Dilemmas and Learning Accounts around the Traveston Dam Proposal on the Mary River (South East Queensland of Australia)

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River Dreaming

We are in the centre of earth
Can you hear the silent anguish from within?
I will tell you a story.
One day some drops whispered to my ears
and I entered in your cosmos.
The music of life was never faded.
Flooded with tears, then hope.
And you said "I am the river".
A union of heart and cognition.
One other companion to my future.
Oh I want to merge with the land
I want to flow in the water
I want to swing through the air
You gave my fire.
"I am a dreamer".

To All Life Fighters

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Acronyms

ICM	**Integrated Catchment Management**
IWRM	**Integrated Water Resources Management**
MRCCC	**Mary River Catchment Coordinating Committee**
STMRCG	**Save The Mary River Coordinating Group**
SEQ	**South East Queensland**
Qld	**Queensland**
QWI	**Queensland Water Infrastructure**

TABLE OF CONTENTS

Abstract

In light of one of the longest droughts in South East Queensland's in one hundred years, the Qld Labour Government announced on April 27, 2006 its intention to dam part of the Mary River at Traveston Crossing (South East Queensland). Local Mary Valley residents oppose the dam proposal due to the dislocation of the local community in the proposed inundated area and the adverse environmental impacts as well as the inundation of primary agricultural land. Another major concern is that the unsuitable geomechanics of the proposed site (sandy and flat area for a dam) will not provide thirsty Brisbane with the "promised" water.

Given the circumstances, the present research is posing two basic questions; what is the reality given by the people living in the Mary Valley after this dam proposal (an emic account) and what is the reality given by the researcher (an etic account).

The research exploration has led the people to express their own constructed worldviews which involved some resource, institutional, technical, ethical and finally political dilemmas around the dam proposal. The clearly expressed dilemmas, visions and actions of the people in the Valley have emerged as the result of a learning process throughout the years-that is a learning of what to do in order to co-exist with the Mary River and why is this meaningful to the community. However, Mary Valley residents felt that their engagement to co-manage the river, as well as the indigenous values and knowledge about the river have been disregarded by the Government planning to build a dam at Traveston.

Chapter 1. Introduction

Water, soil and air are natural resources that constitute the three basic requirements of life. Water has been an essential factor in the development of cultures and human history. Undoubtedly water is the source of life. Still most of the people regard it as a given, a good taken for granted.

We have been for years aware of the water shortages in the Middle-East or inland parts of large continents as Australia and Africa, which have been known for the adverse dry climatic conditions. However, it has not been until the last decade that we are being even more bombarded by terms such as the "water crisis" and "climate change". When most of people think about the water crisis they think about it as a local issue, something happening in a town or country far from the place they live. We usually do not believe that it is a situation worth worrying about, sharing confidence that it would be readily handled by investment in infrastructure, conservation, or other management strategies. We have been brought up to expect that science and technology will provide us with some kind of "magical" solution or that cases like these would be resolved through negotiations or in the courtroom.

However, given the present situation, water problems are attracting increasing attention at the international level and are the cause of concern not just of State Governments or Global Organizations, but also of ordinary people, citizens of the world, the non-specialized public[1]. The question is whether we believe that what we are being told about the predictions of extreme alterations of the climatic conditions in the planet and the subsequent large-scale droughts and floods are inherently correct or are we personally aware of the legitimacy of these phenomena just because we are slowly experiencing them as individuals? It could be argued that even reducing the apprehension of these changes in the context of our backyard, we know very well that there is something really wrong with the whole system of "ecos" (=home) in which we live, and this is the earth.

[1] The State of the World Population 2001, Footprints and Milestones: Population and Environmental Change, United Nations Population Fund: www.unfpa.org/swp/2001/english/ch02.html

The facts suggest that a major cause of the global water concern is the ever-increasing world population. As populations grow, industrial, agricultural and individual water demands escalate. According to the World Bank, world-wide demand for water is doubling every 21 years, more in some regions. Water supply cannot keep pace with demand, as populations soar and urban development explodes [2].

Population growth alone does not account for increased water demand. Since 1900, there has been a six-fold increase in water use for only a two-fold increase in population size. This reflects greater water usage associated with rising standards of living (e.g., diets containing less grain and more meat) [2]. It also reflects potentially unsustainable levels of irrigated agriculture.

The management solutions are suggesting that water crisis be confronted on a technological basis e.g. by building dams or desalination projects or a market approach by assigning value to water and making business out of it. On a different note other alternative approaches would involve slowing population growth, reducing pollution, better management of present supply and demand and water conservation. Still, given the circumstances, it is certain that there is a different agenda coming to surface; the need to explore the management of perceptions, due to the failure of much of the above alternatives to be coupled with some reflection on the existing social structures and the evolving learning processes among humans.

[2] World Water Assessment Programme. *The United Nations World Water Development Report 3: Water in a Changing World.* Paris: UNESCO, and London: Earthscan 2009. p.14. Chapter 1.

Chapter 2. Theory, Concepts

One Dutch water manager who had spent 15 years in development work in Bhutan, Zambia and Brazil said: 'When I took this job there was no-one who had any idea how to translate cubic meters of water into human behaviour'[3]. The latter statement encompasses the universal imperative that water issues need to be seen through the lens of the stakeholders' perceptions and lifestyles when it comes to resource functioning and decision-making.

2.1 Stakeholders and stakeholding

Stakeholders are individuals, organised groups and public as well as private agencies concerned about issues as the quality, availability, and sustainability of natural resources[4]. However, they do not all hold the same position with regard to measures proposed or taken to resolve the issues involved and they do not necessarily share the same view about what is desirable or what constitutes the 'purpose' of resource management. They have a 'stake' – a real, material interest, from their perspective – in the situation or in the resource under consideration. A person's stake can be formed in a number of ways: for example, as a resident, domestic water user, angler, farmer, professional water manager, or government official. Stakes may also overlap. Stakeholders can be concerned, for instance, that road building might result not only in wetland damage, but also in a reduction of property values [5]. Stakeholding expresses the idea that individuals actively construct, promote and defend their stake. In the case of groups, stakeholding implies a shared interest among group members, although individual members might still perceive their own stakes in

[3] Ison, R.L., Röling, N., Watson, D., "Challenges to science and society in the sustainable management and use of water: investigating the role of social learning", *Environmental Science and Policy,* vol. 10, no.6, Summer 2007, pp. 499–511.

[4] Steyaert P. and Jiggins, "Governance of complex environmental situations through social learning: a synthesis of SLIM's lessons for research, policy and practice.", *Environmental Science & Policy,* Vol.10, no.6, Summer 2007. pp. 575 – 586.

[5] SLIM (Social Learning for Integrated Management and Sustainable Use of Water at Catchment Scale) "Stakeholders and Stakeholding in Integrated Catchment Management and Sustainable Use of Water". Spring 2004. *SLIM Policy Briefing No. 2.*

[6] Jiggins, J., van Slobbe, E., Röling, N., "The organisation of social learning in response to perceptions of crisis in the water sector of the Netherlands", *Environmental Science & Policy,* Vol.10, no.6, Summer 2007. pp. 526–536.

different ways. Negotiation, dialogue and joint research undertaken in a social space (or dispositif), where stakeholders are brought together in an organised way, are seen as key elements in multi-stakeholder processes [5]. New stakes can emerge from social interactions and as these are constructed they lead to the emergence of new stakeholders. The dynamic of this process may in turn transform the legitimacy of a stakeholders' position or reveal new social asymmetries [6].

2.2 Water Resource Dilemmas

Water resources management is facing a special challenge. It has become problematic because different stakeholders increasingly make competing claims on hydrological systems. They come into conflict because the consequences of the use by one stakeholder affect the outcomes of another. This is called a resource dilemma. These kinds of resource dilemmas arise when:

- water is a common resource
- multiple stakeholders make different claims on the resource, from recreational fishing to abstraction;
- there is interdependence: stakeholders can realise their own objectives only through the actions of others;
- there is controversy: stakeholders hold strong but divergent values and perceptions about what is at stake;
- there is complexity: scientific data cannot resolve the issues because they arise from multiple causes and have multiple effects, with different expression in space and time, and the irreducible value dimensions of 'the problem' cannot easily be measured or modelled;
- there is uncertainty: in complex situations, surprise is to be expected [7].

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[7] SLIM (Social Learning for Integrated Management and Sustainable Use of Water at Catchment Scale). "The role of learning processes in integrated catchment management and the sustainable use of water". Spring 2004. *SLIM Policy Briefing No. 6.*

[8] Midgley G., *Systemic Intervention: Philosophy, Methodology and Practice (Contemporary Systems Thinking).* (Kluwer Academic/Plenum Press, New York, 2000). pp. 461.

2.3 How do we deal with resource dilemmas?

Science has been for centuries dominated by the conventional paradigm of Newtonian physics. Within this scientific worldview, the world (nature, society, economy and humans) is studied under a mechanistic principle, where all its attributes are observed in an objective way and described as distinct parts. Their behaviour is considered predictable and extreme incidents are only a result of insufficient understanding. Therefore, the more we analyse these parts, the more knowledge we gain about the world or as Midgley [8] puts it the more control we believe we have over our destiny.

Traditionally, natural resources management has usually drawn on these mechanistic principles followed by the application of appropriate scientific methods that would yield predictable outcomes and optimal solutions. As Berkes [9] explains, nature has been viewed merely as a storehouse of raw materials; resources were thought as commodities with an ultimate purpose to serve for a 'maximum sustained yield'. In this regard, science is the source of innovation [10] ensuring that the increasing 'wants' and 'needs' are satisfied. And scientists are perceived as the experts trying to transfer the promising technological innovations from the laboratory to the field, from the experiment and the simulation to the real life. But as Berkes continues, this kind of resource development may be suitable for conventional exploitive development but not for sustainable use-if the latter is defined more broadly to include a wider range of ecological, social and economic objectives.

Natural uncertainty and variability have usually been ignored and the interdependences of stakeholders are disregarded. Science is detached from the public, the role of the researcher is that of an observer and people are usually considered as passive users/adopters of technology/knowledge. In that case, this leads to the establishment of a paradigm in which the natural and the social environment are viewed as completely separate.

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[9] Berkes F. and C. Folke, *Linking Social and Ecological Systems. Management practices and social mechanisms for building resilience,* (Cambridge: Cambridge University Press, 1998). pp. 342-362.

[10] Röling N. and A. Wagemakers, *Facilitating Sustainable Agriculture. Participatory Learning and Adaptive Management in Times of Environmental Uncertainty,* (Cambridge: Cambridge University Press, 1998) pp. 283-307.

2.4 The challenge

Natural resources management is facing major challenges due to increasing uncertainties caused by climate change as well as the global socio-economic rearrangements.

In the water sector, water management has been relied upon expert technical design, knowledge transfer and one-way communication of information. This worked when water management was unproblematic. Now that is no longer the case for a number of reasons as described in SLIM [7]:

- Climate change leads to '*surprises*' in terms of extreme water events; droughts and floods can no longer be handled within the technical and territorial mandates of specialised agencies;
- Hydrological systems have become degraded and unpredictable as a result of misuse. In particular, the rapid development and intensification of agriculture under pressure from the global price squeeze has led to rapid degradation. But building and infrastructure, industrial and urban extraction of groundwater, etc., have all added to the problem. Wetlands have been drained, meandering rivers have been canalised, peat reserves have been dug down, etc. Hydrological systems have lost their resilience as a result of reduced water retention capacity, lowered groundwater tables, rapid evacuation of rainwater, and severely compromised water quality. These impacts of 'progress' and relentless economic growth on hydrological systems must be redressed by tackling the *human* behaviours that caused them.
- Water management has become problematic because multiple stakeholders increasingly make conflicting claims.

Therefore the arising question is how we would alternatively deal with the complexity of the natural resources systems which intertwine with human activities.

2.5 Change of paradigm

2.5.1 Science

Unlike the mechanistic view of science, which suggests reducing the studied object into parts and trying to narrow down any uncertainties, a new scientific paradigm has emerged in the early 20th century; systemic thinking or holism. The basic idea is that the world is

composed of complex webs, systems, and the premise lies in the interactions among their different parts and their emergent properties. As Capra [11] has noted, the more we study the major problems of our time, the more we come to realise that they cannot be understood in isolation. They are systemic problems, which means that hey are interconnected and interdependent.

In that sense, natural resources management becomes inclusive of the interrelations between natural and social systems. Sustainability is perceived as an emergent property of stakeholder interaction, and not the technical property of ecosystem or hydrological system[12]. On a similar note, Robinson et al [13] view sustainability not as a final state, but as a process, a direction in which we strive.

Instead of seeing science as the sole source of innovation and the growth point of development, recognition grew for indigenous and local knowledge. In many rural communities, people's practices are based on hundreds and sometimes thousands of years of trial and error, and the resulting technology and institutions are well adapted, robust and effective[14.]

This kind of post-normal science would require 'extended peers' who included not only academic disciplinarians but also a wider public that had to live by the results, and 'extended facts', which included not just causes but also reasons. Given the basic uncertainties of the environmental crisis, answers would need to arise from widespread participation and democratisation of science [15].

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[11] Capra F., *The Turning Point: Science, Society, and the Rising Culture,* (Simon and Schuster, New York, 1982).

