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Tooku awa koiora me oona pikonga he kura tangihia o te maataamuri

The river of life, each curve more beautiful than the last

A Sustainability Assessment of the Waikato River Authority

A Dissertation submitted in partial fulfilment of the requirements for the Degree of Master Of Applied Science (Environmental Management) at Lincoln University by Kristy Maree Jones

Lincoln University 2015
Abstract

Abstract of a Dissertation submitted in partial fulfilment of the requirements for the Degree of Master of Applied Science (Environmental Management)

A Sustainability Assessment of the Waikato River

By Kristy Maree Jones

The Waikato River is arguably one of New Zealand’s most important water bodies. It has a rich cultural heritage, and embodies a number of values for all parts of society. The river has been exposed to decades of contamination, exploitation, and degradation, and its current state now paints a sorry picture. The ecological integrity has been eroded, and relationships and values held with the river have been diminished. The creation of the Waikato River Authority in 2009 brought a new era of co-management to the table regarding the management of natural resources. The Waikato River Authority implemented a vision and strategy that would guide the restoration and protection of the health and wellbeing of the river and safeguard it for future generations. This research uses sustainability assessment to assess the potential of the Waikato River Authority to reach its vision, based on the objectives, strategy and actions implemented.

Keywords: Waikato River, Waikato River Authority, Sustainability, Sustainability Assessment, Co-management, Vision and Strategy, Environmental Degradation, Values
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Chapter 1- Introduction

Tooku awa koiora me oona pikonga he kura tangihia o te maataamuri- the river of life, each curve more beautiful than the last (Waikato River Authority, n.d.) (p.1). The mighty Waikato River, the longest river of New Zealand, is arguably one of the country’s most important. The river embodies not only a deep history, but also has a rich cultural heritage. It plays a key role in the economic stability of the country, is a valuable resource that can be utilised by society in numerous ways and has a number of values associated with it. The river is now, unfortunately, in a degraded state with many implications for the environment and the society that holds the river close to their heart. Having grown up alongside the Waikato River I have personally experienced these effects and it is frightening to imagine what the river’s future contains if action does not occur. Degradation and exploitation have eroded the ecological integrity of the river, diminished its relationship with local iwi, and reduced the opportunity for future generations to utilise it in a safe manner that meets their needs. In response, the Waikato River Authority (WRA) was established in 2009. The failure of previous management styles has led to a new era of co-governance between the Crown and local iwi. It is expected that through the implementation of a collaboratively created vision and strategy, the restoration and protection of the health and wellbeing of the Waikato River will be achieved (Waikato River Authority, n.d.). Given the vision and the expectations, this research undertakes a sustainability assessment of the WRA’s strategy and objectives that have been put in place to achieve a vision for a healthy Waikato River.
A sustainability assessment has been adopted as the model of evaluation for the following reasons. First, sustainability is an increasingly important topic and in order for the water resources of the Waikato River to be utilised by future generations, actions need to be put in place now in order to ensure a sustainable state in the future. Second, while sustainability is a subjective concept, it will be shown that the vision set by the WRA incorporates sustainability principles. And thirdly, sustainability is the key feature of New Zealand’s most significant planning legislation- the Resource Management Act 1991. For these reasons, sustainability criteria will be used to assess the potential of the actions of the WRA to achieve the vision it has set for the future of the River.

This research will help determine if this new co-governance approach, and the implementation of the WRA will be the change needed to improve the quality of the Waikato River to enable it to become a viable entity again. Albert Einstein, as cited by Young (2012, p. 1) aptly sums up this situation by explaining, “problems cannot be solved with the same level of awareness that created them”. Young discusses how we now find ourselves on a planet depleted of many of its life supporting resources. He argues that in order to find sustainable solutions we must examine paths that have previously been underused, and rethink how we develop and build future pathways. (Young, 2012). Young’s explanation of the need to find new solutions is reflected in the new approach to governance of the Waikato River Authority. Specifically, the integrated and holistic characteristics of co-governance, which will ensure the adequate representation of all sectors of society in decision-making processes that are open and democratic.
1.2 Research Aims and Objectives

The aim of this research is to conduct a sustainability assessment of the Waikato River Authority’s strategy to assess the potential of its vision to be achieved.

The research question that has steered this research:

- Does the Waikato River Authority have the potential to achieve its vision set for the Waikato River?

This research has been guided by a number of objectives:

- Develop an analytical framework that can be applied to the strategy and actions of the Waikato River Authority
- Conduct an analysis of key documents against sustainability criteria and determine whether the Waikato River Authority strategy will enable it to achieve its vision
- Make recommendations to assist the Waikato River Authority in improving its drive towards a sustainable future, and how it can possibly meet more of the criteria

1.3 Outline of Dissertation

This dissertation has six chapters. Chapter 2 sets out the background for the assessment, in particular the values of the river, the current state of the river’s catchment, along with a brief look at the current key pieces of legislation and how sustainability fits into the picture. The legislation sets the overarching statutory framework, which is important to examine in order to identify what is required in the management of natural and physical resources in New Zealand. The research will then move onto a review of the vision and strategy of the Waikato River Authority, its co-governance structure and the Clean Up Trust established to administer a pool of money for the Authority’s restorative work.
Chapter 3 sets out the conceptual framework for the research, which is a synthesis of research and commentary on the concept of sustainability, its history and critique. Along with a review of the process of sustainability assessment.

Chapter 4 describes the methodology for this research, which adopts an evaluation approach by conducting a sustainability assessment of the strategy and actions implemented by the Waikato River Authority.

Chapter 5 discusses the results of the sustainability assessment, broken down into the eight criteria that will be discussed in due course.

Chapter 6 discusses the results and deems whether the vision can be achieved. The chapter includes recommendations for the Waikato River Authority, and any implications.
Chapter 2 – Background

In order to comprehend the significance of the sustainability assessment of the Waikato River Authority, the background and context of the river, catchment and the wider legislative environment must first be understood.

2.1 The River

The Waikato River is New Zealand’s longest river. Stretching 425 km from its headwaters of Lake Taupo, it drains into the Tasman Sea at Port Waikato to the North (Te Aho, 2010). The river’s catchment spans 14,260 sq. km and covers 12 per cent of New Zealand’s North Island (Waikato Regional Council, n.d.-a). The Waikato River is arguably one of New Zealand’s most important waterways, with its contribution to the country’s social, cultural, environmental and economic wellbeing. Section 9 of the Waikato-Tainui Raupatu Claims (Waikato River) Settlement Act recognises this contribution as a matter of national importance.

2.2 Values of the Waikato River

The following values are held for the Waikato River.

2.2.1 Maori

For Maori, the personification of the natural world is a crucial feature of traditional Maori culture. In the eyes of Maori, river’s and water bodies are not simply a resource. Instead, they are considered an ancestor and key component to the way of life of local iwi (Te Aho, 2010). The Waikato River has been utilised for the past 700-800 years, and has provided physical and spiritual nourishment for the local iwi inhabiting the catchment. The Waikato-Tainui tribe describes the river and considers it as a tupuna (ancestor) that has mana (spiritual authority). It in turn represents the
mauri (life-force) of the Waikato-Tainui tribe (Waikato Tainui Raupatu Claims Settlement Act, 2010, s.8). It is also considered a taonga and the mauri of the five other tribes of the river (Waikato Regional Council, n.d.-a). The characteristics of the river and its iwi were captured in a well-known saying, which recognises the power and prestige given to the Waikato tribes (Te Aho, 2010; Waikato River Authority, n.d.):

“Waikato taniwharau!

He piko he taniwha, he piko he taniwha

Waikato of a Hundred Taniwha!

At every bend, a chief, at every bend a chief” (p. 286)

Since settlement these tribes have developed tikanga (laws and practices), which have reflected their bond with the river. These practices related to all aspects of life, including the blessing of children, cleansing and healing and the gathering of food and resources provided by the river. A key part of these practices was recognised that if people care for the river, then the river will in turn continue to sustain them (Te Aho, 2010).

Along with playing a spiritual role in the lives of local Maori, the Waikato River was crucial for every day life of tribes. In the past, plentiful amounts of eel, inanga (whitebait), koura (freshwater crayfish), kanae (mullet), waterfowl and vegetables were harvested from the river and associated wetlands (Waikato Regional Council, n.d.-a).

Due to the degradation of the river, these understandings and values of the river and its ecosystems have been compromised and neglected over the years which have had a destructive effect on the culture and heritage of iwi of the Waikato River (Te Aho, 2010).
2.2.2 Hydro-electricity Generation

The Waikato River is a source of renewable energy. Eight hydro-electrical power stations are found along the length of the river. Located at Karapiro, Arapuni, Waipapa, Whakamaru, Atiamuri, Ohakuri, Aratiatia and Maraetai (Mighty River Power, n.d). Mighty River Power provides electricity to 1-in-5 New Zealand households and businesses, with 61 per cent of this electricity generated by the power stations along the Waikato River (Mighty River Power, n.d). The eight power stations generate on average 4,200 gigawatt hours for New Zealand electricity requirements (NIWA, 2010). This makes up 13 per cent of the national electricity supply, and up to 25 per cent of daily peak supply. The hydro-electric system of the Waikato River is seen as a keystone asset in the New Zealand economy because it provides ancillary services to the New Zealand power supply – including frequency control, power reserves, voltage support and black start capacity (NIWA, 2010).

