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## **Ethnicity and views about the New Zealand environment**

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## **Abstract**

Limited research has been completed on the relationship between ethnicity and views within a country on the environment, pressures on the environment and its management. Some recent New Zealand research has found no significant difference in environmental world views between different ethnic groupings. We report selected results from a decade of biennial, nationwide surveys of adults in New Zealand. By socio-demographic measures, respondents are broadly representative of New Zealand adults. In each biennial survey we have found significant differences between ethnicities in views on water quality, causes of damage to water, and water management. There are also significant differences between ethnicities in participation in environmental activities. Our survey has an advantage over other work in that it is able to distinguish between indigenous New Zealanders and native-born New Zealanders, a distinction that proved helpful in identifying these significant differences.

**Keywords:** ethnicity, environment, New Zealand, water, perceptions

## **1. Introduction**

New Zealand is the only country where a national Treaty (of Waitangi, 1840) has been signed between the indigenous peoples (Maori in this case) and the colonisers (represented in this case by the Crown). The Treaty is enshrined in the laws of New Zealand including in its Resource Management Act (1991), with major obligations on the Crown to protect the country's natural resources. There is an ongoing interest in the extent to which such protection is occurring. New Zealand is a multi-racial nation, and at times has large immigration flows. In the 2013 Census 25.1% of people were born outside New Zealand, and 36.9% of people were of non-European ethnicity (Statistics New Zealand 2013). Within this context there is national level interest in the extent to which there is or is not any relationship between ethnicity and peoples' connections to the natural environment.

Several studies have investigated whether there is a relationship between ethnicity and attitudes toward, and perceptions of the environment within a country. Examples include (Rauwald and Moore, 2002; Leung and Rice, 2002; Johnson et al., 2004; Vikan et al., 2007). These studies routinely report the existence of significant relationships between people of different ethnic origins, but within a wide diversity of contexts. Most studies investigating a possible link between ethnicity and views on the environment have employed the New Environmental Paradigm (NEP) survey instrument. In New Zealand, Lovelock et al. (2013) have undertaken a similar study, also using the NEP.

Lovelock et al. (2013) compared the environmental values of immigrant and native-born New Zealanders, but had insufficient data to identify Maori as a separate group in their analysis. They employed the New Environmental Paradigm (NEP) as their base research instrument and explored a variety of theories in analysing and interpreting their findings. Their overall conclusion is that 'there was no significant difference in the environmental world views of immigrant and native-born New Zealanders' (Lovelock et al. 2013: 402). Other research in New Zealand has tangentially addressed this question, but from a different perspective, and using different analytical frameworks. This research, namely the Hughey et al. (2001, 2002, 2004, 2006, 2008, 2010, 2013) biennial (now triennial) survey of peoples' perceptions of the New Zealand environment, has been measuring peoples' perceptions of 11 natural resources including their management, and has collected data on a range of demographic variables including ethnicity. These data provide the opportunity to evaluate, using a different framework, the relationship between ethnicity and the natural environment.

In this paper we look briefly at the related literature, then at the methods used by Lovelock et al. (2013) and Hughey et al. (multiple years). We report then on some of the Hughey et al. findings, and key differences between these and the Lovelock et al. (2013) findings, and particularly resource management implications from such findings.

## **2. Comparative survey methods**

Lovelock et al. (2013) used a paper-based questionnaire that was administered in two ways: first, a version in English was posted to a random sample of 1000 potential respondents in two large cities (Auckland and Wellington); the second was delivered to 1000 targeted migrant respondents, including a Chinese language version, in the same cities. The reported overall response rate of 21.6% was considered ‘acceptable for a general population survey undertaken by postal survey’ (p409), although it should be noted that half the surveys were targeted and not applied to a randomised cross section thus suggesting a lower effective response rate. And, as noted above, their survey applied the NEP.

The first Hughey et al. (2001) biennial survey of New Zealanders’ perceptions of the State of the Environment was performed in 2000 using a survey questionnaire constructed around the Pressure-State-Response (PSR) model of environmental reporting. Hughey et al. (2001) provides background, justification of the survey approach used, and results. The OECD (1996) and Ministry for the Environment (1997) explain the PSR model, which is used internationally as the basis for environmental reporting. The model is used primarily in reporting biophysical monitoring data – the Hughey et al. translation of the model into the perceptions arena required taking a broad ‘socially constructed’ interpretation of each of the key components of the model, i.e., ‘pressure’, ‘state’ and ‘response’. For example, state included, for some resources, both condition and amount, either individually or in combination.

Hughey et al. report on 11 ‘natural’ resources, but in this paper we report primarily on views on ethnicity and water related matters. This choice is prompted by water being a very topical environmental management issue in New Zealand (e.g., Cullen et al., 2006; Hughey et al., 2007; Land and Water Forum, 2010), water generally being important to people of all ethnicities, and water being a component of several case studies undertaken as part of the ongoing series of surveys.