[12] Bawden, R.J. and R. Packam, *Systems praxis in the education of the agricultural systems practitioner.* Richmond (NSW) 1993: University of Western Sidney-Hawkesbury. Paper presented at the 1991.Annual Meeting of the International Society for the Systems Sciences. Östersund, Sweden. *Systems Practice,* Vol. 6, pp.7-19.

[13] Robinson, J., Fransis, G., Legge, R., and S. Lerner, "Defining a sustainable society: Values, principles and definition", *Alternatives*, Vol. 17. pp. 36-46.

[14] Warren, D.M., L.J. Slikkeveer and D. Brokensha, *Indigenous knowledge systems: the cultural dimension of development*. (London: Kegan Paul International, 1991).

[15] Collins, K. and R. Ison , Dare we jump off Arnstein's ladder? Social learning as a new policy paradigm. *Proceedings PATH (Participatory approaches in Sciences and Technology) Conference 4-7th June 2006, Edinburgh*.

In summary, extension studies show an evolution from DOING TO, via DOING FOR, to DOING WITH and, some say, even DOING BY. The attention shifted from promoting specific pre-determined *results*, to promoting a *process* that is inclusive, synergetic, energising and involving. Instead of mistrusting people and making sure that they do what you want, the emphasis shifted to confidence that the right process would lead to the right outcome [16].

2.5.2 Water Resources Management

Integrated Water Resources Management (IWRM)

Integrated Water Resources Management (IWRM) is a participatory planning and implementation process that brings stakeholders together to reflect on how to meet society's long-term needs for natural resources while maintaining essential ecological services and economic benefits. IWRM helps to protect the world's environment, foster economic growth and sustainable agricultural development and improve human health while at the same time promote democratic participation in governance.

Integrated Water Resources Management (IWRM) principles have been established in Dublin [17] and are the 'integrating handle' leading us from sub-sectoral and top-down to cross-sectoral and non-hierarchical approach.

The four principles are [18]**:**

- Freshwater is a finite and vulnerable resource, essential to sustain life, development and the environment (i.e. one resource, to be holistically managed).
- Water development and management should be based on a participatory approach, involving users, planners and policy-makers at all levels (i.e. manage water with people - and close to people)

[16] SLIM (Social Learning for Integrated Management and Sustainable Use of Water at Catchment Scale). *Facilitation of social learning processes for integrated catchment management and sustainable use of water*. Summer 2004. SLIM Thematic Paper no. 2.

[17] International Conference on Water and the Environment (ICWE), The Dublin Statement and Report of the Conference, 26–31 January 1992, Dublin.

[18] Global Water Partnership, 2000, Integrated Water Resources Management, Technical Advisory Committee Background Paper No 4. Stockholm.

- Women play a central role in the provision, management and safeguarding of water (i.e. involve women all the way !)
- Water has an economic value in all its competing uses and should be recognised as an economic good (i.e. having ensured basic human needs, allocate water to its highest value and move towards full cost pricing to encourage rational use and recover costs).

Adaptive management

Pahl-Wostl [19] argues that more attention has to be devoted to understand and manage the transition from current management regimes to more adaptive regimes that take into account environmental, technological, economic, institutional and cultural characteristics of river basins. This implies a paradigm shift in water management from a prediction and control to a management as learning approach. The change towards adaptive management could be defined as "learning to manage by managing to learn". Such change aims at increasing the adaptive capacity of river basins at different scales.

Social Learning

Social learning refers to the collective process that can take place through interactions among interdependent stakeholders – given proper facilitation, institutional support and a conductive policy environment [7]. From Stayert et al [20] point of view, social learning is an iterative process of knowledge co-production (i.e. of knowing) among stakeholders brought in interaction and with knowledge understood as an individual's point of view on entities constituting the world. Desirable water catchment properties arise out of this interaction (engaging in issue-formulation and monitoring, negotiation, conflict resolution, learning, agreement, creating and maintaining public goods, and concerted action) among multiple stakeholders in the water catchment [7].

[19] Pahl-Wostl, C., J. Sendzimir, P. Jeffrey, J. Aerts, G. Berkamp, and K. Cross, "Managing change toward adaptive water management through social learning." *Ecology and Society* vol. 12. no.2. pp. 30. available online at URL: http://www.ecologyandsociety.org/vol12/iss2/art30/

[20] Steyaert P., M. Barzman, JP. Billaud, H. Brives, B. Hubert, G. Ollivier, B. Roche, "The role of knowledge and research in facilitating social learning among stakeholders in natural resources management in the French Atlantic coastal wetlands". *Environmental Science & Policy*, Vol.10, no.6, Autumn 2007, pp. 537-550.

As Steyaert & Jiggins [4] have pointed out, people have to bring up their ‘‘felt and lived’’ experiences which in turn challenge the existing forms of knowledge and values. If the unfolding dynamic of the interaction can be constituted in processes of shared learning, then practices and understanding, and sometimes also values evolve.

The exploration of the contrasting views leads to new insights and promotes learning, therefore action. Learning is motivated by tensions and conflicts and is as participative as possible, including all interested parties.

2.6 Social Learning as a Governing Mechanism

Governance serves to coordinate individual and collective behaviour. Conventionally, three governance mechanisms exist, with regard to environmental issues [21]:

- Bureaucratic forces, attempting to modify practices directly through regulations, incentives and penalties targeting human activities.
- Market forces, either assumed as the invisible hand which will resolve the problem, or adjusted through fiscal policies.
- Awareness raising through the dissemination of information. In this regard, network establishing is fundamental.

SLIM case studies [7] demonstrate the efficacy in the water sector of a fourth or complementary governance mechanism, based on interactive learning processes among area-based stakeholders, and the co-creation of knowledge brought about by joint experimentation and facilitated interaction.

The increased awareness of stakeholders and stakeholding gives rise to governance dilemmas. In interactive governance decision-making is based on social values and ethical principles and is appreciative of contextual factors and local knowledge [7].

[21] Steyaert P. and J. Jiggins. “Governance of complex environmental situations through social learning: a synthesis of SLIM's lessons for research, policy and practice”. *Environmental Science & Policy*. Vol.10, no.6. Summer 2007. pp. 575-586.

2.7 Social Learning towards Institutional Change

Institutions play a significant role in shaping the management of natural catchments and in providing the norms and values that underpin and inform policy decisions and management practices [21]. Good governance, political dialogue, fair trade and ownership all depend on the presence of adequate and locally owned institutional frameworks, both formal and informal. Concerning water governance, institutional change is possible when new kinds of networks emerge and the stakeholders participating in them gain new experiences and share those [19]. Thus, the new networks and rules of dealing with resource dilemmas would ideally direct stakeholders toward not balancing the competing interests, but toward an intersubjective agreement, as they would rely on the knowledge they have built together [5]. It is therefore essential that institutional development becomes a process of learning by doing and sharing among different stakeholders.

Chapter 3. Case Selection

3.1 South East Queensland

South East Queensland (hereafter SEQ) is Australia's fastest growing region. By 2031, its population is expected to grow from 2.8 million to 4.4 million people. The region covers 22, 890 square kilometres, stretching 240 kilometres from Noosa in the north to the Queensland-New South Wales border in the south, and 160 kilometres west to Toowoomba. SEQ's population is heavily urbanised and is generally concentrated along the coast between Noosa and Cooloongatta. According to the SEQ Regional Plan the region's growth will generate demand for 735,500 new dwellings, as well as supporting infrastructure and services. It will impose significant social, economic and environmental pressures on the region [22].

The Mary River, situated in SEQ, stretches from the Bellthorpe-Maleny region in the south and flows north entering the Great Sandy Strait at River Heads, northeast of Maryborough. The catchment is 9595 km² in area. The Mary River has several major tributaries including Obi Obi, Yabba, Little Yabba, Six Mile, Amamoor, Kandanga, Tinana, Deep, Munna and Wide Bay Creeks. Within the basin are a number of storages and weirs that provide both irrigation and urban water supplies.

Urban water use accounts for about half the water used in the Mary Basin (including the Burrum, Noosa, Maroochy and Mooloolah basins), with the remainder used for agriculture. This differs from other parts of Queensland, where irrigated agriculture is the dominant water user [23].

3.2 Traveston dam proposal

In light of one of the longest droughts in South East Queensland's in one hundred years, the Qld Labour Government announced on April 27, 2006 its intention to dam part of the Mary River at Traveston Crossing, as part of the SEQ Regional Water Supply Strategy. The

[22] http://www.dip.qld.gov.au/regional-planning/south-east-queensland.html. Cited in May 2009.
[23] Mary Basin draft Water Resource Plan. Queensland Government. Department of Infrastructure, Spring 2005.

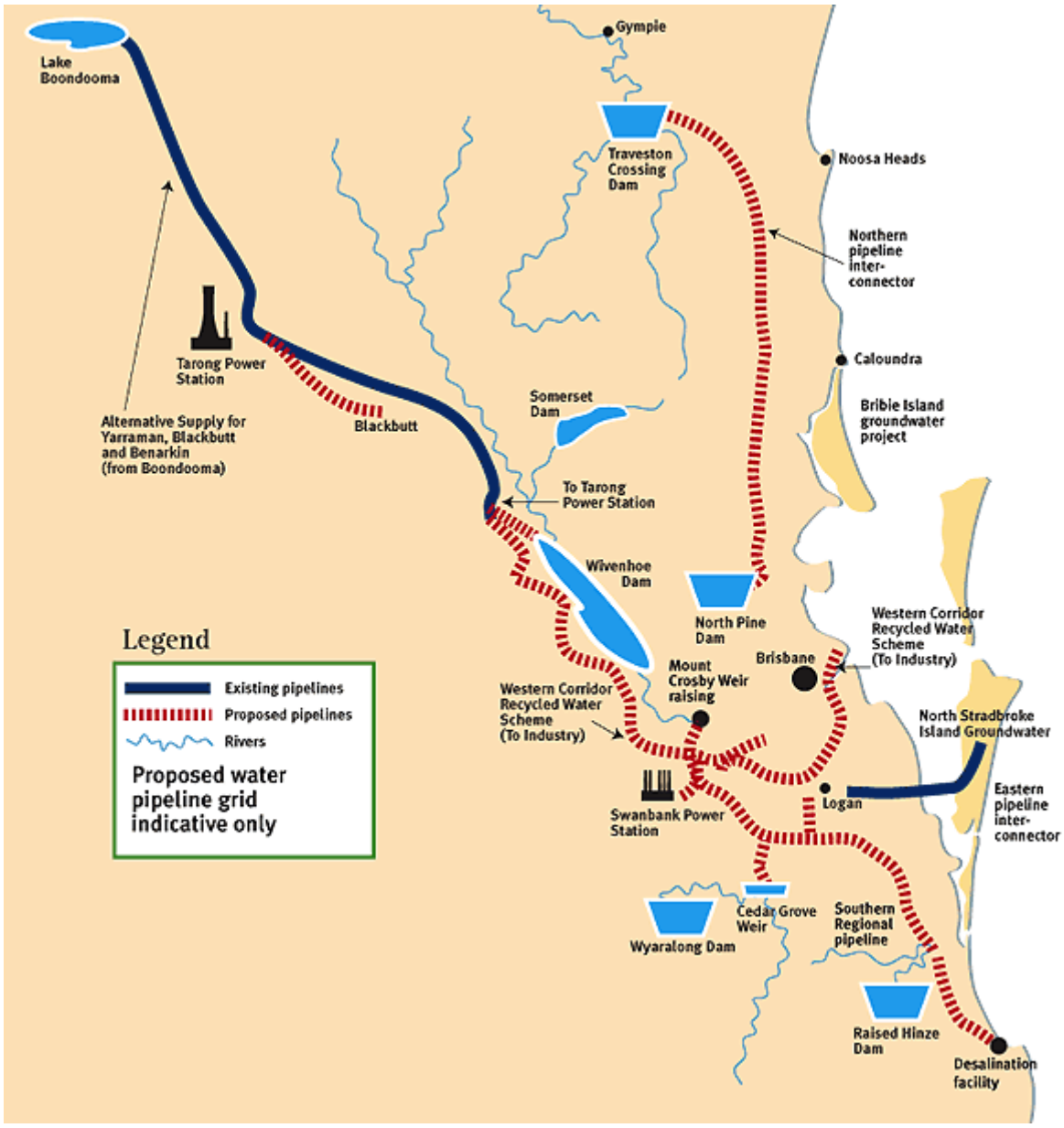
Traveston Crossing Dam proposal involves the construction and operation of a dam on the Mary River, approximately 207 km from the mouth of the river and 27km upstream of Gympie, Queensland [24].

The dam is a part of the Water Grid as outlined in the SEQ Regional Water Supply Strategy (See Map 1). This is a network of two-way pipelines that will be able to move water from areas of water surplus and transport it to areas that face water shortage. The Water Grid will allow the coordinated use of all major bulk water sources in the region, including: a) the Wivenhoe/Sommerset system, b) Hinze dam, c) The proposed Traveston Crossing and Wyaralong dams, d) the desalination plant at Tugun on the Gold Coast and e) the Western Corridor Recycled Water Project [25]. The intention is to secure and increase the available water supplies in the rapidly growing SEQ region.