Hydro-electric dams do, however, have a number of negative effects, and large environmental impacts on the river’s in which they are situated (Koehler, 2008). In the case of the Waikato River, these dams have positive aspects along with a number of negatives. The dams, and the resulting lakes have drowned a number of sites of cultural importance such as rapids, geothermal features, burial caves and pa sites. The dams affect the natural migration passage of a number of fish species of the river such as inanga (whitebait), tuna, galaxiids and lamprey. It is expected the dams have limited this movement by approximately 25 km (NIWA, 2010). Water is now sitting for longer in the dams, and as a result increased algal growth is being witnessed. This decrease in the downstream flow regime has increased the suspended algal biomass four-fold, and had a direct effect by reducing water clarity (NIWA, 2010). Sediment
that would otherwise flow downstream and nourish the beds and provide essential nutrients are now being trapped in the dams—approximately 280,000 tonnes per year. The Upper Waikato River contains high levels of arsenic and mercury concentrations resulting from the naturally occurring geothermal inputs of the region. This is additionally elevated due to the geothermal power station discharges into the river. Importantly, 8% of the arsenic input to the river is also being trapped (approximately 204 tonnes per year). Resource consent conditions require Mighty River Power to set minimum and maximum levels at the Taupoo Gates and minimum flows at the Karapiro Outlet. However, there are no restrictions on rates at which the flows are varied to generate hydro-electric power to meet fluctuations in power demand. As a result these changing flow regimes are increasing stream bank and bed erosion, while also reducing macrophyte abundance between Karapiro and Ngaaruawaahia (which in turn effects invertebrates, habitats and the food supply) (NIWA, 2010).

2.2.3 Source of Freshwater

Freshwater is one of the Earth’s most precious resources – there is no alternative. It is crucial for human health and our basic everyday requirements including hydration, hygiene, sanitation and food supply. It also supports biodiversity and ecosystem functions that all life on Earth relies on. Of course, water also underpins economies (Koehler, 2008).

The importance of the Waikato River as a source of freshwater is reflected in the competing uses for consumption, irrigation, ecosystem health and power generation. The greatest consumptive take is for supplementary drinking water for Auckland (up to 1.7 m3 per second), providing 10% of the city’s water needs. Thirty other towns in the catchment also abstract water, including Hamilton (NIWA, 2010).
2.2.4 Environmental / Ecological

River systems have the potential to be rich environments that support a number of crucial ecosystem services. This includes biodiversity of many aquatic and non-aquatic species, natural flood management processes, the transportation of essential sediments to the ocean, species habitat, diffuse pollution control while also playing a key role in the broader social and cultural environment of the region (Gilvear, Spray, & Casas-Mulet, 2013). Multiple studies have additionally shown that good water quality is considered of high importance for communities within the Waikato region (Barns, Henry, & Reed, 2013).

2.2.5 Recreation

The Waikato River is highly valued in terms of its recreational potential. Its sheer length means many communities can easily access and utilise it in terms of swimming, fishing, and boating activities (NIWA, 2010), while also associating it as an important part of activities occurring around and alongside the Waikato River (Barns et al., 2013). Water quality is an important factor for recreational value. Water must be of a high enough quality to ensure the safety of users, while additionally adding to their enjoyment.

2.3 Current State

2.3.1 Environmental / Ecological

Iwi and communities connected to the Waikato River have been witnessing a dramatic decline in biodiversity in the catchment over the last two decades. The tuna (eel) fishery has declined by 75%, the whitebait fishery has also experienced a similar decline. In 2000, the total whitebait catch was estimated to be three tonnes per year. During the 1980’s, whitebait catches were yielding a total of 10 tonnes per year, and
between 1931 and 1950 yearly catches were averaging 46 tonnes. The piiharau (lamprey) fishery is now non-existent with the only remnant of the population found in the Waipa River. Kooura (freshwater crayfish) and kaaeo (freshwater mussels) are no longer common in the lower Waikato River and its many shallow lakes (NIWA, 2010). These species were all considered important for iwi of the River, and were a traditional food source. The decline of biodiversity is cause for concern and is reflected in the loss of habitat, barriers to migration, competition, loss of connectivity, predation, poor water quality and over harvesting (NIWA, 2010).

The decline of species such as koura and kaaeo is also of concern as these are considered keystone species in the Waikato River Catchment. A keystone species is defined as a species whose effect is large within an ecosystem, and the removal of it will have numerous flow on effects within the ecosystem and the potential of a trophic cascade (Payton, Fenner, & Lee, 2002). Kooura play a dominant role in the ecosystem as they break down and recycle detritus in the water body and in addition are key predators, remove alga, and facilitate the growth of diatoms and in turn the invertebrates that rely on these diatoms (Parkyn, Rabeni, & Collier, 1997). Kaaeo are filter feeders that clean the water and remove sediment from the water column. Unfortunately, kaaeo populations are now sparse and require substantial research in order to identify existing populations and to re-establish these important species (NIWA, 2010).

The Waikato River currently supports 19 species of native fish, and 13 aquatic species. Many of these indigenous species have been historically important for iwi, including piiharau, poorohe (smelt), aua (yellow eyed mullet), trout and paataki
(flounder). However population trends are currently showing a decline in abundance. While little research has been undertaken on this topic, loss of habitat combined with reduced water quality will have had a significant impact on these populations (NIWA, 2010).

The expansion of development and agriculture has led to the decline and loss of most of the Waikato’s wetlands. This has had a significant effect on plant biodiversity of the region. In addition, iwi have also noted that harakeke (flax), kuta (rush) and other traditional plants are less abundant (NIWA, 2010).

2.3.2 Maori relationship with river

Human activities in the catchment over the last two decades in particular have compromised the integrity of the river’s many ecosystems and communities. Not only is the river in such a degraded state it can no longer support healthy ecosystems, it has also compromised the ability of iwi to exercise mana whakahaere and undergo their tikanga and kawa. Maori have a close spiritual bond with water bodies, and the five iwi of the Waikato River consider it an ancestor and a living being. With this spiritual connection in mind, anything that damages or harms the river will in turn harm their spiritual connection. This involves everything ranging from contaminants and loss of species to restricted access and the degradation of the water quality (NIWA, 2010). Iwi relationship with the river and their livelihood has been further compromised with the ability of iwi to exercise kaitakitanga (guardianship), tikanga (customs) and kawa (ceremonial rituals) being reduced. This is a result of issues surrounding the loss of significant cultural and historic sites that have been lost or degraded, the loss of access, loss of species and habitat destruction (NIWA, 2010).
Access to the river is crucial for the Maori community to exercise their cultural traditions. The river iwi have experienced a loss of this access to the river resource over the last two decades, through the privatisation of the riverbank and land within the catchment, and the establishment of the multiple hydro-electrical dams.

2.3.3 Freshwater

The Waikato River is no longer a source of fresh, clean, high quality water that can be used for drinking purposes. While it does provide a water source for Auckland and Hamilton and numerous smaller settlements, the water must first be treated to get it to drinking water standard. The many uses of the catchment are causes of concern for contamination such as high nitrate levels, faecal contamination, *E. coli*, and arsenic levels (NIWA, 2010). The contamination of the water has also had a flow-on effect to food gathering. Not only has the poor water quality reduced the ecological integrity of the river; it has also reduced the number of species now present. There is also concern that levels of mercury and arsenic (while naturally occurring in the geothermal region, concentrations are increased through sediment holding in the dams), bacterial and microbial contamination could pose a risk during human consumption. However, research is still limited as to the degree of hazard (NIWA, 2010).

2.3.4 Role in the economy / Demand for water

The Waikato River catchment provides for a highly productive agricultural sector, plantation forestry and other processing industries. Combined with the needs of the urban populations of the catchment, the receiving environment has been severely degraded and its biodiversity and ecosystem services compromised in the process of playing a pivotal role in supporting the regional economic activity. For example, in 2007, the region had a gross domestic product (GDP) of $15.6 billion (9% of the countries total GDP). The dairy industry is the largest contributor, by adding $1.4
billion to the Waikato Regional Economy annually (NIWA, 2010). The river is a receiver of diffuse pollution from these agricultural activities, in addition water is abstracted for irrigation, crop and stock needs.

As development and industry continue to grow, so is the demand for water takes from the river and associated groundwater reserves. In May 2014, 87% of the allocable flow at the river mouth had already been allocated (Waikato Regional Council, n.d.-b). The Waikato River is a supplementary water supply for Auckland City Council, providing 10% of the cities water requirements. As the city continues to experience rapid growth this demand on water is set to increase. Irrigation water is another large use of the river resource; in 2008 consented rates for pastoral land in the region were 2.4 cubic metres per second. By 2010 there had been a 202% increase in demand for irrigation water (NIWA, 2010). Consumption, irrigation, power generation and ecosystem services now compete for water supplies.

Reflected in the current state of the Waikato River, previous management styles have proven ineffective in sustaining a healthy and viable river system. The degradation and resulting state of the river has been the driving force behind the creation of the WRA set up to restore and protect the river’s health and wellbeing.

2.4 Waikato River Authority

The Waikato River Authority is a statutory body established under the Waikato-Tainui Raupatu Claims (Waikato River) Settlement Act 2010. The purpose of the Authority set out under Settlement Act 2010 is to:
- Set the primary direction through the vision and strategy to achieve the restoration and protection of the health and well-being of the Waikato River for future generations;
- Promote an integrated, holistic, and co-ordinated approach to the implementation of the vision and strategy and the management of the Waikato River;
- Fund rehabilitation initiatives for the Waikato River in its role as trustee for the Waikato River Clean-up Trust (Waikato-Tainui Raupatu Claims (Waikato River) Settlement Act 2010, s 22)

The Authority is an independent co-governance organisation between the Crown and Iwi, with the board of ten members consisting of a 50:50 split of representatives. The Authority is tasked with the implementation of the vision and strategy that applies to 11,000 square kilometres of the Waikato Catchment (Figure 1), and the allocation of $220 million over the next 30 years (Waikato River Authority, n.d.).
Figure 1- Map of the Waikato River catchment

Source: (Waikato River Authority, n.d.)
2.5 Co-Governance Structure

The Settlement Act provides for co-governance by establishing the Waikato River Authority, and entrenching the 50:50 board membership of elected iwi and Crown members. Together, both parties are responsible for the overall vision and strategy of the Authority and how it will be implemented (Te Aho, 2010).

