delegated function, and the nature of contingencies associated with the implementation of its delegated function;
- the role of the group's function in respect to the attainment of the prevailing organisation goals and priorities;
- the status of the group within the organisation (specialist knowledge, technology, performance indicators).

In the empirical-analytical sciences (or domain of work), Habermas claims that the knowledge claims of the empirical sciences are based on prescribed procedures of technical control which are possible everywhere and at all times. Facts are constituted through particular structures of experience and action. Knowledge generated by the empirical-analytical sciences is to be understood as the reflected form of the learning process, already posited within the framework of instrumental action, viz: science entails an 'a priori' basis of knowledge. (35)

Kuhn noted that 'normal science' is undertaken within the context of the prevailing paradigm, which provides not only the theory and methods guiding experiment, but also the problems requiring further elaboration. Consequently, knowledge is constituted in terms of an 'a priori'
Implicit in science and technology is the assumption that knowledge and services generated are of social value, or in the 'generalisable community interest'. This perception is more a reflection of the 'world views' or values underlying the respective domains, than any attempt at evaluation of the net benefits to society.

Implicit in the scientific methodology is an assumption regarding the technical utility of information. Questions of practical reason are ruled out of the range of science and beyond rational investigation. (37)

Wildavsky argues that policies are not determined by purposive rational action. Rather, the synoptic paradigm is merely the substance of rationalisation; a post-decision attempt to legitimate or justify the decision, drawing on inter-subjectively recognised norms of behaviour. (38)

Technocratic consciousness fulfills the ideological function of legitimating the pursuit of particular interests. It conceals behind a facade of objective necessity the interests of classes and groups that actually determine the function, direction and pace of technological and social developments. (39)

(b) Analysis of organisations

As noted previously, the differentiation of tasks was based on functions identified in the statutes of the organisations, with separation between the administrative and technical areas throughout the period of analysis, with the exception of the EWSD, which integrated the two areas in its 1980 re-organisation.

The functional groups were given a high degree of autonomy within their technical areas. The numbers of groups within the authorities are summarised in Table 5.2.

(b) Analysis of organisations

As noted previously, the differentiation of tasks was based on functions identified in the statutes of the organisations, with separation between the administrative and technical areas throughout the period of analysis, with the exception of the EWSD, which integrated the two areas in its 1980 re-organisation.

The functional groups were given a high degree of autonomy within their technical areas. The numbers of groups within the authorities are summarised in Table 5.2.

Table 5.2 Numbers of sections within organisations

<table>
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<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Syd.Bd</td>
<td>7</td>
<td>12</td>
<td>12</td>
<td>15</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Melb.Bd</td>
<td>6</td>
<td>6</td>
<td>10</td>
<td>17</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Brisb.CC</td>
<td>9</td>
<td></td>
<td></td>
<td></td>
<td>9</td>
<td>9</td>
</tr>
<tr>
<td>EWSD</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>16</td>
<td>23</td>
</tr>
<tr>
<td>SRWSC</td>
<td>6</td>
<td>6</td>
<td>7</td>
<td>15</td>
<td>17</td>
<td></td>
</tr>
<tr>
<td>WRC of NSW</td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td>17</td>
</tr>
<tr>
<td>Qld.WRC</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>16</td>
<td></td>
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</tbody>
</table>

The technical groups having line functions were delegated considerable autonomy, in view of their high visibility,
and the imperatives and contingencies associated with their tasks. They were contained in professionally and technologically based modes of control. Within the technical area, the construction groups had considerable advantage over the design and operation groups, in view of their greater level of associated imperatives and contingencies, their remoteness, and the scale and visibility of their works.

Within the administrative areas, the routine and centralised nature of the administrative tasks enabled the adoption of the bureaucratic mode of control.

As noted previously, greater support was available to the technical expert than to the administrative official, with administrative tasks subordinated to support for the technical tasks in many cases. Technical personnel utilised professional publications as the basis for dissemination of ideas and practice with counterparts in other organisations, rather than dissemination and discussion within their own authorities. Consequently, professional status and rewards accrued to a considerable extent from outside the authority.

The limited extent of staff rotation, and the high level of technical rationality unique to each group, limited the access of other groups to scrutiny of technical legitimation claims. The more complex the technology, the more difficult for external groups to scrutinise the legitimation claims. This degree of insularity also generated suspicion and distrust of other groups.

Given their more centralised nature and larger size, the metropolitan water organisations made wider use of the bureaucratic mode of control than in the case of the rural water organisations.

5.4.3 Normative Sources of Legitimation

(a) Theoretical framework

In the historical-hermeneutic sciences, Habermas argues that language is the mechanism through which people can come to an understanding of themselves and their relation to others. Tradition is the medium in which meaning is created and transmitted through time, viz: tradition, pre-judgements and prejudices are not barriers to understanding, but integral elements of it. Understanding cannot escape the historicity of traditions. (40)

We grasp reality or facts with regard to inter-subjective mutual understanding of meaning. Hence, hermeneutic knowledge is always mediated through a pre-understanding which is derived from the interpreter's initial situation,
and the knowledge constitutive interest of the hermeneutic sciences is the preservation and expansion of inter-subjective understanding necessary for successful social action (40).

In a similar vein, Kuhn notes that paradigms have both an empirical content and a normative content, in-so-far as the paradigms provide not only the underlying theory which provides the basis of scientific knowledge, but also constitute the 'World Views' or basic perceptions of large areas of experience. (41)

(b) Analysis of organisations

Personal experience in and analysis of the organisations indicates that there was a high level of commitment of all officers to their organisation. The high average years of service of staff, and the employment of sons and grandsons of previous employees, are indicative of the high level of personal loyalty.

Perceptions regarding the basic underlying mission of the organisation (provision of services as the basis for alleviation of social deprivation, and for providing a minimum standard of living) provided an important normative basis for substantiating claims. Similarly, the nature and means of implementing services were enshrined in the statutes establishing the organisations. Consequently, the continued appropriateness or effectiveness of the prevailing strategies were beyond question.

The visibility of group claims in respect to the primary tasks or threats facing the organisation was a powerful source of justification. Compliance with established procedures, and participation of other groups in the development of policies were further important means of generating support. Technical groups performed poorly in these areas, preferring to substantiate their claims on the basis that failure to allocate the requested resources would lead directly to a failure to provide statutory services (power brokerage).

Factors such as accepted practice elsewhere, external professional opinion, or consistancy with past practice, were the basic means of gaining acceptance of technical claims at the normative level.

5.5 Negotiation of legitimation claims

(a) Theoretical framework

As noted above, objectivity and rationality are highly prescribed concepts in respect to the particular group's analytical framework or philosophy. Consequently,
determination of organisation priorities in cases where a range of rationality domains exist must proceed on the basis of organisation wide inter-subjectively recognised norms as the means of legitimating particular group claims.