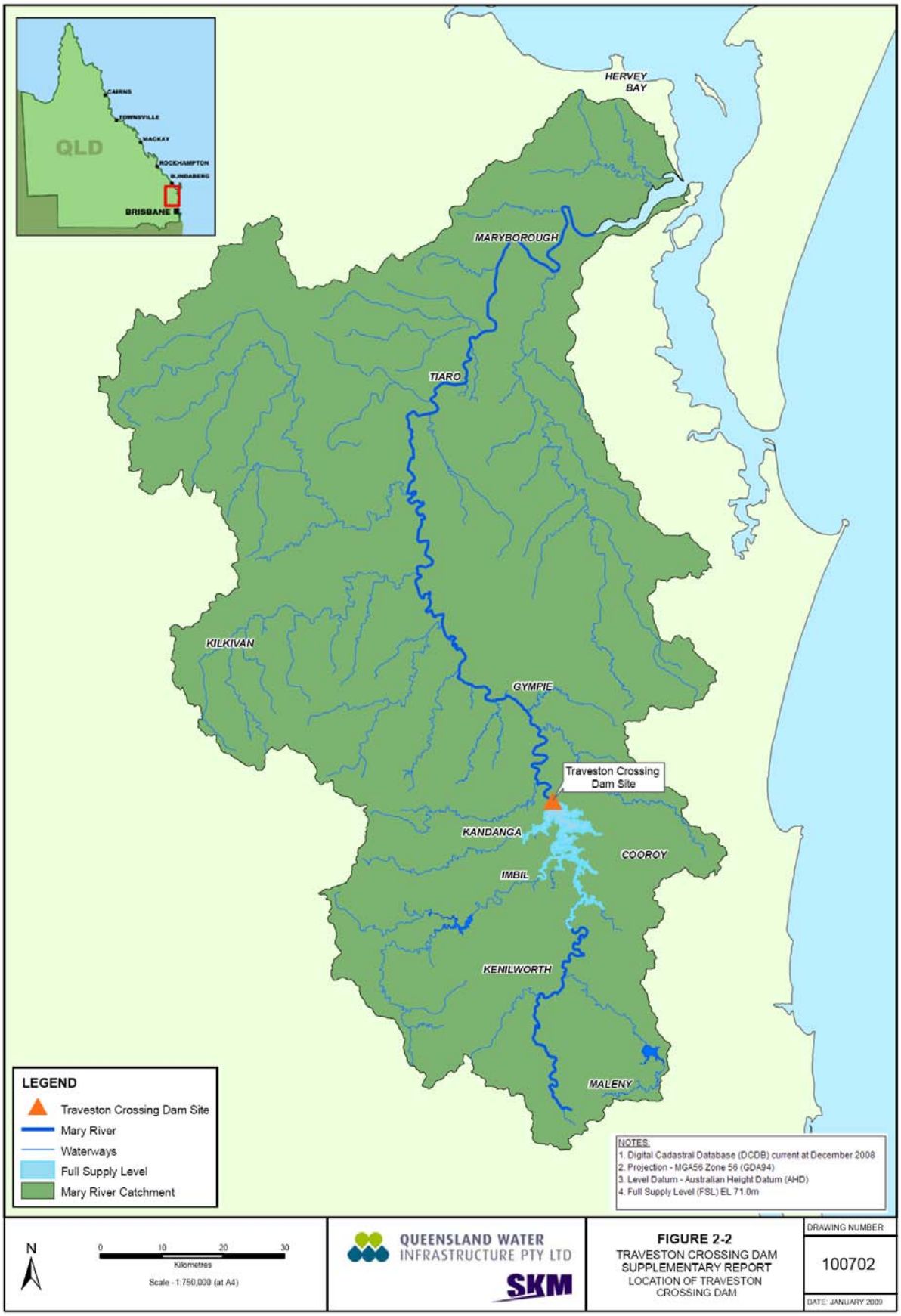
The proposal is for a storage of around 153,000 megalitres (ML), with an inundation area of approximately 3,000 hectares when full. At the completion of stage one, it is proposed to extract up to 70,000ML per year for urban water supplies. Stage 2 includes rising of the Borumba Dam providing with an additional yield of 40,000ML per year and operated in conjunction with stage 1, while Stage 3 involves raising of Stage 1 with an additional 40,000ML per year. The Qld Government has indicated that no decision will be made about pursuing a possible Stage 2 until around 2035, unless required. If Stage 2 is pursued, a separate referral and environmental impact assessment would be required [24].

[24] GHD Pty Ltd. SEQ Regional Water Supply Strategy-Desk Top Review of Identified Dam and Weir Sites, Summer 2006.

[25] Qld Water Commission's draft SEQ Water Strategy. Queensland Government. Department of Infrastructure, Spring 2008.



Map 1. Potential water grid for moving water between storage facilities in South East Queensland (Source: http://www.qwc.qld.gov.au/Water+Grid).



Map 2. Map of the proposed dam site and the Mary River Catchment (Source: http://www.qldwi.com.au/TravestonCrossingDam.aspx)

3.3 Legislation, Assessment and Decision-making Context

The Australian Government is responsible for protecting matters of national environmental significance listed under the *Environment Protection and Biodiversity Conservation Act 1999.*

These matters include:

- World Heritage properties
- National Heritage places
- wetlands of international importance
- listed threatened species and ecological communities
- migratory species protected under international agreement
- Commonwealth marine areas
- nuclear actions (including uranium mines)

The following sections of the EPBC Act have been triggered by the Traveston Crossing Dam proposal:

- Sections 12 and 15A – the World Heritage values of Fraser Island
- Sections 16 and 17B - the ecological character of the Great Sandy Strait Ramsar wetland
- Sections 18 and 18A - threatened species such as the Australian lungfish, Mary River cod, Mary River turtle and southern barred frog
- Sections 20 and 20A - listed migratory species including migratory shorebirds, the green turtle and the dugong.

The Traveston Crossing Dam referral to the EPBC Act was submitted on 15 November 2006 by Queensland Water Infrastructure Pty Ltd (hereafter QWI). This makes them the 'proponent' of the action.

The Minister for Natural Resources and Water released the *Water Resource (Mary Basin) Plan* (WRP) in July 2006. The WRP is part of a water resource planning process that is required under the *Water Act 2000*. It involves an assessment of the current and future water needs of the area and establishes water allocation security objectives-these protect the existing entitlements from the effects of any future changes to water management in the

area. The Mary Basin Water Resource Plan announced a 'strategic reserve' (or unallocated water) of 150 000 megalitres per year to provide urban water supplies to Brisbane (via Traveston Dam). The Department of Natural Resources and Water has developed a Resource Operations Plan, based on the Water Resource Plan, which will set specific operating rules for the proposed Traveston Crossing Dam to ensure water allocation objectives and environmental flows are maintained. Under the *Water Act 2000*, QWI is legally required to maintain environmental, or flushing, flow events.

Traveston Crossing Dam is being assessed through an Environmental Impact Statement (EIS) and this process is facilitated by the Department of Infrastructure and Planning for the Qld Coordinator-General.

It is only after the Queensland process is completed that the project is submitted to the Australian Government Environment Minister for a decision under the EPBC Act.

Before any final decision is made on the project, a mandatory assessment processes must be undertaken. The potential for impacts regarding the Mary River turtle and other species has been recognized and for this reason, the Traveston Crossing Dam proposal was designated 'a controlled action' under the EPBC Act. In particular, a Senate Inquiry, by the Senate Standing Committee on Rural and Regional Affairs and Transport, was tasked with examining all reasonable options, including increased dam capacity, for additional water supplies for SEQ including:

- The merits of all options, including the Qld Government's proposed Traveston Crossing Dam as well as raising the Borumba Dam; and
- The social, environmental, economic and engineering impacts of the various proposals.

The committee received 249 public submissions from individuals and organizations, held public hearings in Gympie, Brisbane and Canberra and spoke or heard from people who are directly or indirectly affected by the various Qld Government initiatives which aim to secure future supplies [26].

[26] Senate Committee Report, Rural and Regional Affairs and Transport. "Options for additional water supplies for South East Queensland". August 2007.

As part of the mandatory assessment process, the Draft Environmental Impact Statement for the project was released for a period of public comment on 18 October 2007 and the comment period closed on 14 January 2008. Many critical comments were submitted during this period, drawing attention to impacts on threatened species and other concerns, such as the river flow modelling and its correlation with climate change, the mitigation and offset strategies, potential upstream flooding, the downstream impacts, aquatic weed growth, and the alternatives to the dam proposal.

At this stage, it is not appropriate for the Minister of the Environment to comment on the proposal, as the assessment of those impacts is still ongoing and his decision-making role has not yet begun.

The proponent, QWI Pty Ltd, has compiled a supplementary report in response to the issues raised in public submissions on the draft EIS. The draft EIS, together with this supplementary report, form the final EIS documentation presented to the Qld Coordinator-General. This information will be considered by the Coordinator-General who will then issue a report evaluating the EIS documentation and the project.

This report will assess the potential impacts of the project, all proposed mitigation measures designed to protect matters of national environmental significance and any conditions that will be applied by the Qld Government if they approve the project.

Once the report is finalized, the state assessment process is complete and the Coordinator-General will decide whether or not to approve the project under relevant State legislation. If the Coordinator-General approves the project, the report will then be formally submitted to the Australian Government and the EPBC Act decision making process begins.

In making a decision on whether or not to approve the proposed Traveston Crossing Dam under the EPBC Act, the Australian Government Environment Minister will consider all relevant matters, including: alternatives to the dam that are presented in the draft EIS; public comments on those alternatives; the proponent's response to those comments in the supplementary report and the Coordinator-General’s evaluation of these issues in the assessment report.

Once the Minister for the Environment receives the assessment report from the Coordinator-General, the EPBC Act decision making process begins.

3.4 Community context

Traveston Crossing Dam is located in the only catchment in or adjoining SEQ that has sufficient water available for urban use to establish a dam on this scale. However, local Mary Valley residents oppose the dam proposal for a variety of reasons including:

- the dislocation of the local community in the inundated area
- adverse effects on downstream communities
- environmental impacts such as removing one of the few remaining habitats for the vulnerable Queensland Lungfish, the endangered Mary River Cod and the endangered Mary River Turtle. The lungfish is of particular importance and respect to the aboriginal Gabbi Gabbi people.
- Flooding of the Bruce Highway
- inundation of primary agricultural land

Other major engineering concerns that indicate the dam proposal is flawed include:

- the geomechanics of the proposed site are not suitable for damming due to potentially significant leakage as a result of the predominantly sandy substrate
- high evaporation rates as the dam is shallow and will have a very large surface area [27].

[27] http://www.savethemaryriver.com/. Cited in May 2009.

Chapter 4. Theoretical framework

4.1 Social Research

Social research is either basic or applied. The former serves in advancing knowledge about how the world works and built/test theoretical explanations. The latter is designed to offer practical solutions to a concrete problem or address issues of concern.
A special branch of applied research is action research. Kurt Lewin first coined the term "action research" in about 1944, and it appears in his 1946 paper "Action Research and Minority Problems" [28]. In that paper, he described action research as "a comparative research on the conditions and effects of various forms of social action and research leading to social action" that uses "a spiral of steps, each of which is composed of a circle of planning, action, and fact-finding about the result of the action". Action research treats knowledge as a form of power and abolishes the line between research and social action. It is defined as one that has a primary goal to facilitate social change or bring about a value-oriented political-social goal. Most important characteristics that different types of action research share are: those who are being studied participate in the research process; research incorporates ordinary or popular knowledge ; research focuses on power with a goal of empowerment; research seeks to raise consciousness or increases awareness; and research is tied directly to political action [29].

4.2 Relationship between theory and research

Research becomes more valuable when we connect it to theory. Social theory can be defined as a system of interconnected ideas that organises knowledge about the world and helps people visualise the complexity in the world [29]. Researchers interweave a story about the operation of the social world (the theory) with what they observe when they examine it systematically (the data). Schutt [30] argues that theory helps social scientists to know what

[28] Lewin K. "Action research and minority problems", *Journal of Sociology Issues,* Vol.2. no.4, 1946. pp.34-46.

[29] Newman, W.L. *Social research methods: qualitative and quantitative approaches*. (Thousand Oaks, CA: Sage, 2000).

[30] Schutt R., *Investigating the Social World. The Process and Practice of Research.* (Sage Publications, 2006).

to look for in a study and to specify the implications of their findings for other research. Building and evaluating theory is therefore one of the most important objectives in social research.

The preferences of a researcher to different theoretical assumptions reflect different philosophies and thus different accounts of social reality. However, it should be clarified that the social scientific theory is not to be confused with the socio-political ideologies. Neuman [29] identifies similarities between theory and ideology in that they describe many events in the world, specify relations among concepts and explain what needs to be changed to alter conditions. But he also distinguishes that ideologies are regarded as antiethical by the scientific community being belief systems closed to contradictory evidence that resist change and cannot be directly falsified with empirical data and make normative claims. On the other hand social theory strongly seeks logical congruity, recognises uncertainty and welcomes tests and change.