Along with the establishment of the Waikato River Authority, the Settlement Act provides for co-management of the Waikato River in a number of other ways. Under the Settlement Act, an integrated river management plan has been prepared by a number of stakeholders, including the Waikato-Tainui tribe, local authorities, agencies and other departments in a coordinated and cooperative manner (NIWA, 2010). When resource consent hearings are held for issues that concern the taking, use, damming, diversion and discharges to the Waikato River, the Authority appoints commissioners to the panel who sit alongside Council elected representatives (Waikato-Tainui Raupatu Claims Settlement Act 2010, s 28). Joint management agreements have also be made between relevant local authorities and Waikato-Tainui concerning matters of the river and the wider catchment (NIWA, 2010; Te Aho, 2010). Section 36B of the Resource Management Act 1991 states that joint management agreements allow local authorities, iwi and other groups to work together and enter into an agreement regarding natural and physical resources and to help develop and encourage collaborative schemes (Resource Management Act 1991).

Co-management schemes have been touted as important governance arrangements in the management of environmental issues. Natural resources are never simply a
straightforward system in their own right. Instead, they consist of a complex web of connections and intricacies, combined with issues of scale and lag effects. This complexity makes it extremely difficult for individual agencies to govern and manage effectively (Berkes, 2009). As discussed by Berkes (2009), the core idea behind co-management is that those who are affected by decisions should have a say in how those decisions are made. Co-management allows the collaboration of parties to bring together a common goal by integrating a number of different knowledge types— in particular western science based views and indigenous knowledge (Berkes, 2009).

According to Watson (2013), the key to improving co-management results is to create a regime that is more adaptive and focuses on better communication among all parties, along with mutual learning.

2.6 Vision and Strategy

In accordance with the Settlement Act, the WRA was tasked with developing a vision and a number of objectives and strategies to restore and protect the health and wellbeing of the Waikato River (Figure 2). Members of the community were encouraged to participate and be involved in its development, and a number of public consultation sessions were held to facilitate this input. Both the vision and strategy integrate the objectives important to the Waikato-Tainui tribe, and the objectives that reflect the interests of other Waikato River iwi and all New Zealanders (Waikato River Authority, 2014).

The vision that guides the Authority is:

“For a future where a healthy Waikato River sustains abundant life and prosperous communities who, in turn are all responsible for restoring and
It can be seen that this vision embodies the notion of sustainability in that it incorporates aspects of resource and ecosystem restoration and protection, community wellbeing as well as intra- and intergenerational equity.

In order to achieve the vision, the following objectives have been established:

(a) The restoration and protection of the health and wellbeing of the Waikato River
(b) The restoration and protection of the relationships of Waikato-Tainui with the Waikato River, including their economic, social, cultural, and spiritual relationships
(c) The restoration and protection of the relationships of Waikato River iwi according to their tikanga and kawa with the Waikato River, including their economic, social, cultural, and spiritual relationships
(d) The restoration and protection of the relationships of the Waikato Region’s communities with the Waikato River, including their economic, social, cultural, and spiritual relationships
(e) The integrated, holistic, and co-ordinated approach to management of the natural, physical, cultural, and historic resources of the Waikato River
(f) The adoption of a precautionary approach towards decisions that may result in significant adverse effects on the Waikato River and, in particular, those effects that threaten serious or irreversible damage to the Waikato River
(g) The recognition and avoidance of adverse cumulative effects, and potential cumulative effects, of activities undertaken both on the Waikato River and within the catchment on the health and wellbeing of the Waikato River

(h) The recognition that the Waikato River is degraded and should not be required to absorb further degradation as a result of human activities

(i) The protection and enhancement of significant sites, fisheries, flora, and fauna

(j) The recognition that the strategic importance of the Waikato River to New Zealand’s social, cultural, environmental, and economic wellbeing requires the restoration and protection of the health and wellbeing of the Waikato River

(k) The restoration of water quality within the Waikato River so that it is safe for people to swim in and take food from over its entire length

(l) The promotion of improved access to the Waikato River to better enable sporting, recreational, and cultural opportunities:

(m) The application to the above of both maatauranga Maaori and the latest available scientific methods

- (Waikato River Authority, n.d.) (p. 6)

And in order to achieve the objectives, the following strategies are to be implemented:

(a) Ensure that the highest level of recognition is given to the restoration and protection of the Waikato River:
(b) Establish what the current health status of the Waikato River is by utilising maatauranga Maaori and the latest available scientific methods:

(c) Develop targets for improving the health and wellbeing of the Waikato River by utilising maatauranga Maaori and the latest available scientific methods:

(d) Develop and implement a programme of action to achieve the targets for improving the health and wellbeing of the Waikato River:

(e) Develop and share local, national, and international expertise, including indigenous expertise, on river’s and activities within their catchments that may be applied to the restoration and protection of the health and wellbeing of the Waikato River:

(f) Recognise and protect waahi tapu and sites of significance to Waikato-Tainui and other Waikato River iwi (where they do decide) to promote their cultural, spiritual, and historic relationship with the Waikato River:

(g) Recognise and protect appropriate sites associated with the Waikato River that are of significance to the Waikato regional community:

(h) Actively promote and foster public knowledge and understanding of the health and wellbeing of the Waikato River among all sectors of the Waikato regional community:

(i) Encourage and foster a “whole of river” approach to the restoration and protection of the Waikato River, including the development, recognition, and promotion of best practice methods for restoring and protecting the health and wellbeing of the Waikato River:
(j) Establish new, and enhance existing, relationships between Waikato-Tainui, other Waikato River iwi (where they so decide), and stakeholders with an interest in advancing, restoring, and protecting the health and wellbeing of the Waikato River:

(k) Ensure that cumulative adverse effects on the Waikato River of activities are appropriately managed in statutory planning documents at the time of their review:

(l) Ensure appropriate public access to the Waikato River while protecting and enhancing the health and wellbeing of the Waikato River.

The principles of sustainability are expressed in the strategy and objectives through the incorporation of key decision-making criteria as depicted in Appendix 1. The purpose of this research is to assess the potential of these sustainability intentions to achieve their aims based on the actions put in place, and the projects funded that will bring about this change.

![Flow chart showing the relationship of key components of the WRA restoration programme](image-url)
2.7 Waikato River Clean-Up Trust

A key mechanism to translate the strategy into the vision in alignment with the objectives is the Waikato River Clean-Up Trust. The WRA is the sole trustee of the Waikato River Clean-up Trust. The Trust is responsible for administering and distributing the $220 million worth of funding to work towards the restoration of the health and wellbeing of the Waikato River to ensure its protection for the current and future generations. The fund is contestable and in accordance with criteria set every year, the Authority determines what projects will receive funding (Waikato River Authority, 2014). When allocating money to projects, the Authority must pay adequate regard to the vision and strategy document and the Waikato River Scoping Study. The Scoping Study, led by the National Institute of Water and Atmospheric Research (NIWA) was undertaken to identify the priority actions needed to restore and protect the Waikato River. The document provided the basis on which the WRA and Clean-Up Trust determined their restoration programme (NIWA, 2010). The comprehensive study is significant as it covers the entirety of the catchment and its key component is the integration of Western science combined with traditional maatauranga Maaori (NIWA, 2010).

As sole trustee, the Authority must prepare and publish a strategy document and criteria for the approval of funding. This document must identify funding priority areas. Priorities are set and assessed annually in order to ensure funding is being continuously aligned with the objectives of the WRA and the Trust (Waikato River Authority, 2014). The Waikato River Restoration Forum was formed to help identify these priorities. The forum was formed to identify ways in which industry,
government, and iwi can collaboratively work together for the benefit of the Waikato River and its catchment. It is made up of groups with significant interests in the catchment, and includes representatives from the Waikato River Authority, Waikato Regional Council, river iwi, Fonterra, Dairy NZ, Department of Conservation and Mighty River Power (Waikato River Authority, n.d.).

The annual Funding Strategy outlines the criteria and approach that the Authority believes will put the Trust in the best position to fairly and consistently award funds that will effectively aid in the restoration and protection of the Waikato River (Waikato River Authority, 2014). Funding decisions are based on applicants meeting the funding criteria, being for projects that are identified as priority areas, and the quality of the application. The Clean-up Trust has four guiding concepts - Protect, Restore, Health, and Wellbeing - at least one of which in regards to the Waikato River must be the focus of projects in order for it to be eligible for funding consideration. In order to gain funding, projects must meet at least one of six priority areas set by the Trust. The priority areas have been split into two broad focus areas revolving around project outcome and specific geographical location. Priority for funding has been identified for projects that support maatauranga Maaori, have a community outcome associated with the River and the catchment, or help the Trust monitor the effectiveness of funded projects. Geographically, funding has also be prioritised for projects proposed in areas above the Karapiro Dam to the Huka Falls, from the Karapiro Dam to the mouth of the Waikato River, and the Waipa River (Waikato River Authority, 2014). In 2014, a seventh priority was added to the list, putting an emphasis on projects that improved the water quality in the streams, wetlands, lakes and drains that flow into the Waikato River and its catchment.
The WRA has been established as a statutory body to guide the restoration and protection of the Waikato River. As highlighted, the Waikato River has many values associated with it. The severely degraded state of the river is eroding the river’s values and undermining its ecological, social and economic integrity. The Resource Management Act 1991 is New Zealand’s central piece of environmental legislation, concerned with the sustainable management of natural and physical resources. The following section highlights the role of the Resource Management Act 1991, and the legislation that established the Waikato River Authority.