Pfeffer argued that while society places great value on rationality and objectivity as the basis of action, organisation members use power and influence in the selective use of rational criteria in order to favour their own positions. Alternatively, the use of committees gives legitimacy to decisions on the basis of democratic participation of interest groups in the decision process. Committees also serve to diffuse the decision over a number of interest groups, and to facilitate cooptation of the dominant coalition. The intensity of inter-group conflict which constrains the use of power of any one group is a function of the scarcity of the resource being allocated. (43)

Pfeffer concludes that power is allocated initially in association with primary tasks and their imperatives, and that thereafter, groups use their position to acquire and further consolidate their power. Ideology and other techniques of legitimation are used to make their use of power less obtrusive. (44)

The negotiation of legitimation claims process comprises:

. the identification of the resource allocation requirements within each group consistent with sustaining its preferred technical strategy;
. the determination of the sources of legitimation available to each group to substantiate their resource allocation demands in a process of organisation discourse and bargaining;
. the assessment of the resources available to the organisation and the implication of each group's demands for allocation of resources for other groups;
. the identification of structural or procedural mechanisms for pressing group claims, and for challenging the claims of other groups.

The level of scrutiny of competing claims will be a function of:

. the scarcity of resources across the organisation;
. the level of divergence of claims from previously negotiated positions;
. the perception of the group as co-operative or 'empire building'.

Where conflict arises from relations of authority, the subjected group may challenge the basis of authority claims of the dominant group. The constituent interest of this type of action is one of emancipation or freedom from institutionalised forces of domination. (45)
The structures and procedures for negotiating the legitimation claims have been categorised by Thompson (46) as constituting 4 separate associations, as outlined in Figure 5.5.

**FIGURE 5.5 DECISION MAKING STRATEGIES**

<table>
<thead>
<tr>
<th>Agreement about Goals</th>
<th>High</th>
<th>Low</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agreement about causation</td>
<td>Bureaucratic; Computational; Optimisation.</td>
<td>Representative; Bargaining; Satisficing.</td>
</tr>
<tr>
<td>Low</td>
<td>Collegiate; Incremental or judgement; Feedback &amp; adjustment.</td>
<td>Charismatic; Inspired guess.</td>
</tr>
</tbody>
</table>

(b) Analysis of organisations

As noted previously, the technical strategies to be pursued were substantially prescribed in the statutes establishing the organisations. Primary focus was on the effective and efficient implementation of these strategies. Drawing on external demands, functional groups made an assessment of the programme of works necessary, consistent with established techniques, to maintain compliance with the statutory responsibilities.

The separation of administrative and technical groups provided the organisations' executives with a means of control of technical programmes, namely control over the allocation of funds between competing demands, and thereby the power to require each group to substantiate its claims in terms of the interests of the organisation.

The executive also retained the authority to approve group requests for the establishment of new staff positions, thereby controlling the resources available to each group to compete in the legitimation negotiation process.

5.6 Legitimation model

The legitimation components outlined in this Chapter, together with components from earlier Chapters, are represented in Figure 5.6 Legitimation Model: Second Cut and Figure 5.7 Negotiation of priorities sub-model. These models provide the basis for the testing of the thesis hypothesis in the following section.
FIGURE 5.6 LEGITIMATION MODEL: SECOND CUT

FORMATIVE FACTORS

EXTERNAL SOURCES OF LEGITIMATION
- Role of the State in the provision of services
- Public administration practice
- Commitment to technology

EXTERNAL SUPPORT
- Political support
- Client support
- Professional support

EXTERNAL SOURCES OF LEGITIMATION
- Role of the State in the provision of services
- Public administration practice
- Commitment to technology

PERCEIVED PRIMARY TASKS FACING THE ORGANISATION, & THE UNDERLYING IDEOLOGIES, VALUES & STRATEGIES.

DIFFERENTIATION OF TASK & DETERMINATION OF MODES OF CO-ORDINATION & CONTROL

INTERNAL SOURCES OF LEGITIMATION
- Perceived authority of group in respect to claims
  - delegated authority & contingencies of task
  - technical expertise
  - mode of control (bureaucratic, craft, professional)
  - status of group

FUNCTIONAL GROUPS & THEIR DELEGATED AREAS OF RESPONSIBILITY.

NEGOTIATION OF LEGITIMATION CLAIMS
Ability to implement preferred strategies dependent on ability to secure required physical, financial, and administrative resources.

AVAILABLE RESOURCES
- Physical resources
- Legal & administrative jurisdiction
- Capital & revenue
- Technology
- Human resources

INTERNAL SOURCES OF LEGITIMATION
- Normative righteousness or correctness of claims:
  - technical validity:
    - compliance with procedures
    - compliance with expected modes of behaviour
  - normative validity:
    - visibility of claim in respect to primary tasks or threats facing organisation
    - participation in decision making process

ALLOCATION OF RESOURCES

OUTPUTS
FIGURE 5.7 LEGITIMATION MODEL: NEGOTIATION OF PRIORITIES SUB-MODEL

Groups competing for a share of scarce resources

Negotiation of legitimation claims:
- technical validity
- normative validity

Assessment of the adequacy of funds to meet the bids of all groups, i.e. ability to maintain existing standards and strategies of service ability.

Adequate

Inadequate

Fund works & programmes

Review implementation strategies
- Resolve by
  - administrative technical
  - or financial innovation
- Identify implications

Resolve by
- Resolve by
- Identify
- shortfall
- innovation

Re-negotiate priority claims

Visibility and timing of shortfall

Low or long term

Reject claims

Political implications
- Essentiality / urgency
  - interest groups & their access to power;
  - principles of equity & fairness;
  - compliance with the law, recognition of the rights of individuals & property rights.

Social & economic implications
- Essentiality / urgency
  - essential works category: housing, utilities, safety, health;
  - aesthetic or amenity category: environmental protection, landscape, social amenities, recreation, quality & reliability of services.
5.7 Explanatory analysis

5.7.1 Introduction

Drawing on the theory development and analysis of organisations in previous Chapters, the distribution of legitimation sources across organisation groups are summarised in Tables 5.3 & 4.

The major input-output associations identified in Chapter 4 have been grouped under eight major headings in the following sections for the purpose of testing the power of the legitimation theory to explain the observed associations, anomalies, changes, and obstruction to change.

5.7.2 Dominant groups

(a) Input-output association

A substantial level of service provision in response to demand was attained by organisations, including augmentation of services to match a prodigious growth in demand during the post War years. Exceptions:

(i) Periods of poor provision of sewerage services, particularly in Brisbane and Adelaide, and in all metropolitan areas during the 1960s and early 1970s

(ii) After major initial investment in sewage outfall and treatment systems, lack of augmentation or upgrading of facilities until the sewage backlog crisis of the 1960s.