4.3 Social Research Philosophies/Paradigms

Principles about ontology (What is the nature of reality?), epistemology (What is the relationship between the inquirer and the known or what is the nature of knowledge?) and methodology (What is the nature of human inquiry or How do we know the world?) [31] shape how the qualitative researcher sees the world and acts in it. Earlier in the introduction, the change of scientific paradigm from reductionism to a holistic way of exploring nature (or reality) has been presented, as well as the implication of these two different ontological perspectives in natural resources management.

Regarding social science, theoretical paradigms have evolved and shifted from a positivistic to a constructivist or interpretative direction (see Table 1). **Positivism** is a epistemology which represents that the only authentic knowledge is that based on actual sense. The purpose of science is simply to rely on what we can observe and measure in order to describe the phenomena we experience. A positivist views the researcher as being detached from what is observed, neither influenced nor interdependent on the other.

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[31] Lincoln, Y. S., and E. G. Guba, *Naturalistic inquiry.* (Newbury Park, CA: Sage, 1985).

Knowledge is based solely on observable facts; it is absolute, objective and equated with the truth. Learning is transferring what exists in reality to what is known by the learner.

The constructivist epistemology advocates there is not one reality out there to be measured. The interpretive social scientists believe that reality is socially constructed and the goal of social science is to understand what meanings people give to reality, not to determine how reality works apart from these interpretations. As Rubin & Rubin put it [32] searching for universally acceptable social laws can distract from learning what people know and how they understand their lives. Guba and Lincoln [31] suggest that in constructivism the findings of a study exist precisely because of the interaction between the observer and the observed that literally creates what is emerged from the enquiry.

[32] Rubin H. and I. Rubin. Qualitative Interviewing: The Art of Hearing Data. (Thousand Oaks, CA: Sage, 1995).

Table 1. Basic beliefs of alternative inquiry paradigms [34].

Issue	Positivism	Post positivism	Critical Theory	Constructivism	Participatory
Ontology	Naïve realism-"real" reality but apprehensible	Critical realism-"real" reality but only imperfectly and probabilistically apprehensible	Historical realism-virtual reality shaped by social, political, cultural, economic, ethnic and gender values; crystallized over time	Relativism-local and specific co-constructed realities	Participative reality-subjective-objective reality, co-created by mind and given cosmos
Epistemology	Dualist/Objectivist; findings true	Modified Dualist/Objectivist; critical tradition/community; findings probably true	Transactional; subjectivist; value mediated findings	Transactional/subjectivist ; Co-created findings	Critical subjectivity in participatory transaction with cosmos; extended epistemology of experiential, propositional and practical knowing; co-created findings
Methodology	Experimental/manipulative; verification of hypotheses; chiefly quantitative methods	Modified Experimental/manipulative; critical multiplism; falsification of hypotheses; may include qualitative methods	Dialogic/dialectical	Hermeneutical/dialectical	Political participation in collaborative action inquiry; primacy of the practical; use of language grounded in shared experiential context

4.4 My theoretical proposition/position throughout the research process

Exploratory research seeks to find out how people get along in the setting under question, what meanings they give to their actions, and what issues concern them. The goal is to learn "What is going on here?" and to investigate social phenomena without explicit expectations. This purpose is associated with the use of methods that capture large amounts of relatively unstructured information or take a field of inquiry in a new direction.

The present study has been relied on a social science basis. The overall objective has been to enter in the community of the Mary Valley and engage in an exploratory and learning process related to the issues emerged from the proposal from the previous Qld State Government to build a dam in Traveston Crossing on the Mary River.

However, before exposing the research questions, it is meaningful to describe the initial and the final steps of my theoretical orientation.

4.5 Research Proposal/Initial expectations

At first, it is important to explain my theoretical point of departure. My ontological and epistemological stance had been crystallized within a social constructivism perspective [33]. The constructivist paradigm extends interpretive philosophy by emphasizing the importance of exploring how different stakeholders in a social setting construct their beliefs [34]. Therefore the research proposal was guided by a theoretical framework in which knowledge and stakes are generated experientially and that "different realities" are co-constructed locally of the people (individuals) or groups, while continuously changing.

Constructivist inquiry uses an interactive research process, in which a researcher begins an evaluation in some social setting by identifying the different interest groups

[33] Berger, P L and T Luckmann. *The Social Construction of reality*. (New York: Penguin, 1966).

in that setting. The researcher goes on to learn what each group thinks, and then gradually tries to develop a shared perspective on the problem being evaluated [34]. These steps are implying a circular process, the hermeneutic circle, where the constructions of a variety of individuals-deliberately chosen so as to uncover widely variable viewpoints-are elicited, challenged and exposed to new information and new more sophisticated ways of interpretation, until some level of consensus is reached [34].

The motivation to conduct the present research had been grounded in the foundations of the Integrated Water Resources Management context. An essential principle of doing research in this field suggests an integrative way of viewing water related issues-that is including the interrelationships among ecologic, economic and finally social dimensions of an issue. IWRM promotes approaches of stakeholder participation and facilitation in all levels of Water Resources Management. Given facilitation, stakeholders can be engaged in a collective learning process and would therefore build the capacity towards a community-based or negotiated management as Engeström [35] has concluded.

In line with the above ideas, I had taken the initiation to conduct an action related research in the Mary River Valley. The proposed action to build a dam in Traveston has brought up contrasting views among the people who have direct or indirect stakes about the above dam proposal. The social climate around this case was of particular importance in my research preconceptions, as I was eager to identify and engage stakeholders and myself in a shared process of learning about their stakes, their issues of unease and their visions after the announcement of the dam proposal. The initial research question was '*How can local knowledge and practices of the people in the area of the Mary Valley become explicit, as a need for learning before taking action/position?.* For this reason, the first step of the research proposal was guided by

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[34] Guba, E. G. and Y. S *Lincoln, Paradigmatic controversies, contradictions, and emerging confluences*, in: N. K. Denzin & Y. S. Lincoln (Eds) *The* Sage *handbook of qualitative research* (3rd edn). (Thousand Oaks, CA: Sage Publications, 2005).

[35] Engeström, Y., *Making expansive descisions: an activity – theoretical study of practioners building collaborativ medical care for children, in K.M. Allwood and M. Selart (eds), Decision Making: Social and Creative Dimensions.* (Amsterdam: Kluwer, 2000).

the intention to facilitate and bring stakeholders with opposing interests around the dam proposal in the same "social space" so that they can share their concerns and state issues together. Once the most important issues were going to be identified, a phase of conceptualising what could be done in order to reach a commonly agreed desired state would follow.

As far as my role in the research was concerned, it would not be a neutral one, as action research is not value-free. Within the context of this co-learning, I was not expected to be a detached observer, but become subjective and participating in the process of taking action against the dam along with the action groups in the Valley that aim to stop the proposal from being fulfilled. Through these proposed ideas of acting within my research, I expected myself to be a part of adding in the improving of public awareness within different stakeholder groups in the Mary Valley. However, action to me was not perceived as taking immediately the role of an activist and working along with the agenda of the anti-dam activists to stop the dam from being built, neither implying a responsibility to intervene with the expectation of improving any conflict situations. The intention was simply focused on a contribution to involving opposing stakeholders in a reflection and learning process about their conflicting interests and experiences regarding the challenge of the dam proposal.

4.6 Developing a new research orientation

Since my enter in the community in the Mary Valley and in particular in the area where the proposed dam was suggested to be build, I came to realise that my initial action-oriented direction was not feasible or appropriate due to the following reasons:

- Action research is an iterative process involving researchers and practitioners acting together on a particular cycle of activities, including problem diagnosis, action intervention, and reflective learning.

  Once the dam proposal was announced in April 2006 the State Government started a series of consultation meetings in the proposed affected towns. The appointed consultants were later to face people living in the Mary Valley

anxiously asking critical questions about the future of their land, life and the feasibility and impacts of the proposed dam. The questions of the potentially affected people were not answered and the consultation process seemed rather as some informing of a decision-making rather than an opportunity to gain feedback by the local people. Moreover, the way the dam was announced was probably the primary source of the immediate local reaction-it was announced on the TV news, without any prior information. Within this community frustration, one of the first groups against the dam proposal was built: the Save the Mary River Coordinating Group (hereafter STMRCG). This group emerged as an immediate community response to the announcement of the proposal and till now has overtaken a considerable amount of activities to overturn the decision.

It is therefore evident that the dam proposal had been brought up in the surface by the community as the most crucial issue in the Mary Valley. This is why a problem diagnosis was unnecessary and thus the dam proposal was selected a priori as the issue in the present research. However, my previous ignorance while writing a proposal from distance did not allow me to realise that any intervention, as previously defined from my research side, was rather trivial, because action had already been taken. Not only the community was mature and aware of the involved stakes but also opposition was institutionalised.

- As Avison et al. [36] have already stressed as part of their definition of action research, researchers and practitioners working together need to share a mutually acceptable ethical framework.

After my first encounters with the situation in the proposed dam footprint area I realised that the "air hanged heavy" and had to be really cautious about defining ethics. A short description of what I initially sensed is: a disintegrated community, with most of the land sold out, the original land owners moved away and those left quite discouraged and intimidated to talk about the dam. In the meantime, the action groups were being alert in providing information and protesting against the proposal while few who seemed to accept the dam proposal in the area were not

[36] Avison DE, Francis L, Myers MD and PA Nielsen, "Action research", *Communications of the ACM.* 1999. vol. 42. no. 1. pp. 94-97.

eager to confront or reveal themselves to the "other side". That led me to conclude that the community was not emotionally open for a mutual confrontation and concern sharing nor prepared to work together on the same ethical conditions.

The following question was if not action research then what?

Rather than planning any interventions I approached a more realistic idea-that is a case study research. As Avison et al. say such research frequently reports what practitioners *say* they do. In action research, the emphasis is more on what practitioners actually do.

The research was therefore directed in a basic exploratory basis. The objective remained still as one of exploring the stakes and interactions of the different stakeholders in the area where the dam is proposed to be built, but the ultimate goal was to make an exploration/interpretation of the different worldviews and the knowledge of the people, as these had been constructed after the dam proposal was announced. Moreover, rather than intervening and bringing opposing stakeholders in a shared learning and reflection space the goal had been shifted in going through a meta-learning exploration-that is how stakeholders have come to gain knowledge about the river and the dam proposal. Finally, the last step of this research has been an attempt to reflect about the learning process and outcomes from the researcher's side.

The above scope has remained within the constructivist theoretical approach. However, the methodology did not have to involve people in action throughout this research. It could rather be done by the researcher's individual efforts to capture people's perspectives and then build concepts of their worldviews.

4.7 Choosing a role

The specifics of a social situation studied, the researcher's background, the larger socio-political context and the ethical concerns determine what balance to strike between observing and participating throughout a research [30]. Choosing a role in the present research has gone through a critically reflecting process and maintaining it

had many times been challenged. In the attempt of redefining this role, various informants of different positions in this research encouraged me to be objective and try to see all sides, while some of the anti-dam informants seemed to have taken my scientific solidarity to their activities for granted.

The exploration of the world started with me being an overt observer, stating my role and intentions to the people, yet attending but not participating in any group activities: "I am a researcher. Can you tell me why do you participate in these activities and how?"

4.8 Identifying the Research Questions

The above process of reflection has been essential in developing the research questions. As it has been mentioned before, the goal has been to engage in a learning process: to learn about the complexity of the issues arising from the Traveston dam proposal, the learning environment and processes around this proposal and finally the researcher's reflections on the above. In particular, the learning account of this thesis has been twofold, the emic-that is, from a hermeneutic perspective, "reality" given as an interpretation of the text as it was provided by the subjects of the research and the etic-which relied on my reflective account of the setting. As Pike [37] has noted, the native members of a culture are the sole judges of the validity of an emic description, whereas the scientists are the sole judges of an etic description.

- The emic part of the research involved two basic exploratory research questions:
    1. What dilemmas have emerged after the announcement of the dam proposal and what meanings do people attach to them?
    2. In what learning processes have people in the Mary Valley been through, what has been learnt after the dam proposal was announced, and how this knowledge became explicit?
- The etic part involved two meta-analysis exploratory research questions:
    3. What have I learnt throughout the process of this thesis?
    4. What is my thesis (θέσις = position) throughout the research process?

[37] Pike K., *Language in relation to a unified theory of structure of human behavior* (2nd ed. The Hague: Mouton, 1967).

Chapter 5. Methodological Framework

5.1 A qualitative case study approach

Qualitative research employs qualitative methods, that rely on written or spoken words or observations that do not have a direct numerical interpretation and typically involve exploratory research questions, inductive reasoning, an orientation to social context, and the meanings attached by participants to events and their lives [30]. Methods as such are participant observation, intensive interviewing, and focus groups that are designed to capture social life as participants experience it rather than in categories predetermined by the researcher.

The learning environment of the proposal to build a dam in Traveston Crossing has been selected as a case to study. Case study is not a methodological choice but a choice of what is to be studied [38] but in the present research it has been concluded to be both. Qualitative case study calls for an examination of the complexity of the context. Lincoln & Guba [31] have pointed out that much qualitative research is based on a view that social phenomena, human dilemmas and the nature of cases are situational, revealing experiential happenings of many kinds.