2.7 Legislative Standing

2.7.1 Resource Management Act 1991

The Resource Management Act 1991 is New Zealand’s key piece of planning and environmental legislation. The RMA provides for sustainability to the extent that its purpose is the promotion of sustainable management of natural and physical resources (Resource Management Act 1991, s 5). Sustainable management, as defined by the RMA, means managing the use, development, and protection of natural and physical resources in a way that allows communities to provide for this social, economic and cultural well being while not compromising the ability to meet the needs of future generations (RMA, s 5).

The idea of sustainable management was inserted into the RMA as an attempt to establish sustainability principles at the centre of resource management in New Zealand (Sadler, Ward, & Frame, 2008). The adoption of these principles to guide resource management decisions was a significant and important step forward for New
Zealand environmental policy. It demonstrated a commitment at the highest level of public policy to the guidelines established in the Our Common Future report developed by the Brundtland Commission in 1987 (Furuseth & Cocklin, 1995). The RMA requires the implementation of statutory planning documents to be developed by local authorities.

2.7.2 Waikato Tainui Raupatu Claims Settlement Act 2010

In 1975 the Waitangi Tribunal was established. This allowed Maori to make a claim if they believed the Crown in breach of the Treaty of Waitangi had prejudicially affected them. The Waikato-Tainui tribe was one of the many to lodge claims. In the English version, the Treaty of Waitangi guarantees ‘the full exclusive and undisturbed possession of their Lands and Estates Forests Fisheries and other properties which they may collectively or individually possess so long as it is their wish and desire to retain the same in their possession’.

Throughout the numerous claims and settlements, the Waikato-Tainui tribe have long maintained the importance of their relationship with the Waikato River. This has involved fighting against the granting of water rights, and fighting for the protection of their rights and interests as the privatisation of assets began (Te Aho, 2010). In 2008, a Deed of Settlement was reached which focused on the restoration and protection of the health and wellbeing of the Waikato River, and introduced the new concept of co-management to the region (Te Aho, 2010). The creation of the Waikato-Tainui Raupatu Claims (Waikato River) Settlement Act 2010 finalised the settlement.

The purpose of the Settlement Act is to:

(a) Give effect to the settlement of raupatu claims under the 2009 deed
(b) Recognise the significance of the Waikato River to Waikato-Tainui
(c) Recognise the vision and strategy for the Waikato River
(d) Establish and grant functions and powers to the Waikato River Authority
(e) Establish the Waikato River Clean-up Trust
(f) Recognise certain customary activities of Waikato-Tainui
(g) Provide co-management arrangements for the Waikato River
(h) Provide redress to Waikato-Tainui relating to certain assets
(i) Recognise redress to Waikato-Tainui of the Kiingitanga Accord and other accords provided for in the schedule of the Kiingitanga Accord

- (Waikato Tainui Raupatu Claims (Waikato River) Settlement Act 2010) (s.4)

Found in Schedule 2 of the Settlement act, the vision and strategy of the WRA is a key part of this piece of legislation. The vision and strategy is the primary direction-setting document for the restoration and protection of the Waikato River. The vision and strategy document in its entirety was inserted directly into the Waikato Regional Policy Statement without having to undergo the processes contained in Schedule 1 of the Resource Management Act 1991- including time limits, public consultations, submissions and hearings (Waikato-Tainui Raupatu Claims Settlement Act 2010, s 11). Section 12 of the Settlement Act clarifies that the vision and strategy document prevails over any Resource Management Act planning documents, including national policy statements, coastal policy
statements, water conservation orders, and any relevant regional and district plans must be consistent with it (Waiakto-Tainui Raupatu Claims Settlement Act 2010, s.12).
Chapter 3 – Conceptual Framework

The conceptual framework for this research will discuss and analyse the concept of sustainability, and review the process and components of sustainability assessment. This sustainability assessment is to be the basis of this dissertation.

3.1 Sustainability

The last century has seen society seek continuous progress, growth and development. However, it was not until the 1970’s that it was recognised that this way of life was being challenged with the threat and risk that this development and growth trajectory posed. In 1972, the Club of Rome’s report ‘Limits to Growth’ shocked all with its revelations and scenario modelling. These showed that if the current growth trends in worldwide industrialization, pollution, food production and resource depletion continue unchecked then we will experience the limits to this growth in the form of global environmental and economic collapse (Meadows, Meadows, Randers, & Behrens, 1972). This growth is causing us to use the world’s resources faster than they can naturally be replenished, while simultaneously discharging wastes faster than they can be absorbed by the Earth - it is a constant reminder that the Earth and its resources are finite and need to be managed wisely (Conca & Dabelko, 2015). For example, in 1972 it was forecast that in the next 100 years we will reach the Earth’s limits and will be faced with sudden and irrepressible population and industrial decline (Meadows et al., 1972). Meadows et al. (1972) discuss the need that if society desires a sustainable outcome over the threat of the Earth’s limits, then this transition from growth to global equilibrium and a sustainable future needs to be pursued sooner rather than later. The report recognised the possibility to reverse the damaging trends by creating a sustainable state for the future by establishing ecological and economic
stability. This *Limits to Growth* report set the stage for a shift to sustainability by raising questions about exponential economic and population growth and demonstrating the need for controlling this with a coherent set of policies that targets these growth models (Vos, 2007).

The concept of sustainability embodies a number of principles including concerns about resource limits, the assimilative capacity of ecosystems, short and long-term impacts of activities, the interconnectedness and interdependence of systems and the need to ensure we do not compromise the livelihoods of future generations (Shrivastave & Berger, 2010). Intergenerational and intragenerational equity are both important sustainability principles. Intergenerational equity is embedded in the Brundtland Commission’s definition of sustainable development with the acknowledgement and need to protect natural resources for future generations. However, it has been recognised that equitable access to resources should not only be between generations, but also within current generations (Vojnovic, 1995).

Over the past three decades the concept of sustainability has gained considerable momentum as governments and organizations in the private sector have moved to incorporate its principles into legislation, policies and plans (Gibson, Hassan, Holtz, Tansey, & Whitelaw, 2005). An important landmark in this paradigm shift was the 1987 report from the World Commission on Environment and Development, known as the Brundtland Commission. This report defined sustainable development as “development that meets the needs of the present without compromising the ability of future generations to meet their own needs” (World Commission on Environment and Development, 1987) (p.23). The Brundtland Commission simultaneously targeted the
environment and development as they were both seen as root problems to the current worldwide levels of poverty and decline of the life supporting capacity of the Earth’s ecosystems and resources. Importantly, they were also envisaged as solutions. It was realised that poverty could not be overcome in a severely degraded and depleted environment, and the environment could not be improved if there is suffering and despair as a result of society’s not being able to provide for their basic levels of wellbeing (Gibson et al., 2005). According to the Brundtland Commission, the aim of development is to build conditions and provide opportunities to allow people to support themselves while also sustaining the life supporting properties of the environment that are the underpinnings of human life (World Commission on Environment and Development, 1987).

Hundreds of definitions have been proposed to try and define sustainable development – by 1989, a paper produced by the World Bank published a list of 60 definitions of sustainable development that were in circulation. By 2000, this had grown to a list of over 100 differing principles, all adopted by a broad range of bodies and sectors (Kemp & Martens, 2007; Zaccai, 2012). However, conflict has often arisen due to its subjectivity and meaning something different for all (Gibson et al., 2005; Jacobs, 1999). Jacobs (1999) describes sustainable development as a ‘contestable concept’, one in which is vague due to the differing values and interests that those of society hold. While the literature contains numerous definitions for sustainability, nearly all share the same core elements and provide a way of looking at environmental considerations in relation to the economy and wider society (Vos, 2007). A precise definition of the term remains unclear.
Sustainable development has come to the forefront of decision making due to decades of development and growth occurring without taking into consideration of effects on the environment and the implications of those environmental effects on society and economies—particularly in developing countries. Striving for sustainability has become an increasingly important goal for all sectors of society due to the depletion of the Earth’s resources and the pressure this is putting on its carrying capacity. The Brundtland Commission raised awareness of the importance of sustainable development, with its definition the most oft-cited in the literature (Vos, 2007). While the Brundtland Commission’s definition is now the central focus of a number of recent definitions, concepts and frameworks (Tscherning, Konig, Schober, Helming, & Sieber, 2008), there is still debate surrounding sustainable development as a concept, what it means and how it should be achieved.

There has also been considerable criticism of the vagueness of the term. Doyle (1998) published a scathing review of the concept, poking at its lack of definition and substance. This criticism has been reflected in many other reviews of sustainable development as a concept (Doyle, 1998; Jacobs, 1999; Kemp & Martens, 2007; Robinson, 2004). Doyle (1998) maintains that sustainable development had succeeded in placing economic imperatives over ecological considerations, and it continues to promote the goals of progress through economic growth and industrialisation. Without a clearer and more defined concept that incorporates all linkages within this complex biophysical system, Doyle (1998) concludes that environmentalists should reject the idea of sustainable development. Jacobs (1999) and Lele (1991) both similarly argue that there is a need to clarify more precisely the ‘meaning’ of the concept in order for it to have a fundamental impact on actions.
Within the environmental debate, Jacobs (1999) maintains that there are three forms of resistance undermining the acceptance of sustainable development. Firstly there is frustration that sustainable development has become a subjective term, and so in reality cannot actually be defined. With this in mind, how can this concept be the centre of environmental legislation and policy if it’s meaning cannot be agreed upon by all? (Jacobs, 1999). Robinson (2004) describes this vagueness as the cause of the many differing definitions as it gives room for the multitude of interpretations.