(iii) Low priority given to expenditure on flood protection and drainage works.

(iv) Provision of irrigation blocks and water supply well in advance of any demonstrated demand in Victoria, NSW and more recently, Queensland.

(v) Poor provision of rural town water supply and sewerage services, except in SA (quantity aspects only).

(vi) Shift to planning and management orientation to resource development in the late 1970s.

(b) Explanatory analysis

The organisations were established and provided with autonomy on the basis of provision of specific prescribed services upon demand, based on principles of equity and fairness. The early enterprise established a number of functional groups to undertake the provision of these services. The design, construction and operational groups supported the continued provision of services as the basis of promoting their own knowledge constitutive interests.
Reference to Tables 5.3 (a) to (c) indicates that water supply sustained the highest external and internal levels of legitimation, reflecting its high visibility, contingency, specialisation and technology, and its essential nature. As noted in Chapter 4, the incidence of drought was an important source of legitimation, enabling commitment of substantial funds to water supply storage augmentation.

Sewerage services, in comparison, had a low visibility until such time as the backlog in provision reached such proportions that gross pollution of waterways became visible. Other factors were the availability of substitutes, and the low level of technology initially applied.

Drainage and flood protection had a very low level of visibility and external and internal legitimation, until such time as a major flood event occurred.

As provision of recreation facilities was not a statutory requirement, provision of recreation facilities was tied to justifying the major storage projects, or to promotion of the service image of the authority.

In the case of irrigation water supply, the visibility of major water conservation storages provided an important symbol of government investment in the rural electorate. Rural town water supplies on the other hand, often involved upgrading of existing services at a high cost, and with limited political benefit. Conservative rural town communities frequently accepted poor level of services as the norm, and were ineffective as a lobby group.

5.7.3 Pervasiveness of development perspectives

(a) Input-output association

The principal focus of activities was on the structural means of provision of services upon demand, by construction of large storages, bulk supply mains or channels, and distribution pipe networks in the case of water supply, and the construction of collection and outfall sewers and disposal facilities in the case of sewerage. There was a failure to incorporate management techniques in respect to managing or regulating demand, or to incorporate risk considerations into design of services. Irrigation organisations divested themselves of responsibility for the establishment, settlement and administration of irrigation areas, and consolidated their water supply construction and operation functions. Organisations exhibited poor performance in undertaking extension or water utilisation advisory services.
Exceptions:
(i) The technique for protection of the quality of water supplies (closed or controlled catchments) involved a regulative type approach to provision of services;
(ii) The Sydney Board and the EWSD attempted to limit urban development in the 1960s to areas accessible to services;
(iii) The use of septic tanks by the Melbourne Board and the EWSD during the sewerage backlog of the 1960s and early 1970s;
(iv) The SRWSC and the WCIC undertook channel leakage control programmes in the late 1960s;
(v) The Sydney and Melbourne Boards adopted trade waste standards and charges in the mid 1970s;
(vi) More rigorous administration of diversion licences by the rural water organisations in the late 1970s;
(vii) Shift to management orientated policies by the EWSD in the mid 1970s.
(viii) Adoption of performance criteria and asset replacement programmes by all organisations in the 1980s;
(ix) Adoption of a system of water rights by the rural water organisations which varied the water allocation according to the state of storages at the commencement of the irrigation season;

(b) Explanatory analysis

The establishment of the organisations subsumed the question of 'what' services were required, and the strategies underlying their provision. Consequently, the major focus was on 'how' the services should be implemented. Given the universal support for promotion of material well being, the early establishment of groups having expertise and skills related to the implementation of specific techniques, and the early success of these groups in the provision of services and improvement in social conditions, there was little basis for challenge to the structural approach.

Resource management-type perspectives were outside the prevailing 'development' and 'supply upon demand' philosophies, and constituted a direct threat to the knowledge constitutive interests of the established groups. Consequently, a shift in service philosophy was not viable until such time as full utilisation of available resources was reached. This situation was first approached in SA in the mid-1970s, and by other states and metropolitan areas in the late 1970s to early 1980s.

Within the irrigation organisations, water supply design and construction groups were able to sustain successful programmes of development of infrastructure, whereas the administrative groups embroiled in land settlement and administration were confronted by conservative and
articulate settlers having their own vested interests and rights, and direct access to government. In the face of such opposition, the administrative approach of 'application of procedures and the controls enabling effective implementation of techniques' was not viable. Given the extent to which this philosophy underlay the establishment of the irrigation authorities, authorities lacked the philosophic resources to grapple with these areas of administration, and ultimately withdrew from them. Similarly, the performance of organisations in the area of extension services has been poor throughout the period of analysis.

While early design and construction groups drew on empirical hydraulic engineering practice established in canal, mining and early sanitary practice, the link between fecal pollution of water supplies and disease had just been established, and the science of water treatment was well outside the scope of knowledge of the pragmatic engineers of the late 19th century. Consequently, the adoption of closed or controlled catchments provided a pragmatic means of resolving the water quality management requirement.

Notwithstanding the dominant 'supply upon demand' philosophy, some adaptation was demonstrated by groups where internal allocation of funds limited their continued application of prevailing techniques. The adoption of septic tanks, temporary package plants, and attempts to control development areas by the sewerage groups are cases in point.

5.7.4 **Entrenched nature of implementation techniques**

(a) Input-output associations

Organisations pursued the prevailing implementation techniques until such time as the resources available within their jurisdiction necessary for the techniques were fully utilised. Organisations then sought the allocation of additional catchments to enable further extension of the technique, rather than modify the technique. In situations of scarce funds, the preferred technique was simply deferred rather than adopt an alternative technique.

Exceptions:

(i) EWSD adopted a range of water supply strategies (regulation and diversion, basin transfer, groundwater supply, re-use of wastewater, and water use restrictions) from 1950 onwards;

(ii) WRC of Qld developed both surface water regulation and diversion and groundwater supply systems for irrigation water supply in the 1970s.

(iii) Sewerage groups adopted alternative techniques pending availability of funds to fully implement the preferred technique.
(b) Explanatory analysis

The legitimation accruing to groups who were effective in the provision of services, and who sustained techniques for which the technical validity was clearly demonstrated, was such that the groups could pursue their knowledge constitutive interests based on these techniques with impunity. When a situation of full utilisation of resources within the organisation's jurisdiction was reached, these groups sought further allocation of water resources to the organisation to enable continued implementation of the service technique. Any proposal to modify the prevailing technique at this stage would conflict with the knowledge constitutive interests of the group, and have little legitimation support within the organisation unless further allocation of resources was not forthcoming.

The diversity of techniques applied by the EWSD in Adelaide probably reflects the situation of extreme scarcity of water resources and funds, and consequently, the ability to substantiate a range of techniques based on other criteria (economics).