5.2 Grounded theory

Qualitative research and in particular exploratory is often inductive. In inductive research the researcher begins with specific data, which are used to develop (induce) a general explanation (theory) to account for the data. Therefore, it proceeds from observation to theory and the starting point is to explore open questions. In deductive analysis, reasoning from specific premises results in a conclusion that a theory is supported, while in inductive research, the identification of similar empirical patterns results in a generalisation about some social process.

Due to the exploratory context (learning and meta-learning goals), the present qualitative research was based in a methodology were the aim was to create a

[38] Stake, R. E. *The art of case study research*. (Thousand Oaks, CA: Sage, 1995).

grounded theory-that is, to build up inductively a systematic explanation that is grounded in, or based on, the observations. As Strauss and Corbin point in their definition [39], grounded theory is a methodology, a way of thinking about and studying realities. However, Punch [40] extends the definition for grounded theory being a strategy for research and a way of interpreting empirical materials or analysing data.

The basic idea of the grounded theory approach is to read (and re-read) a textual database (such as a corpus of field notes) and "discover" or label variables (called categories, concepts and properties) and their interrelationships. In the development of theory, continual interaction between participants, empirical materials, researcher and interpretation takes place to further "ground theory" [39].

In the present study, rather than testing a hypothesis, I focused on making sense of people's experiences after the announcement of the dam proposal. And as observation, interviewing and reflection were taking place, the definitions of the research questions were being refined. As Brewer& Hunter [41] conclude, the idea is to let the question emerge from the situation itself, and this is what happened initially. Since the social world functions as an integrated whole, it has later been attempted to explore it by analyzing parts of it and then make a synthesis/explanation about the way it is constructed. Therefore, the different dilemmas around the dam proposal were analysed as parts of one problématique-that is the combination of various but interconnected aspects of the dilemma account. Emergent concepts or characteristics of each dilemma were discussed, so as to build an explanation of how the people view and experience them.

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[39] Strauss, A. and J. Corbin, *Basics of qualitative research: Techniques and procedures for developing grounded theory* (2nd ed.). (Thousand Oaks, CA: Sage, 1998).

[40] Punch, K. *Introduction to social research: Quantitative and qualitative approaches.* (London: Sage Publications, 1998).

[41] Brewer, J. & Hunter, A. *Multimethod research: A synthesis of styles.* (Newbury Park, CA: Sage, 1989).

5.3 Methods of data collection

5.3.1 Locations

The issue of interest of the research has been the dam proposal. This is an issue of unease that concerns not only people in the Mary river catchment, but also residents of Brisbane or other States or countries. The boundaries of this research are flexible; however there have been some places and people of particular backgrounds that have been chosen to be interviewed. At first, I started travelling from the sources of the river (Crystal Waters and Maleny) and then moved to Kandanga, which is one of the major towns (along with Imbil and Carters Ridge) within the dam footprint area that would be flooded in Stage 1 of the dam construction (See Map 2). I have spent most of my time in Kandanga for two reasons: a) it is the place where the Save The Mary River Coordinating Group (STMRCG) is based and b) a great range of stakeholders were identified to live or travel to this place; therefore it was convenient to capture a variety of information. Finally, discussions were carried out with residents of Gympie, which is a town downstream the proposed dam, where the Mary River Coordinating Committee (MRCCC) is based. I have not discussed with landholders of towns further downstream the proposed dam site, because of time limitations.

5.3.2 Informants

At the beginning of this study the world seemed fuzzy and informal conversations were frequent with the local people in the places were the research took place, so as to obtain the first objective and the key-informants. Once the key informants were identified, a purposeful process of finding different informants begun, as each informant referred me to other related ones. These references were filtered according to my research objective. For example, although there were many people I was referred to talk to, who were affected by the dam proposal, however they were not intensively pursued while interviewing, as the present study is not an impact assessment neither an evaluation research.

The informants included a range of people involved in different activities: local landholders in the mentioned areas of research, who either did not sell their properties

to the Government or intended to sell it, affected or not affected by the dam proposal landholders, people being involved in action groups as the STMRCG, the MRCCC, the GMA (Greater Mary Association) or other local associations as the (Mary Valley Incorporated) MVI. The above groups were identified as being relevant to the first research question, as they cover a variety of stakeholders, whereas a special interest in the people acting in the STMRCG was given for the purpose of the second research question.

5.3.3 Tools

- ***Interviewing***

Interviewing was used throughout the research as a main method of obtaining information and the types of interviews varied depending on the context and the research questions.

As far as the first research question is concerned, semi-structures interviews were made. These ask certain specific major questions but the interviewer is free to probe beyond them as he sees fit [42].

The semi-structures interviews involved the following questions:

1. What is your **stake**? In what way will you be **affected**?
2. How do you **feel** about it?
3. How do you explain the dam proposal from a **political** point of view? Why does the government want to **continue on this project even if there is such a local opposition?**
4. What is you **vision- dream**? What could be done? How?
5. What is your opinion on the other **alternatives** that are suggested by the people who do not wish the dam to be built (as desalination, water recycling and rainwater harvesting).
6. What **changes** in terms of activities, behavior, have you seen after the dam proposal was announced?
7. What are the **lessons** that you have learnt through your interaction with a) the **Government** b) the people in the **community** c) the members of the **STMRCG?**

[42] Benney. M and E. C. Hughes, "Of Sociology and the Interview", *American Journal of Sociology,* 1956. vol. 62, pp. 137-142.

Regarding the second research question, open-ended interviews were used as well as participant observation. The open-ended interviews were used to allow a freer expression of ideas of the members of the community groups.

- ***Participant observation***

Participant observation encourages researchers to immerse themselves in the day-to-day activities of the people whom they are attempting to understand. In most part of the research, due to my role being that of a *participant as observer*, observation employed unstructured interviews as a routine part of its practice. As Schutt [30] has pointed out these two methods are compatible: observation guides researchers to some of the important questions they want to ask the respondent, and interviewing helps to interpret the significance of what researchers are observing.

The activities in which I took part as an observer were the "train days" (an information dissemination process to the tourists who made a 20 minutes stop in Kandaga passed their way to Imbil with the steam train) , the weekly meetings of the STMRCG and the State pre-election rally/leaflet distributing in Brisbane on the 17th of April 2009.

- **Other tools**

A ***CATWOE Analysis*** was one of the first tools to apply in order to identify who are the stakeholders, if the dam proposal is defined as the transformation process.
Rich picture (systems diagram) was used as a way to depict in a systemic way the codes and concepts while building up categories and grounded theory. It has been useful to cluster and represent the concepts and their interrelationships.
A ***Matrix*** was created for the first research question to summarize and document the information obtained from different interviewees. The matrix comprises the information of all the meetings. In the rows the information of each interviewee (state of interviewee, location and date) is allocated, while the columns contain the topics of each question as listed in the interviewing above. The words in bold as written above were used as key words in the topics of the columns.

- **Reflection journal**

A reflection journal was kept every day in order to make a meta-analysis of my learning. This has been a constructive way a) to answer the third and fourth research questions as well as b) to critically reflect about the whole research process, from the theoretical perspectives, the methodology, the application of tools, the data analysis to the text writing, so as to be flexible in making decisions about structuring the research.

The reflection journal had the following structure:

1. What have I done today?
2. How did I feel?
3. What have I learnt?

5.4 Research Ethics

These have been some general ethical principles that guided the present research:

- All names of people were anonymised (or fictionalised). That is, a **principle of confidentiality** underlies all research transactions. Accordingly no-one had privileged access to any data and files.
- All interviewers had the right to say 'no' to an interview request, or an interview at all, the right of reply and the right to have a voice in the affairs of any research which affects them. These rights refer to the **principle of freedom** fundamental to human rights. For example informants who I tried to contact with by phone rejected my request to talk about the dam proposal, as they had sold their properties and did not wish to engage in any interactions as such.

Chapter 6. Discussion

6.1 What are the dilemmas?

6.1.1 Resource dilemmas

As outlined earlier in the Introduction part, resource dilemmas are characterised by the competing claims made by multiple stakeholder groups, each with their own optimisation strategies, theories and life-worlds [3].

Regarding the meanings that people attached to the Mary River, there have been two basic lines-that is the river is not a resource, but a natural asset vs. the river is a resource.

For those who accept the river as a resource, however, there were two divergent ways of considering it. One of them is a rather egocentric view that the river is a resource that we can use to build a dam for economic development and growth or to manipulate for political purposes. From an ecocentric perspective, we can use the river as a resource that we can manage in a sustainable way. This usually implied the idea that rather than planning mega-projects of inter-basin water transfer we could instead plan for infrastructure (such as weirs, piping recycled water into existing reservoirs) to cover the needs of the people within the catchment while sustaining the necessary environmental flows and protecting the river's creatures.

6.1.2 Technical dilemmas

The diverse views of seeing the river were related with different perspectives regarding the water resource management practices. The conviction of the government that we need to build a dam in Traveston because we have to meet the projected needs of water in the fast growing SEQ was supported by research done by the "experts/engineers". This idea was based on the ground that the Traveston dam is a good solution, as part of the water grid, because the Traveston Crossing is a part of the river that is draining a relatively big catchments (see map 2), therefore it would store large volumes of water.

Contrary to this, there have been two more perspectives in the Mary Valley-that is a) there is either no need for dams at all, because they stop the flow of the river, therefore their ability to feed life vs. b) although building a dam is good idea to come out of the water crisis, however, the location in Traveston is problematic, because of the alluvial sediment (which would result in high seepage of water to the ground) and the low slope (which would result in high evaporation of the water and weed infestation).

The alternatives that were suggested from the STMRCG are household and industry demand reduction, household installation of water-saving devices, storm water harvesting, rainwater tanks, recycling waste water and desalination. These alternatives have some characteristic in common, they do not involve loss of fertile land neither dislocation of communities and do not affect the rivers' ecology and morphology. Most of those interviewed regard rainwater tanks as necessary in each house, because of the high rainfall in SEQ. However, it has been noted that desalination is "another industrial monstrosity", because it is based on the same technocentric mindset as building a dam. Finally, it has many times been stressed by the interviewees that building dams is an old-fashioned technology.

Despite the above alternatives, local landholders exposed different ideas to the Government that suggested different ways to store water or raise existing storages. These are based on the experience of the hydrology of the catchment which has not been taken into account by the technicians while designing the Mary Basin Water Resource Plan. These are outlined below:

- Raising Borumba dam (which stores water from Yabba Creek) by 25 metres to provide additional supplies only for the Mary River system and the Sunshine Coast and construction of storage weirs on the Mary River (in Moy Pocket or Coles Crossing) as was previously concluded in the "Appraisal Study of Water Supply Sources for the Sunshine Coast and the Mary River Valley" [43] and later

[43]Appraisal Study of Water Supply Sources for the Sunshine Coast and the Mary River Valley" . Executive Summary. Queensland Department of Primary Industries, 1994.

discussed during the Water Resource Planning process [23]. This is has been a plan that does not involve any inter-basin water transfer.

- Collect the storm water by small dam weirs in Brisbane and pump it back to dams (like the Wivenhoe/Sommerset dam system which is one of the main water storages for Brisbane) or to the river. These small dam weirs in Brisbane could also be filled up with recycled water. Another suggestion involves constructing small meanders that would ultimately direct the water to be stored in dams or percolate slowly to the ground. As people said "We have to offset the geomorphological changes we have made by concretising the landscape, especially in the cities. We have enough dams; we just have to fill them with water." The idea of treating water and pumping it to Wivenhoe/Sommerset dam system was shared by many others, as this would be less distance than pumping water from Traveston Crossing to Brisbane.
- A suggestion to build a new dam 3km downstream Borumba dam to create storage that includes little Yabba Creek and Bella Creek .
- The suggestion by a local beef cattle producers to build another dam 300metres in front of the existing Borumba dam with a wall as high as possible. Then one or two opening boom gate weirs could be built on suitable locations, as the Moy Pocket or Coles Creek. If further water is required these boom gates would be closed when the river is flowing in abundance and water be pumped from them to Borumba via a pipeline and pumping station. Thirdly, a pipeline could be built from Sommerset/Wivenhoe dam to Borumba dam in order to transfer water within the two dam systems according to the changing demands and available water storages in Brisbane and Mary Valley respectively. A hydro-electricity plant in Borumba dam would supply power for the pumping stations (from Submission to the Senate Inquiry from Ron MacMah). This would not displace people, but was viewed by others as a plan that would flood primary agricultural land.

A technocentic and holocentric set of worldviews has emerged out of the technical dilemmas around the Traveston dam proposal. The wealth of experience as described above is characteristic of the fact that reality and nature is contextual when it comes to science and engineer planning. Multiple versions of local knowledge in this case

revealed that the context of geography, hydrology and community of the Mary Valley does not support building a dam in Traveston Crossing, which seems to be a single perspective technical answer. On the contrary, a holistic consideration of water resources management is a dynamic process, appreciative and inclusive of the local context, in terms of the indigenous experience as well as people's feelings, rather than one that imposes the same static technological solutions.

Bawden has concluded in distinguishing some worldviews in terms of seeing the world with a reductionist vs. a holistic ontological dimension as well as with an objectivist vs. a contextual epistemological dimension.

Holism

Objectivism		**Contextualism**
	Ecocentric / ***Holocentric***	
	Technocentric / ***Egocentric***	

Reductionism

Table 2. Bawden's Worldviews Perspectives of the Environment [44].