Secondly, there are those who simply reject sustainable development (Doyle, 1998; Jacobs, 1999). The proposal of economic growth and development, while also being concerned with environmental limits and resource use is considered an oxymoron by many, with some believing it is simply a smokescreen and ploy of business interests to obscure the conflicts between economic growth and ecological integrity (Jacobs, 1999; Robinson, 2004). The third group resisting the concept believe it is simply the wrong approach on the basis it derives from the same sources as the problems it is trying to address (Jacobs, 1999). Robinson (2004) furthers this by describing the concept of sustainable development as a hypocritical approach, due to the difficulty of measuring any actual progress. Instead touting it as “cosmetic environmentalism” (p.374).

Jacobs (1999) makes an interesting argument of describing sustainable development as a contestable concept. While there are many definitions and contestation, there are some principles that override all of it. He explains it as having two levels of interpretation. The first level, while vague the concept is defined by a number of core ideas. These core ideas have universal association with the concept, and despite
differing interpretations held by individuals, they can be agreed on as meaning sustainable development (Jacobs, 1999). The second level of interpretation is where opinions differ, and where arguments are held over how it should be interpreted in practice. Rather than defining key concepts, this level defines the practicality and reflects ones values and interests (Jacobs, 1999). For political and environmental progress, attention needs to be focused on this second level. However there is no point attempting to secure a universal agreement as it will never be achieved. Jacobs (1999) maintains that agreement is only possible on the first level of interpretation, which surrounds the commonly accepted principles contained in the Brundtland Report.

3.2 Contemporary Sustainable Development

The concept of sustainable development became a buzzword in 1987 after the release of the Brundtland Report. Over the last 20 years, priorities and needs have changed and as a response new normative and conceptual perspectives on sustainable development have emerged (Barkemeyer et al. 2004; Sneddon, Howarth & Norgaard, 2006). Rather than being tied into the specific implications of sustainable development, there has been a paradigm shift towards a more generic and wider concept of sustainability (Barkemeyer, Holt, Preuss, & Tsang, 2014). Sneddon et al. (2006) argue that the key to strengthening the concept in this changing environment is to bolster it as a social movement in which the ideas of citizenship, democracy and participation can play a key role in the integration of environmental, social and economic ideas.

The multiple interpretations of the concept have simply identified the need for the further operationalization and contextualization of the term in order to further refine
its scope (Barkemeyer et al., 2014). However in a time where the impacts of environmental degradation are becoming widespread and the threat of the Earth’s limits are looming up on us, irrespective of these criticisms sustainable development is currently the best option we have to guide policy and practice.

Society’s drive for continuous growth and development was challenged in the 1970’s with the release of the Limits to Growth report. Its shocking revelations and threat of environmental and economic collapse set the stage for a paradigm shift to sustainability and raised the question of what level of growth is acceptable, and how do we achieve this? The concept of sustainable development has gained considerable momentum since the Brundtland Commission defined it as the ‘development that meets the needs of the present without compromising future generations’. The literature reflects the vagueness and ambiguity of the concept with hundreds of definitions existing, each reflecting ones interests and values. As society’s priorities have changed over the decades, this has been reflected in the changing paradigms surrounding sustainability. What was once tied up with the specific implications of the concept now needs to become more generic in order to realign with and encompass the continuously changing values of society.

3.2 Sustainability Assessment

Sustainability assessment is a tool gaining popularity in the shift of society towards a more sustainable state and future. It is a process where the implications of an initiative (whether it is a proposed or existing plan, policy or programme) are assessed based on how it affects the sustainable state of society and whether that process has the potential to direct action (Pope, Annandale, & Morrison-Saunders, 2004).
Integration is a key component of sustainability and sustainable development. Hence, when undertaking a sustainability assessment it must be ensured that an integrated approach takes into consideration environmental, economic and social issues and impacts (Pope et al., 2004). Reductionist based approaches prove ineffective when addressing sustainability due to being unable to address the multitude of issues, impacts and concerns, and the inability to capture the whole picture (Gasparatos, El-Haram, & Horner, 2008).

There are numerous ways to undertake a sustainability assessment, however Pope et al. (2004) argue that other approaches such as EIA-led strategic environmental assessment (SEA) and objectives-led SEA do not go far enough in making significant contributions to sustainability as an outcome as they set objectives and assess activities without having a clear direction as to where they wish to head. Without a vision, how will a decision making body know when they have reached a sustainable state or are moving in the correct direction? Pope et al. (2004) have addressed this issue by developing what they characterise as an alternative framework for sustainability assessment. This alternative approach aims to determine if an initiative is sustainable or not by establishing a clear vision of what sustainability means at the outset. This is achieved by developing sustainability criteria which need to be met, which help isolate sustainable outcomes from unsustainable outcomes (Pope et al., 2004). This approach ensures the sustainability assessment is site specific and unique for each situation.

Based on the Pope et al. (2004) sustainability assessment framework, the process of establishing a clear vision of sustainability requires community input, which
encourages the notion of shared responsibility. This is crucial in order to ensure all stakeholders are involved in establishing what sustainability means in the given context (Morrison-Saunders, Pope, Bond, & Retief, 2013). Sustainability is not a destination, rather it is a journey based on the selection of sustainable pathways that are chosen along the way (Curran, 2009). For this reason sustainability assessment cannot definitively assess the chances of a sustainable state being reached. It can simply assess the direction that the proposed policy or programme will head in (Pope, Morrison-Saunders, & Annandale, 2005).

3.3 Establishing Sustainability Criteria

One of the key issues of the sustainability assessment framework developed by Pope et al. (2004) is establishing appropriate sustainability criteria to assess the direction of achieving the vision. Two approaches have been acknowledged by Gibson et al. (2005) and Pope et al. (2004)- criteria based on Triple Bottom Line (TBL) factors, and criteria derived from sustainability principles.

According to Pope et al. (2004) the TBL approach, also known as the ‘bottom up’ approach, and the three pillars approach, assume a state of sustainability when the achievement of a number of environmental, economic and social goals/objectives have been met. The baseline conditions of these three considerations in turn define the objectives and criteria of the sustainability assessment (Pope et. al., 2004). Economic considerations put an emphasis on economic expansion to deal with environmental and social issues, and turn to efficiencies and substitutions to challenge resource depletion and environmental damage. The environmental considerations put an emphasis, among others, on reducing demands on the already stressed natural
resources; protecting and rehabilitating natural systems and reducing consumption. Social considerations recognize the gap between rich and poor, the need to strengthen assets, and the need to provide opportunities to improve the livelihood of people (Gibson et al., 2005).

While the TBL approach is widely understood, there are a number of debates around the difficulties associated with it in terms of establishing sustainability criteria. The first issue is due to the generic framework, it reduces innovation in new sustainability schemes and due to the rigidity of the framework can obscure and miss out case specific issues (Gibson et al., 2005). While the pillars appear to be interconnected and interdependent in theory, in action this integration is difficult due to the traditional pillar framework making it easy to revert back to thinking of these considerations in three separate 'boxes' (Gibson et al., 2005). This approach is also believed to encourage trade-offs due to the assumption that sustainability is about balancing, while also being associated with reductionism (Gasparatos et al., 2008; Gibson, 2006; Pope et al., 2005). Trade-offs should always be a last resort. This is an issue of concern as it not only contradicts the core principles of sustainability and sustainable development, but it also undermines the TBL approach since the three pillars are supposed to be considered as interdependent and mutually supporting (Gibson, 2006).

The alternative is a ‘top-down’ approach to the establishment of sustainability criteria. The vision of what sustainability means is established first, as a state to which society aspires. Criteria are then developed based on this vision (Pope et al., 2004). This approach is site specific, so the criteria and issues identified will be unique at each site. Combined with collaboration among the community, this approach results in
sustainability criteria that are specific and have taken into consideration a holistic perspective (Morrison-Saunders et al., 2013). Morrison-Saunders et al. (2013) and Pope et al. (2004) both discuss this approach as having the most potential in shifting development towards sustainability, as it not only avoids the errors of the TBL approach, but also seeks to reflect society’s views which are particularly important when dealing with subjective terms and outcomes such as sustainability and sustainable development. The key to this approach based on the principles of sustainability, is the design and establishment of the criteria. This is vital as it allows the organisation/society to determine whether or not sustainability has been attained, or is on the right track to be attained (Pope et al., 2005).

In regards to the sustainability assessment of the Waikato River Authority, the vision established to guide the restoration and protection of the Waikato River encapsulates the core principles of sustainable development. The vision itself is a prime example of what Pope et al. (2004) discuss regarding the requirement of a vision that has been created through a collaborative process. The vision and strategy document contains a number of objectives that have been proposed to guide future governance of the river. The objectives and strategies pursued by the Authority are examples of unique criteria based on the principles of sustainability. It was developed through an extensive collaborative process in which the community was encouraged to participate by a number of means (Waikato River Authority, n.d.). As a result, the objectives and strategies developed cover a number of environmental, economic and social issues that have the potential to facilitate change. As an outside practitioner of sorts, this assessment will use a generic framework of criteria based on sustainability.
requirements to assess if this future can be achieved as a result of the strategy and actions currently being implemented
Chapter 4 – Methodology

This research assesses the potential of the WRA to achieve its vision for the Waikato River. An evaluation approach has been adopted by conducting a sustainability assessment of the strategy and actions established and implemented by the Waikato River Authority. Evaluation means assessing what we are doing, evaluating why we are doing it, and assessing how we can make improvements (White, 2006). In this situation, I evaluate the potential of the WRA to achieve its vision.

As discussed by White (2006), there are a number of stages to the research when undertaking an evaluation. The planning phase starts the process off. This involves identifying the problem, who or what are affected, key stakeholders, and what type of data is needed to be collected. This phase also involves a preliminary analysis of the context within which the evaluation will take place; identifying strengths and weaknesses of the body undertaking the evaluation, and also making reference to developments and background information such as legislation, policy initiatives and community and social issues (White, 2006).