In the case of the Qld WRC, both regulation of surface supplies and utilisation of groundwater resources were well established techniques prior to the establishment of the organisation.

5.7.5 Reactive basis of project commitment

(a) Input-output associations

While considerable human and technical resources were invested in forecasting growth in demand and in programming the augmentation of services, the commitment to new works was almost invariably associated with a major flood, drought or pollution event, or new environmental legislation.

(b) Explanatory analysis

The occurrence of a major drought, flood or pollution event clearly substantiated the claims of the relevant interest group to the need for augmentation or upgrading, and provided external support (policial and client) for investment in specific service areas.

5.7.6 Professionally determined standards

(a) Input-output association

There was considerable investment in improved reliability and standards of services in response to professional
ambition rather than identifiable consumer demands. Organisations performed poorly in respect to conducting consumer surveys or in the involvement of consumers in determining service preferences. Consumer complaints were used by technical groups as the basis for justifying expenditure on upgrading services.

(b) Explanatory analysis

The knowledge constitutive interest of professional groups was one of expanding their specialist knowledge and excellence in their respective areas. The upgrading of standards is legitimated on the basis of community interest. Given the autonomy of the technical areas, there is no means for other groups to challenge the need for higher standards in relation to acceptable levels of performance. The organisations have been poor at monitoring consumer satisfaction.

The environmental movement of the 1970s called into question both the need for augmentation programmes and the appropriateness of prevailing techniques. The views espoused by the environmental movement were perceived by technical groups as conflicting with the very basis of their service provision. The 'service upon demand' basis of development was inadequate to cope with a pluralistic value situation.

5.7.7 Limited corporate role

(a) Input-output associations

Organisations adopted a single function approach to the development of services, with little attention given to opportunities for multiple use, or to other organisational instruments for managing services. Organisations were slow to respond to the dramatic changes in their operating environments in the 1960s and 1970s, or to negotiate changes in their statutes to enable more appropriate responses to changing community needs.

Exceptions:
(i) Brisbane CC adopted recreational use of the North Pine Water Supply Reservoir in 1979;
(ii) The rural water organisations tolerated recreational use of their reservoirs, and incorporated hydro-electric facilities into some dams, but in each case, these activities were secondary to the water supply function;
(iii) Organisations incorporated environmental considerations into project analysis in the mid-1970s, where required to achieve project acceptance;
(iv) There was a shift to corporate planning in the late-1970s, and the adoption of water plans as the basis of systematic and comprehensive allocation, planning
and development of water resources in the 1980s;

(v) The Sydney Board and the Brisbane CC negotiated extensions to their service areas with adjacent local government authorities, and the EWSD instigated negotiations with government to amend its legislation.

(b) Explanatory analysis

The social needs and the strategies and techniques for meeting the needs were clearly identified in the statutes of the organisations at the time of their establishment. Major focus thereafter was on the technical tasks of implementation. Consequently, the corporate executive role was limited to facilitating the work of the functional groups. The substantial success of the functional groups over the establishment and expansion periods in the provision of services, and the climate of diffuse external support for these programmes, further limited the role of the corporate executive.

Until such time as a situation of scarcity or external threat to the authority existed, the corporate executive lacked the legitimation sources to challenge functional group programmes. The limited rotation of staff, and recruitment (selection of job applicants) directly by the technical groups, further reinforced the narrow functional perspective prevailing in the organisations. The direct intervention of the corporate executive in expenditure authorisations embroiled the executive in the day to day decision making. Given the enormity of these programmes, the executive was diverted from broader corporate considerations.

In the face of growing pluralistic demands in the re-politicisation period, in association with continued growth in demand for basic services, the functional groups initially compromised techniques to incorporate consideration of other issues, to the level necessary to sustain support for project authorisation. So long as resources were available to sustain the prevailing technique however, there was little fundamental change in programmes.

The shift to a corporate planning and resource management orientation in the late 1970s and early 80s was a paradigm shift. It required overt government action and public demonstration to achieve the shift in perspective. Most importantly, it required the situation of full utilisation of resources such that the 'development' based strategies were no longer viable, before a sufficient shift in sources of legitimation could occur to achieve functional group acceptance of the the claims of the corporate executive. In many cases, the corporate executive had come from the ranks of the functional groups, and were consequently not
sympathetic to the need for change. An exception was the EWSD.

5.7.8 Financial management perspectives

(a) Input-output associations

Organisations generally raised sufficient revenue to cover costs. However, the tariff and price setting policies reflected an accounting perspective rather than economic management or use of rates as a demand management instrument.

Exceptions:
(i) Provison of rural services was substantially subsidised by government;
(ii) The Sydney Board imposed developers' charges in the 1960s;
(iii) The Sydney and Melbourne Board adopted trade waste charges in the mid 1970s;
(iv) The EWSD modified its water tariff structure to promote more efficient use of water in 1978.

(b) Explanatory analysis

While administrative practice required that the organisations behave commercially (charges covering costs together with a moderate return), the establishment period values of the principle of service upon demand, the right of every Australian to a minimum standard of living, and the allocation of charges according to the ability to pay (social equity) substantially modified corporate economic perspectives.

Given the major focus on the technical aspects of implementation of services, and the deferral of rate implications of cost of services as a result of substantial levels of capital borrowing, the financial groups had little basis for intervening in line function programmes.

In the case of rural water authorities, governments intervened at an early date in deferring charges and subsidising programmes. Consequently, in the case of rural water organisations, the financial groups were even further disadvantaged in the negotiation of the legitimation process. Only where capital was extremely scarce was there an opportunity for financial groups to challenge broad expenditure programmes. Given their 'service' status within the organisation, this situation was rarely extended to application of demand management. Not until a situation of limiting water resources was reached did the functional groups accept the financial proposition of use of charges to limit demand.
5.7.9 Adoption of Technology

(a) Input-output associations

Organisations adopted heavy equipment approaches to construction in the post-War years, and rapid development and adoption of new technologies in construction since that time. A shift to a theoretical basis of design occurred in the late 1960s, and systems based approaches to operations occurred in the 1980s. There was a low level of technology utilised in wastewater treatment until the rapid growth in process water and wastewater treatment technologies of the mid 1970s. The sewerage design area has demonstrated greater adaptation than the water supply area.

Exceptions:
(i) The Brisbane Water Supply & Sewerage Board adopted water treatment as early as 1894.

(b) Explanatory analysis

The second World War represented a disjunction in construction groups such that the Returned Soldiers exposed to the use of heavy equipment during the War, were un-opposed in introducing these techniques upon their return to the authorities. The knowledge constitutive interests of the construction groups was one of development of new construction techniques. The post-War focus on 'national development' provided external support for the adoption of new construction techniques, and large construction undertakings, e.g. the Snowy Mountains Scheme.