6.1.3 Stakeholder dilemmas

From a CATWOE analysis (see Table 3) two conflicting stakeholder groups exist with the dam proposal defined as a transformation process: the beneficiaries and the victims.

[44] Bawden, R.J. "Systems Approaches to Agricultural Development: The Hawkesbury Experience" *Agricultural Systems*, 1998, vol. 40. pp. 153-176.

Table 3. CATWOE Analysis. [C, A, T, W, O, E stand for Clients (Beneficiairies and Victims), Actors, Transformation process, Weltanschauung, Owners, Environment respectively. Clients, Actors and Owners are the stakeholders involved around the dam proposal].

Transformation Process ("T") *(Conversion of input to output)*	**Proposing a dam on the Mary River on Traveston Crossing**
Inputs of "T"	Engineers' expertise, political bargaining
Outputs of "T"	Local opposition, land purchasing from QWI, fragmented communities and businesses, potential win of votes
Beneficiaries of "T"	State Gvnt Candidates, SEQ people who were promised water, temporary renters in Kandanga, Businesses reform, local landholders who sold+invested, QWI working for Gvnt, Construction business
Victims of "T"	Local landholders who are pressured to sell, those who sold out and lost businesses, farms, homes and were emotionally, financially, mentally impacted by proposal, Real Estate businesses and local market, the Mary River and its creatures
Actors – those who do "T"	Qld State Government, QWI, Construction Companies
Owners –those who could stop "T"	Premier of Qld, Co-ordinator General of Qld, Federal Government under EPBC Act
Weltanschauung or World-view- Organizations or platforms (world-views) that indirectly and in a global level make **"T"** meaningful in context	National Water Initiative (NWI) (…….)
Environment Constraints-elements outside the system (which are taken as givens)	Climate change crisis

The stakeholder dilemmas around the dam proposal involve the different realities of various stakeholder groups about what is a resource (resource dilemmas) and what is at stake (beneficiaries vs. victims). Thus, the dam proposal has been defined as an issue of concern throughout this research and not as a problem, because not all stakeholders perceive it as problem. Subtractability is apparent, as use of the resource from one stakeholder group subtracts the benefits of enjoying this resource from another group. As one person said, "people in the Valley felt betrayed and people in Brisbane free of the anxiety of running out of water".

Different informants gave various explanations of what is their stake. People who were not affected financially or physically by the dam proposal considered themselves as victims of both a flawed proposal and a flawed perception of managing water. The proposal was seen not only as something that would put the humans, the catchment and its creatures at risk, but also as a situation of encouraging people to consider it as a given solution. Therefore, definition of stakes extended from an interest of having different benefits and lifestyles related to the Mary River (catchment related stakes) into an interest of having contrasting worldviews regarding water management practices (sustainability related stakes). As one person said "They encourage people to think that water will come from the tap. They have promised to build the dam in order to release citizens of Brisbane from water restrictions. After high rainfall this summer, water restrictions in Brisbane were raised and that was unfortunate, because people in Brisbane had learnt to be water wise."

Uncertainty has been a main issue throughout this proposal, not only in terms of the environmental challenges and climate change, but also in terms of how it influences people's emotional state. The victims of this proposal find it hard to fight with the uncertainty, manifested as a state of not knowing whether and when the proposed dam is going to be approved, yet observing land being purchased.

6.1.4 Institutional dilemmas

a) Top-down vs. bottom-up governance

Before the Traveston Crossing Dam proposal was announced, community and landholder participation in caring for the river had been exemplary and bottom-up managing of the river took 20 years to be established. Community initiatives had ended up in an Integrated Catchment Management project in 1997. The outcome of this catchment project was the Mary River Catchment Strategy. Millions of dollars in government funding had been then allocated for river restoration, as one part of the Strategy. In 2004 the Mary River community was awarded the coveted National Rivercare Award for implementing the Mary River and Tributaries Rehabilitation Plan.

The Traveston dam proposal came as a top-down decision. The announcement was made on the TV news and as many people said it was both a shock and an insult to be informed about it that way. No prior consultation had been done and later the Government failed to adhere to acceptable processes of public involvement in the assessment and management of the social impacts [45].

Productive partnerships between government, landholders, industry groups and the wider community have been fragmented. The question is whether a bottom-up way of managing the catchment will become prevalent again, as since the proposal was announced, landholders and business owners within the proposed dam footprint area have been severely impacted and the impetus for work on river restoration and sustainable land management has been lost.

b) Private water selling vs. self-sufficiency

Most of those interviewed from the sources of the Mary River till Gympie stressed the same wish-that is we want to be self-sufficient in terms of water and food. As some of them explained, the Water Grid is a good idea to sell water and to distract people from self-sufficiency, whereas there is enough rainfall for each house to have full water tanks in SEQ. Moreover, people cannot understand why they this fertile agricultural land would be flooded and Queensland be dependent on importing food from other states or countries.

c) *Public Experts vs. Expert Public* [46]

Expert and local knowledge are placed in the context of institutional dilemmas because, as it has been mentioned before, collective learning processes, emerging from stakeholder interaction, have been considered as an alternative way of governance in natural resources management.

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[45] Hales R., *A discussion Paper on the QLD Government's Assesement and Management of the social Impacts of the Proposed Dam on the Mary River,* (Griffith University, 2007)

[46] Kinsella, W. J. *Public expertise: A foundation for citizen participation in energy and environmental decisions.* (eds S. P. Depoe, J. W. Delicath, & M. A. Elsenbeer, Albany, NY, 2004).

Technical expertise is a prerequisite for people to become motivated in a process of "communicative competence" [47] but as Fisher [50] notes the public moral argument in the discourse about environmental issues collapses in a narrow conversation dominated by technical expertise. Citizens of Queensland had the opportunity to reveal their reasons and experience why the dam should not proceed in the public submission period for the EIS and the Senate Inquiry, but that was after the proposal as announced and land had already started being purchased. As Laird [48] has pointed, attempts for direct citizen engagement in environmental decision-making processes "provide hollow participation in which citizens merely make noise in some political ritual rather than real influence over outcomes".

The disempowerment of the people in the Mary Valley has caused a conflict of interests between them and the Government. People felt angry, shocked and disappointed of the insufficient research done before this quick proposal was announced. Moreover, they were even more frustrated later, because the Government did not accept that the project would be unfeasible and unnecessary, even though people supported their arguments with sound scientific research. Thus, disempowerment is discussed as a concept arising out of the above institutional dilemmas. Empowerment and capacity building become a meaningful and constructive process only when indigenous knowledge becomes appreciated and contributing to institutional changes in water resources management. Then conflicts of interest around resources are more likely to be resolved.

6.1.5 Ethical dilemmas

Divergent values and rationalities about environmental issues generate moral conflicts[49]. The ethical dilemmas around the Traveston dam proposal were extended

[47] Habermas J., *The theory of communicative action,* (Boston: Beacon , 1983).

[48] Laird F., "Participatory analysis, democracy, and technological decision making. " *Science, Technology, & Human Values. 1993. vol* 18. no.3. pp. 341-361.

[49] Pearce, W. B., and S. W. Littlejohn, *Moral Conflict: When social worlds collide*, (Thousand Oaks, CA: Sage, 1997).

to dilemmas of how people visualise their future. The moral alternatives implied different axiologies, which deal with the meanings that people attach to their lives.

Those who were indirectly supportive of the dam proposal where aware of how wrong this proposal is, but at the same time visualised a Valley that would prosper and develop and wished to see their lives moving and adapting to a reality with a dam built, rather than focusing on what is wrong. Therefore, it would be meaningful to try and see how the community could find new dynamics and a redefined lifestyle.

On the other side, the people opposed to the dam proposal justified their anti-dam position either because their property was at stake (NIMBY) or due to their strong environmental concerns. Their vision was completely different, in that they wanted to see the Valley the way it was, not socially fragmented. Moreover, their vision extended in seeing a unified, integrated catchment, revegetated banks, organic farming practices, decentralization and self-sufficiency. Finally, as one farmer has pointed "ensuring that our grandchildren would be able to enjoy a healthy river, otherwise we cannot say that we love them."

6.1.6 Political dilemmas

When people were asked how they explain the dam proposal in political terms, the answer was that this proposal was a political bargaining. Dams that feed Brisbane with water (the Wivenhoe/Sommerset dams) were extremely low in 2006 and Brisbane households were under high level water restrictions. During a pre-election period and the city of Brisbane under a severe drought and water restrictions the proposal seemed a good promise. Therefore, the dilemma that was exposed by the community in this case is whether we want political systems that count heads or ones that safeguard minority groups.

6.2 What are the learning processes before the dam proposal?

Participation is not something that just happens; it has to be organised, facilitated even nurtured [50]. For the Mary River Catchment it took almost twenty years to establish a

[50] Fisher F., *Citizens, Experts and the environment: the Politics of Local Knowledge*. (Duke University Press, London, 2000).

community-based management of the river. With the Landcare groups emerging in Australia during the late 80's, communities started self-organising in caring for the land at a catchment scale. In 1992 and after local groups showed interest in the health of the Mary River catchment, Qld Government established a pilot project of Integrated Catchment Management (ICM) on the Mary River. At that time ICM was seen in Australia as capable of offering a framework for the community, industry and government, and its various agencies, to work together to address issues of natural resources management, thus assuring long-term social and economic sustainability. A coordinator was appointed by the Qld Government to assist with the formation of the Catchment Coordinating Committee (CCC) and to facilitate the stakeholder meetings. Public meetings took place at Maryborough, Gympie and Kenilworth (from the lower to the upper reaches of the catchment) where key issues were identified and interest sectors which would be on the CCC were canvassed. People voted on their preferred representatives and direct ownership by the community developed to the formation of an ICM steering group in September 1993. Then one representative from each interest sector, along with three local authorities' representatives and two State government officers, formed the CCC. In the following years, the community of the Valley was able to reach a shared vision about the future of the catchment and a plan of how to make this vision true. The action plans of the ICM project ended up with the Mary River Catchment Strategies which included greater knowledge, research and education building, better land use planning, managing water quantity, improving land management practices, improving water quality, riverbank stabilization, improving legislation and procedures [51].

The community was seriously engaged in the implementation of these actions. Commitment became explicit not only through changes manifested in the river environment, such as the revegetated banks-one of the well-defined shared visions. It was also an emergent property of learning about the catchment. As Stevenson [52] recalls, people who never met before had to talk together in meetings across the

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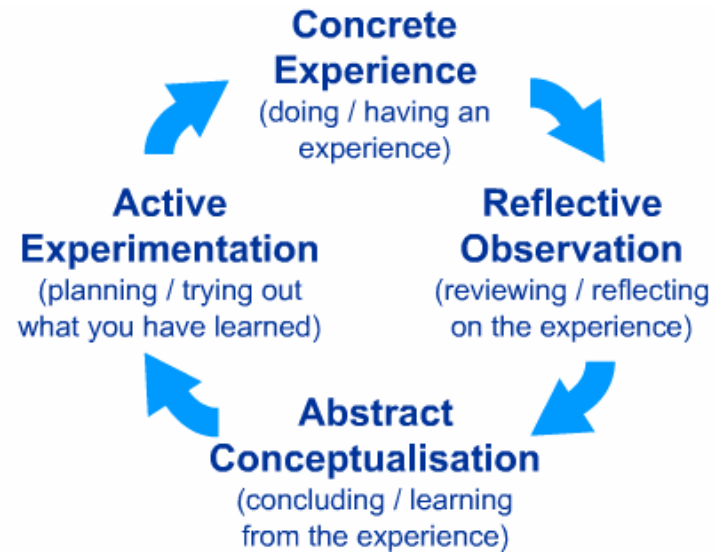
[51] Mary River catchment strategy. Mary River Catchment Coordinating Committee. Queensland. Department of Natural Resources, 1997.

[52] Stevenson T., Enacting the vision for sustainable development. *Futures*. 2008. doi: 10.1016/j.futures. 2008.09.008

catchment. And the MRCCC encouraged people to get to know their own terrain, by organizing canoe trips and other events in the field. Stevenson [52] described later the above ICM experience within an action learning framework that closely resembles the model of Morgan and Ramirez [53]. Action learning is rooted in experiential learning, which is what Kolb [54] calls the transformation of experience to knowledge. The stakeholders/interest groups of the Mary River Catchment were involved in a process of a learning cycle as such (Picture 1). With the aid of a facilitator they were able to go through the following steps of the cycle a) reflect what were the issues of concern in the catchment (reflective observation/observing), b) conclude what all these issues mean and distill them in categories (abstract conceptualization/thinking), c) imagine and come up with a desirable state (vision) in which the prioritized issues would be placed and make a plan of how to realize the vision (active experimentation/ planning) and finally d) implement the plan (which was the Mary River Catchment Strategy) (concrete experience/doing). The above cycle is an iterative process and once the community started taking action, new experiences, rearranged visions and plans were in place, therefore learning.



Picture 1. Kolb's learning cycle. (Source: http://www.ldu.leeds.ac.uk/ldu/sddu_multimedia/kolb/static_version.php)

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[53] Morgan G. and R. Ramirez, Action learning: A holographic metaphor for guiding social change. *Human Relations,* 1983. *vol.* 37. no 1. pp.1-28.