Part two of an evaluation addresses methods and techniques. In order to assess whether a difference has been made, data must be readily available before and after implementation of the project/strategy, so benchmarks must be established. This research will be in the form of a formative evaluation. It is prospective (forward looking), and concerned with continuous assessment and on-going feedback as a means to guide further development (White, 2006).
The final phase is determining what to do with the findings once the evaluation has been undertaken. The results of the sustainability assessment will determine if the WRA has the potential to achieve its vision. If the assessment deems that the Authority cannot meet its vision then recommendations will be made on how it can improve its performance and actions to take in the future. Upon completion, findings must be communicated to those concerned.

4.1 Data Collection Methods

To undergo this evaluation data have been collected from a number of sources, specifically, internet records, literature reviews and journal articles; along with public documents such as annual reports of the WRA, the funding strategy and the vision, objectives and strategy document.

Appendix 1 contains the raw data drawn from these documents. The table shows all 108 projects that have received funding from the Waikato River Clean-Up Trust, and have been divided up based on what sustainability criteria they meet. The actions listed in this document have provided the basis of the results for the sustainability assessment.

4.2 Assessment criteria

This assessment is based on a set of decision-making criteria that have been derived from literature on sustainability. Criteria developed by Gibson et al. (2005) consist of eight principles that these authors maintain should be considered as the core requirements of sustainability-based decisions. Gibson et al. (2005) argue that these requirements should serve as the objectives underpinning all strategies for enhancing future wellbeing. While the eight principles are independent in isolation, in theory
they do overlap in many ways and influence each other due to the complex nature of socio-ecological systems.

Gibson et al. (2005) (p. 270) set out their sustainability principles for decision making as follows:

1. **Socio-ecological system integrity**
   Build human-ecological relations to establish and maintain the long term integrity of socio-biophysical systems and protect the life supporting functions upon which human and ecological well being depends.

2. **Livelihood sufficiency and opportunity**
   Ensure and enable everybody and every community to have a decent life, while not compromising future generations.

3. **Intragenerational equity**
   Ensure that sufficiency and effective choices for all are pursued in order to have a decent life, while not compromising the needs of future generations

4. **Intragenerational equity**
   Favour current opportunities and actions that will increase the chance to enhance the capability of future generations to live sustainably.

5. **Resource maintenance and efficiency**
   Ensuring sustainable livelihoods for all, while warranting the efficient use of resources and reducing threats to the long-term integrity of socio-ecological systems.

6. **Socio-ecological civility and democratic governance**
   Build the capacity, motivation and inclination of individuals and communities to apply sustainability requirements through more open and informed
discussions, education and increasing reciprocal awareness and collective responsibility.

7. *Precaution and adaptation*

Design systems that take into consideration the risk of uncertainty, surprise and have the ability to continuously adapt.

8. *Immediate and long term integration*

Apply all principles of sustainability at once, seeking mutually supportive benefits and multiple gains.
Chapter 5- Results

The following chapter outlines the results of the sustainability assessment conducted on the Waikato River Authority. The results have been divided between the eight criteria used in the assessment to assess its potential to achieve its vision.

5.0 Sustainability Assessment of the Waikato River Authority

The sustainability assessment was undertaken to assess the potential for the vision of the Waikato River to be achieved, based on the strategy and actions established and implemented by the Waikato River Authority.

The assessment will focus on the strategy and actions of the WRA to evaluate the potential for the vision of the river’s future to be achieved. This assessment will take an integrated approach, based on the framework established by Pope et al. (2004) The eight sustainability decision making requirements developed by Gibson et. al. (2005) will be used as criteria to conduct the assessment.

The vision and strategy document produced by the WRA is broken into a vision, objectives and strategies for the Waikato River. The vision has set the future state this is being aimed for. Its wording and direction has and will inspire the actions that are necessary to restore the health and wellbeing of the Waikato River. Thirteen objectives have been set in order to realise the vision. These objectives act as goals in which effort and action are directed, which will in turn achieve the overarching vision. Twelve strategies have been implemented in order to achieve these objectives. Both the objectives and the strategy are outlined previously in Chapter 2 (p. 17).
5.1 Criterion 1: Socio-Ecological System Integrity

5.1.1 Assessment of Objectives, Strategies & Actions

Appendix 1 shows the degree of the number of objectives and strategies that have the potential to have a positive effect on the socio-ecological integrity requirement of a sustainable future for the Waikato River.

To date, a number of actions have been put in place as a result of the strategy of the WRA. Through the Waikato River Clean-Up Trust, numerous projects have been funded with the aim of improving ecological health and wellbeing of the Waikato River. Appendix 1 shows a large proportion of the funded activities have the potential to improve the socio-ecological integrity of the river in some way or form. Examples of these funded projects include riparian planting, habitat restoration of eel and whitebait, riverbank clearance of exotic species, pest species control.

Riparian planting and habitat restoration projects are crucial in the steps towards river restoration for numerous reasons, and if undertaken properly will result in progress towards the objectives set. Benefits that can be expected from these projects can include reduction in erosion and bank stabilisation, buffering of nutrients from land uses, maintains a microclimate, provides habitat and protection and can influence life in river’s by providing shade and food (Coolier et al., 1995). In order to aid in the implementation of these riparian funded projects, the WRA (in conjunction with Waikato River Care) released a Riparian Restoration Best Practise Guide to ensure the success of projects and in turn ensure the most efficient use of allocated money. The funded projects will help guide progress towards the desired future state. The vision calls for a “…healthy river that sustains abundant life…” Appendix 1 exhibits
the extent of the objectives and strategies that relate directly to increasing socio-ecological integrity. Including the restoration and protection of the health and wellbeing of the Waikato River, the protection and enhancement of significant sites, fisheries, flora and fauna and the restoration of water quality. While many of the projects are ecological based in action, if successful they will deliver improvements for the social systems reliant on the Waikato River. With improved ecological integrity and water quality, human relationships with the river can be restored.

5.2 Criterion 2: Livelihood Sufficiency and Opportunity

The principle of livelihood sufficiency and opportunity has been incorporated as a criteria of sustainability to ensure that everybody can provide for a decent life and the opportunity to further themselves, while not compromising the ability of future generations (Gibson, 2006).

5.2.1 Assessment of Objectives, Strategies & Actions

The wording of the Waikato River Authority’s vision provides for the improvement of livelihood sufficiency and opportunity of the Waikato community by facilitating the restoration and protection of the river in order to sustain ‘prosperous communities’. Numerous objectives have been set that will help realise this future, including the restoration and protection of the economic, social, cultural and spiritual relationships of iwi and the Waikato community.

Through the strategy and the Clean-Up Trust, a number of projects have been funded that have had a positive effect on the livelihood sufficiency and opportunity of the Waikato community. In the 2013/2014 funding round, $100,000 was allocated to a
project aimed at empowering local communities and providing support for volunteer
groups involved with the restoration of the river. In 2011/2012 money was allocated
towards the establishment of numerous management plans for the environment and
fisheries resources—these are intended to improve the management, use and control of
the natural resources. A number of projects have received funding for the
development of cycleways and public access to and along the Waikato River. In
2011/2012, $150,000 was allocated to a three year project to create an architecturally
landscaped cycle trailway in order to create access for all to the river. Funding has
additionally gone into research regarding the viability and potential of eel production
on the river—economic opportunities such as these have the prime potential to
contribute positively to the livelihoods of those in the community. These projects can
contribute to improving livelihood sufficiency and opportunity by increasing
‘common good’ resources and ensuring all have access to the Waikato River and all it
can offer.

5.3 Criterion 3 & 4: Intergenerational and Intragenerational Equity

Sustaining resources for future generations is important so we do not undermine their
potential to live a sufficient and sustainable livelihood. There is an emphasis on the
need to consider the future in terms of sustainability and resource use, as our needs
should not be the cause of expense for future generations (Ki-moon, 2013). The
fundamental principle underlying intergenerational equity is that each generation
should leave to its successor a planet that is in as good a condition as they themselves
received it in (Ki-moon, 2013). This can be achieved by decreasing the current levels
of resource exploitation, and reducing the stress currently being placed on socio-
ecological systems; in turn, the integrity of these systems will improve to a sustainable state (Gibson, 2006). The WRA need to ensure that equitable access to water of sufficient quality and quantity for current and future generations will be safeguarded.

The current state of the Waikato River, as reviewed in Chapter two paints a significantly different picture with little consideration of adverse effects on future generations, let alone within the same generation.

5.3.1 Assessment of Objectives, Strategy & Actions

Intragenerational equity, and the concern of the fairness within the members of society is poorly represented in objectives and strategy of the WRA. The core of the vision however surrounds the matter of sustaining communities. The objectives can be said to have marginally incorporated it by pursuing the restoration and protection of the economic, social and cultural relationships of the River iwi, Waikato-Tainui and the regions communities with the River. Conversely, by envisioning the protection of the river for generations to come, the requirements for intergenerational equity are firmly incorporated. Appendix 1 refers to the objectives and strategies that integrate both inter-and-intragenerational equity into the restoration and protection of the Waikato River. These include the restoration and protection of relationships with the river, restoration of water quality and improving access. Funding of projects that incorporate these requirements into the programme have been slow. The 2011/2012 funding round saw four projects funded that had the potential to increase intragenerational equity- these included projects such as a community garden, education and the development of a sustainable farming system. These have the
potential to improve equity within the region by helping ensure effective choices are made. Opportunities are improved for communal interaction, access for food and increased educational awareness on how to improve ones way of life.

Many projects have additionally been funded over the three rounds for the development of management plans. These will help provide for short and long term environmental restoration, resource use and economic gain in order to ensure the future protection of the river and its resources. The management and protection resulting from these plans has the potential to not only improve equity but also help safeguard the resource for future generations.