On the other hand, the codified techniques in the design areas were less amenable to change. Not until a new generation of post-War engineers, steeped in theoretical techniques arrived in the late 1950s, did a shift to theoretical and research and development based design techniques occur. This shift in dominant knowledge constitutive interests within the design groups was enabled by the push for new construction methods (shift from masonry dams to earth and rockfill dams), the sheer scale of works required of the authorities, and the external advance in technology.

The operational groups were even less amenable to change. The knowledge constitutive interest of these groups was the internalisation of procedures for effective operation of systems. This knowledge was learnt on the job, and was largely uncodified. Not until the rapid expansion in the complexity of systems in the 1970s were these groups forced to adopt systems management based technology.

The development of process-type technologies in the water and wastewater treatment areas in the 1970s gave new support to the adoption of these techniques within the organisations.
Brisbane was faced by a situation of both unreliable water supply and pollution at the time of the establishment of the Brisbane Water & Sewerage Board. While the Brisbane River represented a reliable early source of supply, water treatment was required to ensure an adequate quality of supply. The early establishment of a water treatment design and operation groups, ensured that this technique was given substantial support in the subsequent negotiation of legitimation process.

5.8 Findings and conclusions

The analysis has demonstrated that a wide range of social, economic, political and technical factors are implicated in the policy determination process. The analysis has also indicated that notwithstanding this diversity of factors, a considerable similarity exists in outputs across the range of organisations evaluated.

The analysis of individual organisations indicated that formative enterprise was an important factor pre-determining subsequent options for action. It appeared that the strategies adopted during the formative years became institutionalised within the organisations in terms of implementation techniques and the related structures of control and functional groups. Subsequent action focussed on the technical aspects of implementation of the adopted techniques.

The analysis indicated that the knowledge constitutive interests of the groups associated with the implementation of the technical functions was an important factor determining the nature of outputs and that a major shift in the organisation's environment (redistribution in sources of legitimation) was required before a shift in the prevailing strategies could occur. Groups were motivated in the decision making process by their knowledge constitutive interests and sought to justify requests for resources by claims to normative and technical validity of their programmes. They justified their actions on the basis of their perceptions of rationality, objectivity, and freedom from self-interest.

The legitimation theory of action appeared to provide a plausible explanation of the observed phenomena in all cases.

The sources of legitimation which appeared to provide significant justification for action or inaction, were:
- effective provision of the nominated services;
- statutory and legal requirements;
- government policies, where they accorded with the knowledge constitutive interests of the dominant
groups;
. visibility of the need and of the service;
. status or technical prestige associated with the implementation process or works;
. the continued viability of implementation of the adopted strategies;
. the contingencies associated with the task and the associated level of autonomy accorded to the respective groups;
. the previous patterns of resource allocation and services;
. the underlying ideology of the organisation:
   . service upon demand; or
   . exploitation of natural resources in the provision of material (well being) benefits and economic growth; or
   . custodian of resources, with responsibility for allocation and development in the broad community interest.

It was found that in all cases, the statutes empowering the organisations to undertake works subsumed the strategies considered appropriate at the time for the resolution of social and economic issues for which the organisations were established to solve. This was the basis upon which Parliament had delegated autonomy to the statutory authorities in the latter part of the nineteenth century, viz: the tasks were highly prescribed and solely of a technical nature.

In turn, the adopted strategies largely determined the nature of the groups required and their inter-relation. The performance criteria identified again reflected the critical components of the adopted implementation technique.

In effect, the nature of the services relevant to meeting the societal needs of the late nineteenth century, were appropriated by a formative group, which subsequently promulgated a vision of the primary tasks associated with service implementation. Subsequent experience was mediated through past interpretations, and was either deemed to substantiate the validity of those interpretations, or else was discarded. Leaders emerged to control the process and to allocate authority and rewards based on demonstrated compliance to members of the group. So long as the ideology is reasonably successful, the ideology and its custodians are unlikely to be challenged.

Consequently, the scope and perspectives of occupational groups tended to be restricted to areas directly related to the implementation of the strategy adopted in the formative period. So long as the organisation was able to sustain the provision of nominated services, the appropriateness of the strategy was beyond question. The roots and origins of the adopted strategies were long since forgotten as personnel
concerned themselves only with the effective and efficient implementation of delegated tasks. The recruitment, training, and promotion were similarly tied to tasks and skills directly associated with the adopted strategies.

Consequently, where substantial shifts occurred in the external environment, organisations frequently lacked the groups having the scope of perspectives, knowledge and interests to utilise the shifts in legitimation to bring about a shift in the output of the authorities.

Executive, bureaucratic, professional and technological modes of management are first and foremost, bases of authority, and secondly, systems of communication and action. The contingencies associated with the major design and construction groups overwhelmed any attempt at corporate management, particularly in the 1960s and 70s. As a result, development became the all pervasive ethos of the organisations. The administrative groups were at a serious disadvantage in relation to the authority of the technical groups from an early date, and were forced to buffer themselves from the technical groups by the identification of a separate division within the organisation, responsible to the statutory head of the organisation.

There was also a shift in many of the organisations from an initial administrative perspective, to a development (design and construction) ethos, to a planning and management orientation in the 1980s. As noted above, the contingencies and source of legitimation available to the technical areas overwhelmed the administrative areas from an early date. So long as the adopted strategies could be pursued in isolation, and on the basis of 'supply upon demand', there was little need for a corporate or administrative steering role. Only when the implementation of strategies had reached full exploitation of available resources, or growth in pluralistic demands destroyed the concept of an identifiable 'general interest', was it possible for a corporate planning perspective to emerge.

There has been a complete absence of policy performance evaluation. The professional groups perceived of themselves as experts in their respective areas, and best able to advise their organisation on service needs and implementation related to their area of responsibility. This position is a reflection of the extent to which the focus of these groups is limited to the effective and efficient implementation of the adopted strategy. The appropriateness of the strategy to the social and economic needs of the time is implicit in the very nature of their commitment to high technical and professional standards in the service of the community.

The analysis has suggested that the adaptation process is analogous to ecological systems. Under conditions of few
constraints to an authority's activities, the dominant
group (organism) can pursue its preferred strategy. As
conditions become more competitive as a result of a
depressed financial climate, challenges to the
organisation, or scarcity in the availability of physical
resources, greater stress is placed on the legitimation
process, and the outputs are more likely to reflect the
external environment (new organisms and strategies emerge
to exploit the ecological niche).

Unlike the ecological system, the legitimation model
suggests that as a result of each negotiation-of-
legitimation round, the agreed position becomes the basis
(feedback loop) of internal legitimation for the subsequent
negotiation round. While claims for an additional
allocation of resources may require substantial levels of
legitimation for a group to successfully sustain a claim,
any proposal to withdraw previous levels of resource
allocation could engender a legitimation crisis for the
corporate executive. Consequently, sources of legitimation
or relations of authority tend to become frozen over time.