[54] Kolb D., *Experiential Learning: Experience as a source of learning and development.* (New Jersey: Prentice Hall, 1984).

Throughout the centuries, the flood culture has generated experiential knowledge about the river. People had to adjust living near a forceful river, with unexpected flooding events which interrupt transport, shopping or farming activities and inundate houses. But in the case of the ICM project, learning emerged as a response to a community seeking purposefully a change for the land and the river. This change was pursued in terms of creating a common language about (e.g.) what is river bank, where should the community intervene in restoring the river bank and finally why was that important for the co-existing of people and the river. Argyris and Schön [55] talk about single and double loop learning-that is learning that involves either changes in routine practices or changes in the underlying values and meanings we attach to these practices respectively. And essentially, this learning led the community in developing new institutional arrangements, either formal or informal. This was manifested in the MRCCC formation, which is a catchment managing group for the Mary River. The aim of the Mary River Catchment Coordinating Committee (MRCCC) is to promote within the community and through interested sectors, a common view of a sustainable and productive catchment. Key roles which promote the MRCCC's non regulatory and cooperative approach in achieving this aim have been determined. These roles are Education and Awareness, Planning (assisting Local Government) and assisting interest-sectors to adopt Best Management Practices [56]. As explained in the introduction, social learning is about bringing institutional changes and in this case the change implied a bottom-up managing of the river, inclusive of all stakeholders, as well as scientists and governmental authorities and at all stages.

6.3 Learning processes after the dam proposal

Since the dam was announced in 2006, the community entered in a state of crisis. As Stevenson [53] pointed out, the hasty decision to build a dam, with no public consultation, has "crunched" the feedback, the feedback loops recommended for action learning. When asked what lessons they have learnt after the dam proposal was

[55] Argyris C. and D. Schön, *Theory in Practice: Increasing Professional Effectiveness.* (Jossey-Bass, San Francisco, 1974).

[56] http://mrccc.org.au/. Cited in May 2009.

announced, almost all of the people said that they were deceived. The knowledge still remains but the will and trust to work with the Government for an integrated management of the river is disrupted. The main concern of the people in the proposed footprint area now is what will happen with the purchased land, even if the dam is not going to be built. What the people are afraid is the subdivision of the land, but they wish to see their community and river management restored.

6.3.1 Community groups emerged after the dam proposal

With the dam proposal announcement some community groups have emerged. The Save the Mary River Coordinating Group formed a few days after the announcement. STMRCG is a community support action group with a goal to overturn the dam proposal.

- It is a diverse group (political, scientific backgrounds), that means diverse networking and skills.
- It is lobbying, rallying, putting pressure on politicians and feeding Federal Minister of Environment with knowledge in order to reject proposal through the EPBC Act.
- Learning through action and challenges (Senate Inquiry submissions, EIS submissions, State elections, Paradise dam Court Case). In particular, trying to show to the Government and the people that we should not repeat the same mistakes from already built dams, as the downstream desertification in the Murray-Darling River or the failure of fish ladders functioning in the Paradise dam of Burnett [57] River. Signs of the anti-dam campaign like "Don't Murray [58]

[57] The construction of the Paradise Dam and a 'fishway' on the Burnett River in Central Queensland have been unsuccessful for the lungfish to travel upstream as well as downstream from the dam wall. The Wide Bay Burnet Conservation Council has taken this case to the Federal Court and this legal case may hold the last chance to ensure that Traveston is not approved by the Department of Environment, Water and Heritage.

[58] The Murray-Darling, a river system in South East Australia, is facing severe stress resulting from overuse and misuse (over allocation of licences) of water from the river and salinity problems arising from intensive agricultural irrigation along its banks. This led to the establishment of government initiatives aimed to change the way of how water is used.

the Mary" give an implication to how water management should draw from learning from mistakes-that is the idea of adaptive management.

Greater Mary Association

It was formed as an action group that involves downstream groups and exchanges information and networks closely with the STMRCG. After the dam proposal was announced, there was a need for the potential downstream affected stakeholders, such as the fisheries industry and farmers, to realise the downstream impacts and have a voice.

Save the Mary River Brisbane Group

It has also emerged, as a part of the Save the Mary River Campaign but acts within Brisbane, as the Traveston proposal is a water strategy for supplying water mainly in the city of Brisbane.

The anti-dam Campaign is also networking with other State, national or international groups. These are the landcare groups along the Mary River, but more particular is the exchange of knowledge with the Tiaro landcare group , because this is were the Mary River Turtle was found as an endemic species of the river. A very important scientific knowledge supplier is the MRCCC, as it was a community group formed within the ICM process. Other groups involve the Sunshine Coast Environmental Council, the Qld Conservation Council, the Australian Conservation Foundation, the Wide Bay Burnett Conservation Council, the Environmental Defenders Office and finally the World Wildlife Fund and the International Rivers Network.

The STMRCG was formed a few days after the announcement of the proposal and that was an instant community response to an imposed planning. The knowledge of the community about the river and how and why to care for the river, as a process motivated through the ICM project, must have prepared the ground for the formation of the STMRCG and the anti-dam campaign. The skills, knowledge and contacts were already there to organise a community group that represented a crystallized view of how the Mary Valley people perceived the catchment. However, other existing social networks in the Mary Valley interlinked indirectly with each other for the campaign

to arise. Some of these groups include the Neighbourhood Watch and arts groups with no formal interconnections.

Mary Valley Incorporated

MVI is a community group that appeared after the dam proposal was announced but has a different aim in that it is working on the development and promotion of local business and community activities and bond building in the Mary Valley. It is a top umbrella that represents communities that extend from Crystal Waters, Conondale, Kenilworth, The Ridges, Imbil, Kandanga, Amamor and Dagun. It was formed one year after the proposal announcement, as a top umbrella of the above communities, and as a response to a need of having a united voice to the Government, the Councils and the QWI. As one member of the MVI said "When the dam proposal came out and QWI started buying land, the town was fragmented and we needed to know how to become a strong entity that would be able to ask for assistance to restore the community in case the dam was not going ahead. Moreover, after the amalgamation of Councils we wanted to manage our own destiny and self-organize to foster local business".

6.4 What have I learnt?

- *The dam proposal is different from the dam construction*

The issue of concern of the current study has been defined as the proposal of the Qld State Government to build a dam on Traveston Crossing of the Mary River in SEQ. Although the issue seems very clear as such, however, at the beginning of the research I was confused with filtering information about the impacts of the dam, if it was built, and the impacts of the dam proposal. This was also important as to whether I should focus on interviewing people within the proposed dam footprint area, which is severely impacted by the proposal, or move further downstream till the mouth of the river, which is not affected by the dam proposal but would be certainly affected if the dam is going to be built. However, I was later clear with the informants that I am interested in the issues arising from the dam proposal.

The above clarification has not only been a result of a personal reflection process, but also emerging from my interaction with the informants. In particular, I was corrected from the first person that I interviewed not to express in terms of the dam, but in terms of the proposed dam. That was meaningful to me, as to being clear with my research objectives, as well as for the people of the Mary Valley. Those who are fighting against the proposal cannot accept that the dam is going to be built and the reality is that the dam has not been approved; therefore it is neither right nor correct to talk about a dam that does not exist.

- *That boundaries are moving targets*

Cultural systems of action refer to sets of interrelated activities engaged in by the actors in a social situation. The case studies referring to such systems must always have boundaries [38]. The boundaries around this issue had initially been drawn in geographical terms. Thus, I started interviewing landholders who would be potentially affected (or not) by flooding. Being much more concentrated on the proposed dam footprint area and the people living around it (Stage 1 and 2), I believed that they are considered as an important group of the stakeholders. However, I later realized that people who would not be affected, were the same concerned with those whose properties or businesses would be lost. The former perceived themselves as stakeholders due to their environmental concerns, they were taking part in the fighting against the proposal and they were living in places along the whole catchment, or even out of it. Therefore the boundaries became value-driven, rather than geographical.

- *That people have put their personal life aside in order to overturn the proposal. Why is it so important?*

The members of the STMRCC come from different backgrounds, as that of an engineer, a farmer, a landholder, a businessman, an agriculture/environmental scientist, a fisherman-researcher, a school teacher, a church servant. Each person has a unique personality and strong environmental concerns and contributes in a different way to the campaign (media, making signs, writing books or newsletters, networking and management of the group). Apart from the members of the STMRCG, there are also people who do not come to the meetings but are

indirectly involved in other ways as money providers, writing letters to the politicians, putting in submissions as an official way to have a voice, doing talk back radio, doing research and keep an eye on any change of the legislation.

The whole group of the above people has a great determination to stop the dam from being built and this has not been an easy task. Rallying, providing the public with knowledge and updates about the issues around the proposal and moreover becoming political (as in the state elections on March 2009) is done not on the basis of some routine environmentalism or a "tree hugger" activism. On the contrary, fighting the dam proposal has its roots on a clear and well justified objective, which has been supported by rational thinking. The statements that have been made from the STMRCG to the media do not just demand to stop a dam from being built, but explain the reasons of these statements and actions with a great credibility of data. As a member of the STMRCG has put it, the campaign does have a strong voice because it is founded on solid data and fact, inarguable logic and the conviction of so many people to save the river.

I have been amazed by the fact that so many people have invested energy and time in this campaign especially on the detriment of their personal life. That means that they believe this is important not for some personal interest or political agenda. They simply visualize a future with a healthy river; they find this a true duty.

- *That when people say that one is lucky to live in Australia, they say that because they think that the resources are unlimited? Are we still settling in to this continent?*

In one of the technical reports of the QWI website, it is mentioned that the Mary River has SEQ's largest mean annual flow and is also one of the most undeveloped rivers in terms of water storage infrastructure. This view suggests that we should not let water flow to the sea, otherwise it is wasted. The question is do we view the rivers as another commodity and Australia still as a great postcolonial pool of these unexploited resources? And is there a well crystallized post-colonial mindset of Australia being completely unique or are we still transferring the water management practices from the metropolitan/European context? Are we short of water in SEQ or are we short of knowing how to manage water smartly?

- *That my preconceptions about Australia have changed, I thought it is so special in terms of protecting nature, but it is just as the rest of the world*

The motivation to make a research in Australia was rooted in some exotic definition of the "field". As Gupta and Ferguson [59] argue about the locations of doing anthropological research, the degree of otherness from an archetypical home and the great geographical distance between Europe and Australia made me think that reality is different in this country. Moreover, due to the unknown, rich and untouched wilderness that still exists in Australia I thought that nature is much more protected. However, I came to realize that this place is just like the rest of the world, simply implying that basic patterns of human behavior are universal.

- *That my informants were all extremely well-informed*

All the people that I came across and discussed about the Traveston dam proposal left me with a great impression, because they were aware of the environmental risks as well as the underlying politics around this issue. Australians have a particular lifestyle. They do not want to be patronized as well as feel isolated. Due to the vastness of the country, people have learnt how to self-organize and become updated about all the issues that concern their lifestyle. From the early Country Women Associations until the development of the landcare groups one can see that networking and community organization plays an important role in the Australian lifestyle.

- *That I was interested in process but people were focused on the dam impacts of the dam proposal*

The Traveston dam proposal has caused an immense frustration in the community of the Mary Valley especially in Kandanga. The purchase of some 80% of the land within the proposed dam footprint from the QWI has been a great challenge to the people of this area. The community networks (family and friendships) as well as the business activities have been disintegrated and the influx of temporary residents to the currently rented properties that used to be owned by the people who lived in the

[59] Gupta A. and J Ferguson, *Anthropological Locations: Boundaries and Grounds of a Field Science.* **(**Berkeley, London: University of California Press, 1997).

Valley for generations have changed the dynamics of the community life. Those who have remained are fighting to adapt in a rearranged community and institutional structure as well as struggle with the uncertainty of whether this dam is going to be built. This has caused people to be extremely emotional and sometimes refusing to talk about the issue with somebody from "outside".

The social, human, environmental and economic impacts of the dam proposal have been admittedly large and usually dominated my discussions with the informants. The disappointment which stemmed from the maltreatment of people and nature as well as the irrationality of this proposed project was usually coloring the interviews with an inherent stress.

- *That the catchment is a social construction*

The view of the cathcment being a social construction is receiving a great appreciation within the context of IWRM and has great implications for researchers, policy makers and water managers [3]. In shifting to an understanding of catchments as social systems or social entities rather than only biophysical, we are drawing on a well established intellectual tradition [33, 3] and in particular in understandings which relate to the biological basis of social constructivism [60].

The etic reflections as well as the dilemmas that have exposed some of the people's worldviews around the Traveston dam proposal have led me to conclude that the complexity of these worldviews do not emerge merely from a highly contested issue, such as the dam proposal. The ways of perceiving this proposal, as being a part of the Mary River issues, have their origins in a construction of the river as a whole system-that is a holistic construction. This complexity is reshaped from the sources to the mouth of the river-in space, as well as through the local or global challenges that the catchment has undergone in time, such as the changes of agricultural practices and land uses (lower demand for dairy products and pineapples from the UK after the formation of the European Union, general decline of farming activities), of institutions (landcare groups are formed along the catchment in the early 90's) and of

[60] Maturana, H. and F. Varela. *The tree of knowledge, the biological roots of human understanding*. (Shambala Publications, Boston, Ma, 1992).