5.4 Criterion 5: Resource Maintenance and Efficiency
5.4.1 Assessment of Objectives, Strategy & Actions

While the vision of the WRA does not direct actions towards the efficient use of resources, it is implied by the restoration and protection aims for the river. The Waikato River is currently in a state of resource depletion and degradation due to the lack of regulation concerning resource use and diffuse pollution occurring within the catchment. The implementation of the Settlement Act has put the vision and strategy of the WRA at a high legislative standing that requires all planning documents to comply with it, along with it being inserted into the Waikato Regional Plan. Hearings commissioners have been appointed by the WRA, who now sit on the board for consents and other applications concerning the Waikato River catchment.

Appendix 1 shows a matrix of the strategies and objectives that concern resource efficiency. The Clean-Up Trust has funded several projects over the three funding
rounds that will have a significant effect on how resources of the Waikato will be utilised. These have included the development of management plans, tools, sustainable farming systems, and an outreach programme aimed to educate farmers in the region on how to get the most out of their land, with little to no downstream effects. In the 2011/2012 funding round, Ruakawa Charitable Trust received $45,885 to develop a sustainable farming system that would help reduce the environmental footprint of farms under the Trust. Further, in 2013/2014, $71,760 was awarded to GHD Limited to develop and provide the WRA with a GIS Toolbox that will allow the Authority to evaluate proposed and ongoing projects and the impacts these are having on the wider catchment and thus will help ensure the efficient use of resources by informing future decision making.

5.5 Criterion 6: Socio-Ecological Civility and Democratic Governance

5.5.1 Assessment of Objectives, Strategy & Actions

Democratic involvement is a key component of the structure of the WRA. Comprehensive public involvement went into the creation of the vision and strategy document created by the WRA. The public were involving in the process by number of hui, public open days, meetings and the calling of submissions (Waikato River Authority, n.d.).

In addition to the public involvement in the guiding document, Appendix 1 exhibits the many objectives and strategies of the WRA that reflect the requirement of socio-ecological civility and democratic governance in the actions implemented. By empowering and including the community in all parts of the restoration and protection of the river, then the greater chance they will take ownership and pride in it. This
change of mindset is needed in order to make headway with the other sustainability requirements, in particular aspects such as the efficient use of resources. The strategies that will work to achieve this are focused on promoting public knowledge, establishing and enhancing relationships and ensuring the information is available for all.

The Clean-Up Fund has funded a number of educational based projects, including a series of seminars for landowners on sustainable farming approaches. The Hamilton City Council received $50,000 to support stream restoration by providing seminars and information to landowners in order to encourage the promotion of restoration activities. The Authority has also worked hard to ensure that the application of maatauranga Maori is used alongside Western Science in order to broaden and inform a greater base of the community. This has been seen in a number of the funded projects due to the priority the Authority put on supporting Maatauranga Maori. It is also important to note that the Authority has endeavoured to reach a wide spectrum of the community, including all ages. In 2012/2013, $147,000 worth of funding was granted to the Trees for Survival Trust for an educational based programme that works with local schools around riparian planting, native species and sustainable approaches.

An important part of this requirement is ensuring the community has faith and trust in the WRA, and can be part of the decision making process. A condition of the WRA is for it to be transparent and fully accountable for the allocation and funding of projects. The WRA ensured community consultation was incorporated the whole way through the process, starting with creation of the vision and the identification of the communities’ priorities and what they want to see in the future. The co-management
approach of the WRA further enhances this community input, by ensuring all sectors of the community can be heard, particularly iwi.

5.6 Criterion 7: Precaution and Adaptation

5.6.1 Assessment of Objectives, Strategy & Actions

The precautionary approach ensures that potential risks have been identified and planned for before possibly significant decisions are made. The integrated, holistic and coordinated approach of the WRA will also help ensure that decisions are well informed and will foster a ‘whole of river’ approach.

The Clean-Up Trust has funded the development of multiple management plans, including environmental, iwi, fisheries and pest species. The development of these plans is extremely beneficial, as it will help direct future decision-making and incorporate an integrated approach to the restoration and protection of the river.

In addition to the development of these management plans, NIWA (in conjunction with the Waikato Raupatu River Trust) received $323,730 in 2012/2013 in order to develop Waikato River Restoration Report Cards and Monitoring tool. These report cards are used to score current states of the environment, in order to then compare future scenarios. By utilising these tools, the WRA will then have the ability to predict how these actions will contribute in shifting the river towards its desired future (NIWA, 2010). The Report Card framework is a holistic and integrated approach to management and will additionally act as a tool to measure progress.
5.7 Criterion 8: Immediate and Long Term Integration

5.7.1 Assessment of Objectives, Strategy & Actions

The immediate and long-term integration of the seven sustainability criteria are neither referred to, nor suggested by the objectives and strategy of the Waikato River Authority. Despite this, this criterion has still been reflected in some of the actions of the Authority- particularly the funding of numerous management plans. The establishment of these plans can ensure that the sustainability criteria – from socio-ecological integrity to the principles of precaution and adaptation - are incorporated into the everyday management and framework that surrounds the actions of the Waikato River. In 2012/2013, the Waikato Regional Council received $100,000 from the Clean-Up Trust to develop and implement a 20 year Waipa River Catchment Plan. These plans are examples of the long-term integration of many of the projects.

<table>
<thead>
<tr>
<th>Sustainability Criteria</th>
<th>Vision</th>
<th>Objectives</th>
<th>Strategy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Socio-ecological system integrity</td>
<td>✓</td>
<td>a, b, c, i, k</td>
<td>1, 3, 6, 7, 9, 10, 12</td>
</tr>
<tr>
<td>Livelihood sufficiency &amp; opportunity</td>
<td>✓</td>
<td>b, c, d, j, l</td>
<td>6, 7, 10, 12</td>
</tr>
<tr>
<td>Intragenerational equity</td>
<td>✓</td>
<td>b, c, d, k, l</td>
<td>6, 12</td>
</tr>
<tr>
<td>Intergenerational equity</td>
<td>✓</td>
<td>b, c, d, f,</td>
<td>6, 12</td>
</tr>
<tr>
<td>Resource maintenance &amp; efficiency</td>
<td>✓</td>
<td>e, h, i</td>
<td>9, 11</td>
</tr>
<tr>
<td>Socio-ecological civility &amp; democratic governance</td>
<td>✓</td>
<td>b, c, d, e, m</td>
<td>1, 5, 6, 7, 8, 10, 11, 12</td>
</tr>
<tr>
<td>Precaution &amp; adaptation</td>
<td></td>
<td>e, f, m</td>
<td>9, 11</td>
</tr>
<tr>
<td>Immediate &amp; long term integration</td>
<td></td>
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</tbody>
</table>

Figure 3: Matrix of aspects of the vision, objectives and strategy that meet the eight sustainability criteria
Chapter 6 – Discussion & Conclusion

The sustainability assessment undertaken in the previous chapter, combined with the conceptual framework surrounding the concepts of sustainability provide valuable insight into whether or not the vision set by the WRA can be achieved based on the numerous objectives, strategies and actions implemented.

The Waikato River has faced, and still does, numerous resource challenges and is currently in a severely degraded state. Decreased ecological integrity, reduced access, upheld flows, high abstraction rates, exploitation and the resulting reduction of cultural ties and community involvement have had a significant effect on the Waikato River and its catchment. With the establishment of the WRA and a new approach to governance, the Waikato River has been given a fresh opportunity to reach a desirable future as per the vision created for it by this Authority. While there is no one-size-fits-all solution to achieving this vision, the Authority has implemented a number of objectives and strategies in order to achieve this future state.

The sustainability assessment show that the WRA is on track to achieve its vision based on the implementation of these objectives, strategies and the actions and projects that put these into fruition (see figure 2 for process). However the sustainability assessment also highlighted that some criteria are weakly represented in the implementation.

The 13 objectives and 12 strategies implemented in order to achieve the vision encompass a broad variety of economic, social, cultural and environmental focuses, to restore the health of the river for the benefit of the community. Appendix 1 displays
how these adequately meet the sustainability criteria - all except the immediate and long-term integration of these requirements.

The key to success for a sustainable future relies on all sustainability requirements being applied equally, immediately and with the future in mind. This is crucial due to the complex nature and mutually supporting characteristics of these biophysical systems. The immediate and long-term integration of the sustainability requirements is not incorporated by the vision, objectives or strategy. The funding of the numerous management plans are the only projects that meet this criteria (Appendix 1). The WRA need to further consider the need to incorporate this into the vision and strategy in order to ensure the mutual inclusion of all sustainability requirements in an integrated manner.

Intragenerational equity is poorly represented in the actions and projects implemented. A sustainable future of the Waikato River would see increased access and equity of the river’s resources, increased common good resources, and the provision of fair and equal decision making processes (Appendix 2). While the Authority has pursued the restoration and protection of the economic, social and cultural relationships of the River through the objectives and strategy, it has not targeted the issue directly at the community level and been put into practise via projects. Currently the Waikato region has a wide spectrum of socioeconomic classes (Ministry for Health, 2008), of which have the potential to undermine the progress towards a sustainable future and desired state for the River. Inequalities among social classes are considered the cause of environmental degradation and thus are a key area to focus efforts on (Beder, 2000). If this sustainability criterion is not achieved, it has
the potential to undermine progress of the other requirements. This criterion requires further consideration to be taken by the Waikato River Authority.