Four major periods of adaptation in outputs were observed
over the period of analysis. Firstly, the early development
and administration of irrigation areas, during which the
social and economic deprivation of the settlers required
substantial modification to farm development and
administration practice. Secondly, the dramatic shift to
the utilisation of heavy mechanical equipment following the
second World War. This was a practical extension of the
knowledge constitutive interests of the construction
groups, and was facilitated institutionally by the
disjuncture in personnel continuity caused by the
depression years and the War. Thirdly, the major sewerage
programmes implemented in the late 1960s as a result of the
visibility of pollution in the late 1960s, enactment of
environmental legislation in the early 1970s, and
availability of Commonwealth funds to undertake development
programmes. Fourthly, a shift to a planning and management
perspective in the 1980s in the case of some of the
authorities as a result of full exploitation of water
resources, the enactment of environmental legislation, and
the focus on administrative reform.

The thesis has adopted a range of organisation types for
comparison purposes. It was found that a high level of
similarity existed between the three types of organisations
with respect to service strategies, organisation structure,
perspectives, and administrative mechanisms.

All organisations, with the exception of local government,
made extensive use of statutes as their administrative
basis of operation. Even within the government department,
government policies were either subsumed within existing
statutes, or provision was made for new statutes.
The break in the rating and funding nexus in the case of the department and departmental corporations effectively removed the requirement for financial viability.

The local government authority (Brisbane City Council) was severely constrained under its Act with respect to its administration of water supply and sewerage services. Consequently, it is considered inappropriate to draw conclusions from this example.

Groups within the public corporations tended to use their independance from government as a justification for pursuing their existing strategies, irrespective of government policies. The corporations generally lacked the corporate acumen to appreciate the risk to the longer term survival of the organisation that such a policy represented.
<table>
<thead>
<tr>
<th>Legitimation Components &amp; Criteria</th>
<th>Organisation Groups</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Water Supply Design</td>
</tr>
<tr>
<td>Formative Factors Perceived primary tasks and implementation techniques</td>
<td>Provision of a safe &amp; reliable w.s. by construction of large storages &amp; distribution system.</td>
</tr>
<tr>
<td>Groups Techniques Knowledge Constitutive Interests</td>
<td>Regulation of streamflow &amp; diversion to meet water demands. Maintenance of conditions &amp; specialist knowledge relevant to effective implementation of prevailing technique.</td>
</tr>
<tr>
<td>External Support Visibility of services Relevance to interest groups Expectations of role of govt in provision of services</td>
<td>High</td>
</tr>
<tr>
<td>External Sources of Legitimation Expectation of effective provision of services Level of specialisation Level of technology</td>
<td>Yes</td>
</tr>
<tr>
<td>External Resource Factors Scarcey of funds Droughts Floods Visible pollution Level of utilisation</td>
<td>Scrutiny of claims High visibility</td>
</tr>
<tr>
<td>Internal Legitimation Normative validity Essentiality Visibility of claim with respect to major functions</td>
<td>High</td>
</tr>
<tr>
<td>Social implications of default in provision Political implications of default in provision Consistency or divergence from past practice Consistency or divergence from practice elsewhere Level of imperatives &amp; contingencies Participation Level of technology Technical validity Level of specialisation Level of technology</td>
<td>High &amp; Immediate</td>
</tr>
<tr>
<td>Consistent Consistent Consistent High Low High</td>
<td>Consistent Consistent Interm.to high Low Intermediate</td>
</tr>
</tbody>
</table>