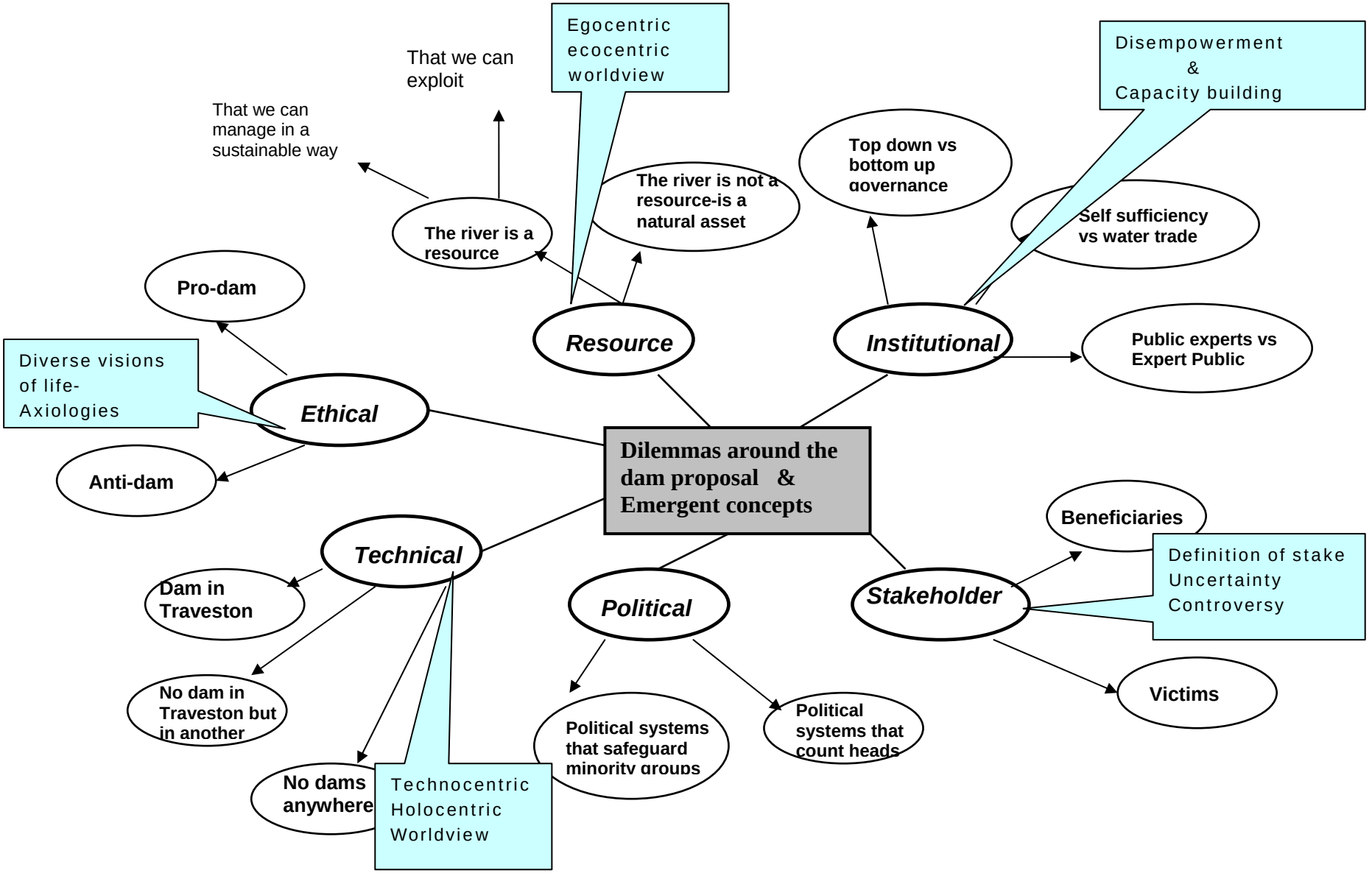
government policies (current regional planning including the Mary and the Burnett rivers in one administrative catchment).

6.5 Where do I stand?

Entering a community which has experienced so many changes because of the dam proposal has been a great challenge for me. From the beginning of my stay in Kandanga, I was able to sense the dynamics of the life in a town which has been fading. Every day activities have unfolded in front my observing eyes and the people's struggle to keep going-each one with his one lifestyle and worldview.
One of the town's weekly visitors is the old steam train which takes tourists from Gympie to Imbil, for a tourist drive through the Mary Valley. When the train stops to Kandanga the silent train station seems to revive for a few hours. The volunteers of the "Friends of Kandanga" wait the tourists with their stalls prepared ready to sell souvenirs of Kandanga and other things. This is an initiative, as many of those organised by the already existing for many years "Friends of Kandanga", such as the sport activities and the trips. These activities keep the town alive, as one voice of the community saying to all those people coming "We are still here". But the same "train" day the information centre of the STMRCG, which has been smartly situated close to the train station, becomes full of tourists that wonder what all these yellow signs mean about stopping the dam. The volunteers of the STMRG information centre passionately explain to the visitors all about the dam proposal. The visitors seem frustrated about the unsuitability of this proposal and sign letters which will be later sent to the politicians. Most of the tourists and particularly those coming from Brisbane accept their ignorance and state their disapproval.

One of these "train" days I was interviewing some informants in the information centre. When the train was leaving, I felt that I wanted to grab a sign and be part of this presence and action against the dam proposal. When all this was happening around, I felt useless and sometimes lazy or insulting the fighters when just sitting and observing or asking questions. I felt detached. However, I have chosen to stand as such throughout the research process, because I believe that if I immersed my self into an activist's behaviour I would be rather disorientating myself as well as the people

around me about what I am doing. I avoided focusing on the anti-dam actions because I wanted to sense what is happening through the whole system around this proposal. Beside my personal values about the dam proposal, I have tried to remain as both an engaged researcher and a disengaged analyst. This position has been respected. I have learnt though that the boundaries of a researcher's role are continuously negotiated and that the researcher's values should not interfere with the interpretation of the people's realities.


Dilemmas around the dam proposal & Emergent concepts
Resource
Institutional
Ethical
Technical
Political
Stakeholder
The river is a resource
That we can exploit
That we can manage in a sustainable way
Egocentric ecocentric worldview
The river is not a resource-is a natural asset
Top down vs bottom up governance
Disempowerment & Capacity building
Self sufficiency vs water trade
Public experts vs Expert Public
Pro-dam
Diverse visions of life-Axiologies
Anti-dam
Dam in Traveston
No dam in Traveston but in another
No dams anywhere
Technocentric Holocentric Worldview
Political systems that safeguard minority groups
Political systems that count heads
Beneficiaries
Definition of stake Uncertainty Controversy
Victims

Annex 2. Matrix

Summary of what informants said

Stake	Long-term resident in the valley, have farm or house that will be inundated or not. If affected I will sell my land or I will not sell my land or I have sold it. Resident of Gympie or Crystal Waters or Maleny-will not be affected but concerned due to environmental impacts.
Feelings	Shocked no prior consultation, frustrated as there are better ideas, angry Government not listening, disappointed by lack of research-unsuitable site, claustrophobic because of growth manure, outraged because I know it is political bargaining, hard to keep calm with something so wrong, depressed with what we are doing to our rivers, afraid every day uncertainty because the decision to approve it or not is delayed, mixed feelings-feel bad for the dislocated people but have to see the opportunities.
Political implication of proposal	Pre election promise, political bargaining the chosen location is not a Labor constituency and that suited them, they do not accept it is wrong because they will lose face, trying to convince people that water demands are increasing and we need infrastructure, but the truth is they are planning for future growth. An amalgamation for "job for the boys" and merging councils, then more control in town planning. We have the first female premier she wants to show she is strong, a mega-project is attractive for votes and investors.
Vision	I Want: to see the valley the way it was, with the electricians and carpenters, they must return here with their families, with a variety of activities-viable. To sell and go back to my normal life. To retire in this land. To be self-sufficient, grow veggies. The farmers to get this land back. To have small decentralized self sufficient communities and reduce living standards. To see Government adopting sustainable planning and legislation. To

	see agricultural land be used efficiently, organic farming, to reassess the capabilities of the land in the Valley. To revegatate river banks. To see the Mary River world-heritage listed. To see Government acknowledging the river as an integrated catchment with people aware of the connective ness. To have my lifestyle back. To see the Valley prosper economically and a redefined structure with old and new residents. To see humans treat creatures with respect, to let rivers flow. To see adapting in the new circumstances and supplement business. In case the dam is not built to see people in the Valley committing to their land, rather than the Government planting trees or subdividing the land.
Best alternatives	No dams anywhere, it is an old-fashioned technology. The dam is a good idea but wrong spot, raising Borumba dam or make another wall further down the Borumba and store water from a larger catchment-then no dislocation and no loss of fertile land. I don't know, the experts did the study they know better. Rainwater tanks is the best ideas, we have so much rainfall in SEQ and Brisbane. More recycling! Europe is doing the same. Desalination is expensive-another industrial monstrosity. Pump water from the river or weirs and put it to the empty dams. Raise Borumba dam only by 25m and only for the catchment needs- No interbasin water transfer-transfer people not water. Desalination using wind power. Put more weirs on the Mary river.
Lessons learnt from interaction With Government	They are liars. Statistics make lies beautiful and deceive people to agree. No more trust. I can accept that politicians are dishonest but cannot understand why public servants carry on the decisions of their masters and intimidate people. Senate Inquiry sought more truth than the Government consultants. Government is dogmatic and does not listen to local

	stakeholders, only to engineers. There is no continuity in government structure and department managers have no scientific background. Local knowledge was insulted, people found that Government would not listen to sound arguments. They did not have a good plan-this created uncertainty. They are prepared to do irreversible damage for short-term gains. Secrecy of documents, dishonest when announcing the proposal. I have learnt more about how the world works now.
With people in the Mary River Valley community	Some invested and became better-off when sold. New global economics and lifestyle make people believe water comes from the tap. Brisbane people think so-they are ignorant. Majority of the people in the Valley are intelligent and good-hearted even if they don't seem so, yet badly treated. People are resilient; they were able to adjust after this proposal. We now take the initiative to talk about the dam proposal, we don't expect them to come. There was uncertainty and ignorance in the community and people (young especially) sold, felt like they were leavening a sinking ship. Hard to keep up the fight. People in the Valley felt betrayed and people in Brisbane free of the anxiety of running out of water. People sold and gone nobody cares. Some people think there will be work after thee construction, but these future places will be very few compared to the loss of businesses and farmers! People in the Valley have a strong association with the land, either because they have been living here for generations or because they are farmers. People in Brisbane don't really care about the lungfish but seem to care for Fraser island, in case the dam is built, as this is a tourist attraction for Brisbane people. People have incredible dedication and ability to continue the fight, to get the community attention and Brisbane people+ Government together. Because the community was so diverse (young people from Brisbane, short+long-term residents, various lifestyles) it was easy to disintegrate. Would not be the same if proposal happened 20yrs ago, when

	community was homogenous with lots of pure country people. I saw people wish to move forward to change, (either in different business targets or lifestyle-get the money and want go to live elsewhere) and try to pull together to achieve that (Mary Valley Inc)
Within the Save The Mary River Coordinating Group (STMRCG)	Building information sharing within the group. Have to be patient. People are different. A need like stopping a dam can overcome social barriers. People from different fields (farmers-environmentalist) and political views had to sit on the same table. Obliged to put differences aside. Amazed how people who were not going to be affected got together with us. I would do the same e.g. to the fires in Victoria, We are all one! I saw the changes and the devastation and I needed to stand up and do something-to help! At first I thought the STMRCC was for the people in the Valley and I was working from the edges, but when I saw people were discouraged fighting and selling out I was motivated to join the committee. Interaction with both STMRCC and MRCCC. Few key people with basic knowledge (skills from having done revegetation, quality monitoring) to start with, then others built it. -hard to bring people together toward a goal -A great depth of skills and abilities was used to this reason -People's power can make a difference. The STMRCC made Valley think differently, inform about the river issues, people are aware of misleading policies and alternatives. Both committees have led to people thinking in a regional level, not individuals. Communication has increased. Depth of a strong network among towns, share the 'know how'. Aware and capable of what one can achieve.
Changes after dam proposal	Residents of Kandanga have sold properties, transfer from stable to itinerate population-the temporary renters are not involved. Community fraction. The system of trade has been upset. Businesses (like real estate) in Gympie and Imbil have been

impacted. New residents coming from shed and caravans rented the leased houses and came in the community (drug-addicted, alcoholic). I saw kids loosing their friends and crime and vandalism to increase at schools. True effects will be obvious later.

-If proposal stays stagnant and dam does not go ahead in the short-term, then this will make people suffer.

-If it goes ahead then the new influx of people will complement to creating a new culture. Loss of trust, but Great advance in increasing the water debate (use, alternatives, tank industry). Division within the community that manifests few people pro-dam. Raised environmental awareness, tribal feeling-unity with individuals. Dam issue has filled our minds.

Community groups have emerged (STMRCG, GMA, MVI).