Socio-ecological system integrity is one of the eight sustainability requirements, as it requires communities to build a stable human-ecological relationship in order to establish and maintain the long-term integrity of socio-biophysical systems. The Authority has ensured a focus on the rehabilitation of the ecological aspects of the River. Of the 108 projects funded by the Clean Up Trust to date, the majority have had a key focus on the restoration and rehabilitation of the River and its ecosystems (Appendix 1). Initiatives that have received funding have ranged from riparian restoration, to research into declining species, to working with community groups for riverbank restoration. Future funding decisions should be made strategically in order to improve the ecological integrity of the River system. Schallenberg et al. (2011) have identified four key factors they consider essential components of ecological integrity- nativeness, pristineness, diversity and resilience. The improvement of these components should be the focus of restoration projects receiving funding. As discussed in Chapter 2, the Waikato River is severely degraded and lacking ecological integrity. For these reasons, it is crucial for the WRA to ensure any future funded projects are properly informed in order to ensure best possible results, value for money and to be aware of all future resulting implications for the catchment.

The requirement of livelihood sufficiency and opportunity has been incorporated into the actions of the Waikato River Authority. Numerous projects have been funded that will improve the livelihood of the Waikato communities. Projects have ranged from focusing on the empowerment of local communities to get involved, providing
support and improving access, to the creation of iwi management plans and education for sustainable farming techniques (Appendix 1). Livelihood sufficiency and opportunity is important for the Waikato region in order to ensure all members of society have all basic needs, and equal access and rights in the provision of the Waikato River’s resources. The sustainable future of the Waikato River would see access for all to good quality water, improved cultural relationships with the River and high levels of equity in the provision of goods and choices for individuals (Appendix 2). The river is considered a common pool resource, and in a sustainable future it will be able to support the communities who utilise and rely on it. While the Authority is making considerable progress with meeting this requirement, they could consider the issues associated that have the potential to undermine the reaching of the desired vision. As defined by Bodin, Crona, Thyresson, Golz & Tengo (2014) common pool resources are resources that are shared among numerous groups- in this case, the communities of the Waikato River catchment. The extraction, harm and exploitation by one group, means the resource will be compromised for others (Bodin, Crona, Thyresson, Golz, & Tengo, 2014). In regards to the socio-ecological system stability of the Waikato River, further exploitation will diminish any progress gained and will see the river back to the degraded state we are currently experiencing. The vision puts this responsibility back on the community –“… who are responsible for restoring and protecting the health and wellbeing of the river…” In order for this to be achieved, mutual agreement among society must be reached. The Authority will need to ensure actions are in place in the future to safeguard the resource. This could be achieved by reaching out to the community via further education and community awareness projects.
Planet Earth is made up of limited and finite resources. For this reason, resource use and efficiency needs to be addressed to achieve a sustainable future. Lack of regulation and control of pollution has contributed to the exploitation of the Waikato River. The WRA has addressed this through implementing a vision and strategy document, which has significant legal weight behind it. Its requirement to be adhered to by all relevant planning documents is important in regulating resource use, and setting in place ‘best practice’ approaches. The objectives call for an integrated, holistic and coordinated approach to this management of the River. With the strategy implementing a ‘whole of river’ approach to promote these best practice methods. Through adequate control, the WRA can achieve a future that incorporates this sustainability requirement by ‘doing more with less’ and reducing the reliance on the Waikato River as a resource simply to be used. Process and product redesign can help to realign industry with new sustainable outcomes based on the vision and strategy of the WRA.

Socio-ecological civility and democratic governance has been incorporated into the objectives, strategy and actions of the WRA. Most prominent is the inclusion of strategy to “actively promote and foster public knowledge and understanding of the health and wellbeing of the Waikato River among all sectors of the Waikato regional community”. This has resulted in the funding of a few educational based seminars and workshops for landowners, the development of a cultural framework, and the display of heritage sites for visitors. In order for a sustainable society to be successful, individuals and communities must have the capacity and inclination to be involved in the decision-making processes surrounding them and have the ability to apply these decisions. The key to the success is collective responsibility and an integrated approach to sustainability based decision-making (Gibson, 2006). For this to be
achieved by the Waikato River Authority, the community will need to be mobilized in order to ensure ‘buy in’ and involvement from all. Education of key principles is required in order to build a sense of ecological responsibility and in turn provide the opportunity to be involved in collective decision making (Gibson, 2006). A sustainable future for the Waikato River would see communities ‘sense of place’ and ‘sense of pride’ be built and increased, along with other community centred movements such as an increase in heritage protection and common good resources. Through education, support and consultation, members of society will have the opportunities to become involved in the decision-making system and a shift will be seen in the inherent hope for the future to a more optimistic and forward facing goal reflecting the vision of the Waikato River Authority.

The criterion of precaution and adaptation is accommodated by the objectives and strategies set in place. The WRA has ensured they take an integrated approach to the restoration actions of the River. This has been achieved by the funding of multiple management plans for the catchment. As described by Gibson (2006), the WRA must “plan to learn, design for surprise, and manage for adaptation” (p.174). This assessment has highlighted the importance of adaptive management and the need for it to be investigated further by the WRA. Adaptive management refers to the process of learning by doing, and adapting future actions based on the past lessons learnt (Williams, 2011). Figure 3 refers to the process of adaptive management, depicting that the process is a continuous feedback loop guiding future decision making.
Monitoring is firmly unified within the actions of the WRA. The Authority is required to release an annual report that sets out funding recipients, amount approved and activity types. This process ensures the transparent and accountable allocation of funds, while also allowing the Authority to reflect on the funding round and to look ahead to the upcoming year. A requirement to obtain funding for projects is for all applications to include a monitoring plan. This must include how effects and progress are to be monitored over the course of the project and in the future. In 2011/2012 funding was granted to the Tuwharetoa Maori Trust Board to establish a cultural framework and operational monitoring programme of the vision and strategy in the Tuwharetoa rohe (territory). This monitoring programme is important to assess the current state and the progress being made, however it must be noted that it only spans part of the catchment. To date, no similar projects for the remaining catchment area have been implemented and in turn undermining the 'whole of river approach'. While monitoring of projects is required within the strategy, the effectiveness and review of the vision and strategy is incorporated into the overarching legislation. Sections 18, 19 and 20 of the Settlement Act concern
reviews of the vision and strategy in order to determine if an amendment is required. The WRA within three months of the settlement date were required to review the vision and strategy based on whether or not targets and methods should be developed for inclusion. It is interesting to note that the review that occurred did not deem these targets or methods to be necessary. The use of and meeting of targets have been identified as an effective way to measure progress for sustainable development (Becker, 2004). Section 19 requires subsequent reviews to occur at least five years, and no longer than 10 years after the previous review.

The sustainability requirement for the immediate and long term integration will see all eight sustainability requirements being applied together, while seeking mutually supportive benefits and multiple gains (Gibson, 2006). It is important not to mistake balancing of issues for integration. For success to be gained, any compromises and trade offs that have the potential to undermine progress must be resisted and managed accordingly. The Authority will also need to be aware that the biophysical system of the Waikato River is linked in multiple ways, and impacts in one area have the potential to positive or negatively affect other areas. By incorporating the principles of adaptive management, this can be achieved.

The application of this sustainability assessment has provided a lens through which to assess the management of the Waikato River, and the potential to reach the vision set for it. Since its implementation in 2009, the WRA has made considerable progress in the journey towards the vision set for the future of the Waikato River. When compared to the sustainability criteria of Pope et al. (2004) used in this assessment,
the objectives, strategies and actions put in place have the potential to improve the eight requirements. Areas have been identified where improvements could be made. The following recommendations could be used by the WRA to drive progress towards a sustainable future:

- Incorporate an adaptive management approach into the objectives and strategy. The process will help install continuous feedback loops into the WRA, which will in turn guide future decision-making and provide a link between current monitoring.
- To incorporate methods and targets next review of the vision and strategy. This will not only help guide decision-making, but will help assess the progress being made based on the targets being met, and can in turn be used in conjunction with the adaptive management approach.
- Increase avenues for community input, in order to instil ideas of collective responsibility and sense of pride and belonging.
- Increase educational based funding projects. For the vision of the WRA to be realised, a change in behaviour is required for users. This shift in behaviour will only be reached by adequate awareness and education reaching the community.
- Develop policies that will lead to the reduction of resource use and waste. Increase focus on “doing more with less”, and reducing the reliance on the river as a resource to be used.
- Ensure all eight sustainability criteria are being met in subsequent Clean Up Trust funding round.
The 30-year time span of the WRA and its funding needs to be considered further. As previously mentioned, sustainability is a journey, and not a destination. As a result, time frames cannot be put on these types of goals. It needs to be investigated further what the WRA plans are once this time period is up. Will funding cease? Will the co-governance structure of the WRA remain? What state is the Waikato River expected to be in by this point in time? The future implications could be significant if these questions are not factored into decision making now.

In addition, this sustainability assessment has been undertaken at relatively the start of the journey the WRA is taking to restore and protect the Waikato River. As the WRA continue to make decisions and guide restoration, additional and recurring sustainability assessments will be required to ensure the actions implemented continue to strive and meet the desired vision. Processes such as this should be incorporated into the review and monitoring of the WRA.

It must be noted; concepts such as sustainability are extremely ambiguous and as a result make it difficult to assess. This research has not attempted to define sustainability. Rather, it has provided a review and synthesis of the literature and the framework developed by Pope et al. (2004) and determined the vision established by the WRA can be said to be its own unique definition of what a sustainable future would look like for the Waikato River. There is not, and will never be a ‘one-size-fits-all’ solution/definition for sustainability, and for this reason it is important to ensure sustainability meets the requirements and needs of those affected by the decisions. It must be remembered that sustainability is a journey, not a destination. Thus, it cannot
be measured, simple as that. You can however assess the direction the action, policy or programme is heading, and the contribution it will make to a sustainable future.
Reference List


Appendix 1 – Funded projects meeting sustainability criteria
Appendix 2 – A sustainable Waikato River