Table 5.3 (a) Groups: Metropolitan water authorities

188
<table>
<thead>
<tr>
<th><strong>Legitimation Components &amp; Criteria</strong></th>
<th><strong>Organisation Groups</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Recreation Design</strong></td>
<td><strong>Construction</strong></td>
</tr>
<tr>
<td>Formative Factors</td>
<td>Not a statutory requirement.</td>
</tr>
<tr>
<td>Perceived primary tasks and implementation techniques</td>
<td></td>
</tr>
<tr>
<td>Groups Techniques</td>
<td>Provision of parks &amp; barbeque facilities in association with water supply structures. Landscaping &amp; horticultural techniques &amp; control of use of areas consistent with those forms.</td>
</tr>
<tr>
<td>Knowledge Constitutive Interests</td>
<td></td>
</tr>
<tr>
<td>External Support</td>
<td></td>
</tr>
<tr>
<td>Visibility of services</td>
<td>High</td>
</tr>
<tr>
<td>Relevance to interest groups</td>
<td>High</td>
</tr>
<tr>
<td>Expectations of role of govt in provision of services</td>
<td>Low</td>
</tr>
<tr>
<td>External Sources of Legitimation</td>
<td></td>
</tr>
<tr>
<td>Expectation of effective provision of services</td>
<td>No</td>
</tr>
<tr>
<td>Level of specialisation</td>
<td>Low</td>
</tr>
<tr>
<td>Level of technology</td>
<td>Low</td>
</tr>
<tr>
<td>External Resource factors</td>
<td></td>
</tr>
<tr>
<td>Scarcity of funds</td>
<td>Scrutiny of claims</td>
</tr>
<tr>
<td>Droughts</td>
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<td>Floods</td>
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<tr>
<td>Visible pollution</td>
<td></td>
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<tr>
<td>Level of utilisation</td>
<td></td>
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<tr>
<td>Internal Legitimation</td>
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<tr>
<td>Normative validity</td>
<td>Low</td>
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<td>Essentiality</td>
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<tr>
<td>Visibility of claim with respect to major functions</td>
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<tr>
<td>Social implications of default in provision</td>
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<tr>
<td>Political implications of default in provision</td>
<td>Low</td>
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<tr>
<td>Consistency or divergence from past practice</td>
<td>Consistent</td>
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<tr>
<td>Consistency or divergence from practice elsewhere</td>
<td>Consistent</td>
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<tr>
<td>Level of imperatives &amp; contingencies</td>
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</tr>
<tr>
<td>Participation</td>
<td>Low</td>
</tr>
<tr>
<td>Level of technology</td>
<td>Intermediate</td>
</tr>
<tr>
<td>Technical validity</td>
<td>Low</td>
</tr>
<tr>
<td>Level of specialisation</td>
<td>Low</td>
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<tr>
<td>Level of technology</td>
<td>Low</td>
</tr>
<tr>
<td>Legitimation Components &amp; Criteria</td>
<td>Organisation Groups</td>
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</tr>
<tr>
<td><strong>Formative Factors</strong></td>
<td>Corporate Mgmt</td>
</tr>
<tr>
<td>Perceived primary tasks and</td>
<td>Provision of statutory services, guided by principles of service upon demand, equity, fairness, &amp; commercial behaviour.</td>
</tr>
<tr>
<td>implementation techniques</td>
<td></td>
</tr>
<tr>
<td><strong>Groups</strong></td>
<td>Finance, Accounts</td>
</tr>
<tr>
<td><strong>Techniques</strong></td>
<td></td>
</tr>
<tr>
<td>Knowledge Constitutive Interests</td>
<td>Breakfast, lunch, and dinner.</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>Control of funding authorisations as basis program management.</td>
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<td>Visibility of services</td>
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<td>Expectations of role of govt in provision of services</td>
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<tr>
<td>Low</td>
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</tr>
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<td>Corp. accountability</td>
</tr>
<tr>
<td>Floods</td>
<td>Corp. accountability</td>
</tr>
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</tr>
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<tr>
<td>Visibility of claim with respect to major functions</td>
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<td>Social implications of default in provision</td>
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<td>Political implications of default in provision</td>
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<td>Consistency or divergence from past practice</td>
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<td>Legitimation Components &amp; Criteria</td>
<td>Organisation Groups</td>
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<td></td>
<td>W.S Invest. &amp; Design</td>
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<td><strong>Formative Factors</strong></td>
<td>Improve economic viability of land by provision of large storages &amp; distribution system.</td>
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<td>Perceived primary tasks and implementation techniques</td>
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<td>Knowledge Constitutive Interests</td>
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<td>High (std.of living)</td>
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<td>Expectations of role of govt in provision of services</td>
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<td>Expectation of effective provision of services</td>
<td>Varies with community</td>
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<td>Level of specialisation</td>
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</tr>
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<td>Scarcity of funds</td>
<td>High visibility</td>
</tr>
<tr>
<td>Droughts</td>
<td>Ability to pursue preferred harvesting strategy</td>
</tr>
<tr>
<td>Floods</td>
<td></td>
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<td>Visible pollution</td>
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<td>Visibility of claim with respect to major functions</td>
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</tr>
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<td>Organisation Groups</td>
<td>Construction</td>
</tr>
<tr>
<td>---------------------</td>
<td>--------------</td>
</tr>
<tr>
<td></td>
<td>Implementing of water supply to the best standards of quality &amp; efficiency.</td>
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<tr>
<td></td>
<td>Implementation of appropriate provision of services. Authority responsible for ensuring that application of appropriate management &amp; operational techniques maintain effective provision of services.</td>
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<td></td>
<td>Techniques of water supply.</td>
</tr>
<tr>
<td></td>
<td>Provision of access &amp; reliability of water supply on major &amp; minor scales.</td>
</tr>
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<td></td>
<td>Control activities consistent with approved procedures.</td>
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Table 5.4 (b) Summary of legitimation sources across groups: Rural water authorities
<table>
<thead>
<tr>
<th>Legitimation Components &amp; Criteria</th>
<th>Corporate Mgmt</th>
<th>Finance, Accounts</th>
<th>Administration</th>
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<tr>
<td><strong>Formative Factors</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Perceived primary tasks and</td>
<td>Provision of statutory services, guided by principles of</td>
<td>Maintenance of a system of accounts, funding of works &amp; services, &amp; charges based on recovery of costs, equity &amp; fair.</td>
<td>Co-ordination of activities, monitor performance, disseminate information, undertake staffing, training, stores mgmt, legal, PR</td>
</tr>
<tr>
<td>implementation techniques</td>
<td>service upon demand, equity, fairness, &amp; commercial behaviour.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Groups</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Techniques</td>
<td>Control of funding authorisations as basis for resource control.</td>
<td>Maintenance of system of accounts &amp; cash flow management.</td>
<td>Establish rules &amp; procedures for co-ordination of activities in effective &amp; efficient provision of services.</td>
</tr>
<tr>
<td>Knowledge Constitutive</td>
<td>Negotiate external environment to maintain conditions conducive to effective implementation prevailing strategies.</td>
<td>Maintenance of programmes &amp; tariffs consistent with the maintenance of these systems. Maintenance of related knowledge.</td>
<td>Maintenance of conditions &amp; knowledge relevant to effective compliance with procedures.</td>
</tr>
<tr>
<td>Interests</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td><strong>External Support</strong></td>
<td>Low</td>
<td>Low (unless default)</td>
<td>Low</td>
</tr>
<tr>
<td>Visibility of services</td>
<td>Low (unless default)</td>
<td></td>
<td></td>
</tr>
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<td>Relevance to interest groups</td>
<td>Effective provision</td>
<td>Expect subsidised</td>
<td>Co-ordinated &amp; efficient.</td>
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<td>Expectations of role of govt in provision of services</td>
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<td>Not line function</td>
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<td>Low</td>
<td>Low</td>
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<td>Level of specialisation</td>
<td>Low</td>
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<td>Level of technology</td>
<td>Low</td>
<td>Low</td>
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<td><strong>External Resource factors</strong></td>
<td>Pivotal role</td>
<td>High visibility</td>
<td>Importance of effective administration of licences.</td>
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<tr>
<td>Scarcity of funds</td>
<td>Corp,accountability</td>
<td></td>
<td></td>
</tr>
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<td>Corp,accountability</td>
<td></td>
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</tr>
<tr>
<td>Floods</td>
<td>Negotiate additional resources or shift to new strct/tech.</td>
<td></td>
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<tr>
<td>Visible pollution</td>
<td></td>
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<tr>
<td>Level of utilisation</td>
<td></td>
<td></td>
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<td><strong>Internal Legitimation</strong></td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
</tr>
<tr>
<td>Normative validity</td>
<td>Low</td>
<td>High if scar.funds</td>
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</tr>
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<td>Essentiality</td>
<td>Low</td>
<td>Interm. (inept mgmt)</td>
<td>Low</td>
</tr>
<tr>
<td>Visibility of claim with respect to major functions</td>
<td>Low</td>
<td>Interm. (inept mgmt)</td>
<td>Low</td>
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<td>Social implications of default in provision</td>
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<td>Consistant</td>
</tr>
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</table>

Table 5.4(c) Summary of legitimation sources across groups: Rural Water authorities
5.9 References

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6. IMPLICATIONS FOR THE FUTURE MANAGEMENT OF ORGANISATIONS

6.1 Need for change

During the re-politicisation period, the water industry has been in a state of turbulence. This is a reflection of a number of changes in the socio-political and physical operating environment of the industry. As noted in Chapter 3, these changes include:

- the concern of governments to improve their co-ordination of public works programmes, such that programmes better respond to a range of regional planning, economic and social goals;
- the emergence of pluralistic aspirations within the community, reflecting a substantial attainment of basic needs within the more affluent sectors of the community, a growing concern regarding the deterioration in environmental quality, and an increasingly vocal community with an expectation of influencing its own affairs;
- the attainment of a level of utilisation (quantity and quality) of streams approaching exploitable supply or assimilative limits;
- a downturn in the economy, resulting in extremely tight capital funding and pressure on taxes and rates;
- a growing commitment to technology in the post-industrial era, as fundamental to improved standards of living.

These changes constitute a challenge to the industry to adapt perspectives, strategies, structures and procedures to more adequately reflect their operating environment. The perspectives, strategies, structures and procedures relevant to the 1980s will comprise:

- close collaboration with governments in responding to a range of social, economic and environmental objectives;
- close consultation with and participation of the public in determining preferences and priorities;
- a shift away from functional perspectives to resource management perspectives;
- the adaptation of economic and financial management strategies to embrace a wide range of external and internal factors;
- an increased utilisation of technology;
- the adoption of corporate performance and external environment monitoring;
- the extension of internal disciplines and skills to enable comprehensive policy evaluation.
6.2 Implications of the legitimation model for management

The hypothesis states that 'the allocation of resources across competing groups within organisations will be determined by the relative ability of each group to legitimate or justify its claims for scarce organisational resources. Under these conditions, significant change in the organisation's external environment (and thereby, change in the internal distribution of legitimation resources) may be required before a change in organisation outputs (services or policies) can occur.'

While the analysis found that the hypothesis provided a plausible explanation of changes or lack of changes in organisation outputs over time, it was found necessary to also incorporate the concept of institutionalised perspectives or frozen relations of authority. It was found that the prevailing perspectives and technical and administrative strategies largely reflected those of the formative groups. Over the years, the leaders of the functional groups, as custodians of the specialist knowledge required for the successful implementation of the prevailing (formative) strategies, had delegated authority and rewards on the basis of demonstrated compliance with the orthodox view. The mechanisms which contributed to these frozen relations of authority were:

- the failure to periodically test and review the assumptions regarding the primary tasks facing the organisation;
- the statutory status given to the service strategies and their associated organisation structure and performance criteria;
- the control of the functional groups over recruitment, training and promotion.

Performance criteria focused on the technical and administrative imperatives associated with the effective and efficient implementation of the adopted strategy, and excluded consideration of the ongoing effectiveness or appropriateness of the adopted strategy in respect to changes in community needs and opportunities over time. The technical imperatives comprised the application of the technical actions (knowledge) and controls necessary for the effective implementation of the adopted techniques or strategies, while the administrative imperatives comprised the application of the administrative actions (rules and procedures) and controls necessary for the effective implementation of the adopted strategies.

In the administrative areas, promotion was on the basis of demonstrated compliance with the prescribed rules and procedures or 'organisation view'. In this manner, perspectives were constrained over time to those evolving in the organisation's formative years. Within the technical areas on the other hand, a high value was placed on
technical knowledge pursued within the professional body. This provided the technical groups with some independence (external legitimation sources) from the internal institutionalised perspectives, at least in respect to the consideration of alternative implementation strategies.

Associated with each group, there were particular knowledge constitutive or vested interests. Groups failed to appreciate that their claims to objectivity, rationality, and knowledge were posited within particular paradigms or world views.

The objectivity and rationality of the technical groups was tied to the adopted strategy and its underlying techniques. The knowledge constitutive interest was one of extending the specialised knowledge and skills related to control over their view of 'reality'. The objectivity and rationality of the administrative groups were tied to the means-ends chains and their underlying concepts of authority and meaning. The knowledge constitutive interest was one of maintenance of an understanding of the purpose of the authority, via the universal application of the prescribed rules and procedures.

What are the implications of these findings for the management of organisations?

The analysis suggests that the knowledge constitutive interests of groups within the organisation are the major factor driving the organisation (source of motivation) in its provision of services, and that the corporate management simply seeks to arbitrate between these competing demands, rather than direct them. Accordingly, the focus of management needs to be one of more effective guidance of these sources of action to reflect changes in the external environment, i.e. it is more appropriate to think of an organisation as a collection of 'solutions in search of a problem' than as a rational problem solving activity. (1) Groups merely draw on inter-subjective norms to justify their claims to resources.

However, the knowledge constitutive interest of the groups and institutionalised perspectives may also constitute a major obstacle to change. Consequently, there are two implications for the management of organisations.

Firstly, there is a need to reduce the level of institutionalised perspectives prevailing within the organisations, and the resistance of groups to change. Means of reducing the constraints on adaptation include:

- the use of corporate performance monitoring and information independent of the functional groups;
- the adoption of corporate control over recruitment, training and promotion;
- the use of staff rotation to broaden perspectives
and reduce individual group allegiance; and
the periodic review of strategies and organisation
structure in terms of the strategic issues facing
the organisation.

These suggestions pre-suppose that a corporate management
level exists within the organisation, and that it has the
necessary sources of legitimation to sustain acceptance of
its claims by the functional groups within the
organisation. The analysis identified the prescriptive
nature of statutes creating the organisations, and the
corporation sole basis of authority, as being detrimental
to the emergence or legitimation of a corporate management
level within the organisations. The lack of government
performance reviews or audits, and a 'utilitarian' ideology
which justifies (source of authority) the provision of a
service merely by demonstrating a demand, are further
factors mitigating against the emergence of an effective
corporate management level.

There is a need to replace the 'utilitarian' ideology based
on the provision of a service upon demand, with an
administrative rationale which is capable of securing
acceptance (basis of legitimation), and which is more
relevant to an organisation operating in a pluralistic
environment. Corporate planning, which addresses the
strategic issues confronting the organisation, and which is
based on participation of functional groups, is one means
of redressing the functional legitimation bias.
There is also a need to broaden the ideological
perspectives and resources of the organisation in order to
be able to respond to changes in the external environment.

Secondly, there is a need for corporate management to more
effectively manage the distribution of sources of
legitimation across the organisation as the means of
directing activities, rather than attempting direct
intervention in functions, or stifling motivation and
innovation through hierarchical controls.

The distribution of sources of legitimation across the
organisation may be modified by a number of means, as
follows:
the identification and monitoring of corporate
performance criteria as distinct to technical
implementation criteria, as an input to the
corporate planning process;
the reviews of political, economic and client
climates to be undertaken as a corporate planning
function, rather than being left to the functional
groups;
the modification of statutes to remove
identification of specific services where such
services may no longer represent the most
appropriate management strategy;
the adoption of an organisational structure based on major conflict (multi-disciplinary) areas, and isolation of technical implementation groups from the policy area;
the avoidance of a structure which reinforces the single discipline focus of specialist groups;
the delegation of responsibility for economic and technical decisions in return for acceptance of a corporate responsibility for the identification of goals and implementation of (corporate) performance monitoring;
the recoupling of administrative and technical groups in sections based on clients or geographic area.

Finally, there is a need to promote a greater self-awareness of personnel within the organisations regarding the origins and underlying goals and strategies of the organisation, and of the knowledge constitutive interests underlying their claims to objectivity, rationality, and organisational resources.

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201

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