Further questions supplemented the PSR framework, including 12 that sought demographic information. A question on ethnic origin was introduced in 2002. It revealed substantial differences between ethnic groups in responses to some questions. The question was retained in following surveys, with an Asian ethnic origin category being included from the 2006 survey. In this paper we report results only from the 2006, 2008 and 2010 surveys, to provide a more direct comparison to the findings of Lovelock et al. (2013).

There are important differences in the respective treatments of ethnicity between the Lovelock et al. (2013) and Hughey et al. surveys. Four categories for analysis were identified in the former, namely NZ European, European, Chinese, and Other. In the latter, three categories, NZ European, Maori and Other, were identified. In effect the only common grouping is NZ European. Lovelock et al. (2013: 408) rightly conclude that ‘merging the other ethnicities into one “Other” category is, of course, far from the ideal approach ...’. We concur also in terms of the Hughey et al. approach but note the added advantage of having a response rate high enough to include a separate indigenous Maori category. Irrespective of these differences we believe there is merit in continuing to explore whether or not there are differences between ethnic groupings and their perceptions of the environment.

There are differences between the studies also in terms of data analysis. Lovelock et al. (2013) used Principal Component Analysis to examine relationships against the NEP. By

contrast Hughey et al. have used Chi-square tests ( $\chi^2$ ) to differences between environmental perceptions and ethnicity. For the latter data aggregation was necessary in some areas because there were too few valid responses to enable robust tests to be applied. Due to the very large number of relationships tested, in general only summarised results for significant relationships ( $P < 0.05$  or greater) were reported.

### 3. Results

#### *Water quality*

In 2010 we evaluated the quality of water in rivers and streams, and in lakes, against ethnicity (Figure 1). The key findings are:

- A significant difference in responses by ethnicity was found for all national-level evaluations ( $p < 0.01$  for rivers and streams;  $p = 0.05$  for aquifers;  $p < 0.05$  for lakes);
- Maori are more negative about all freshwater resources on a national level;
- People of Other ethnicities are always the most positive.

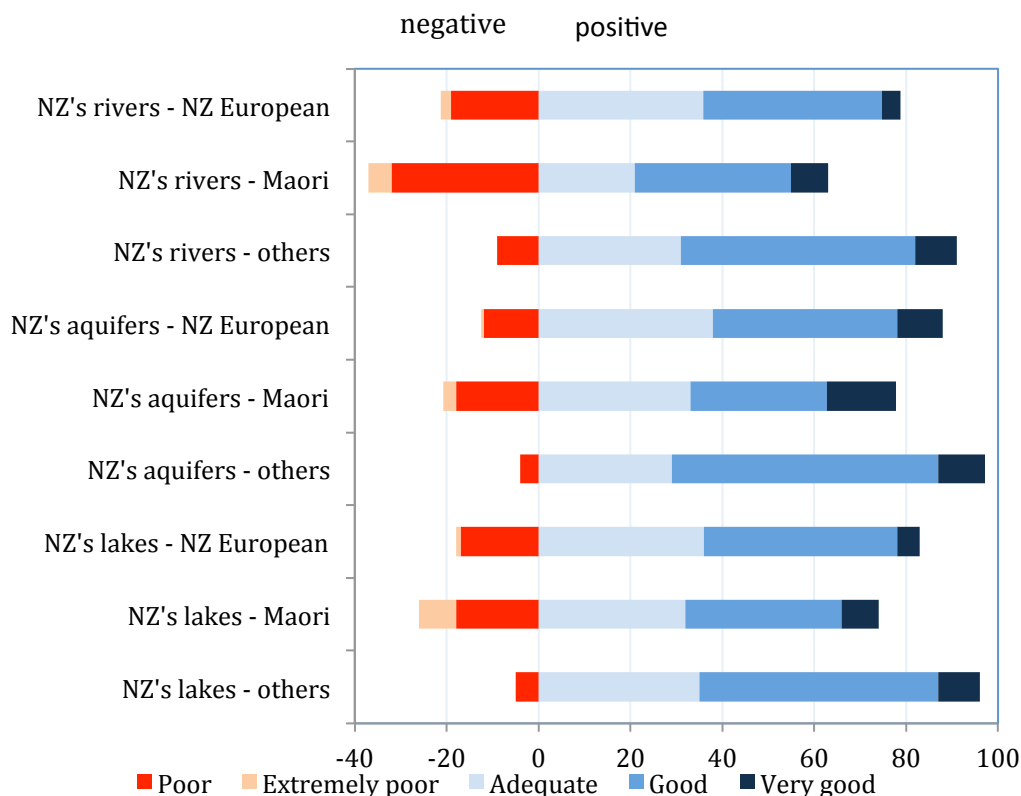


Figure 1. Analysis of ethnic variability in perceptions of water quality in New Zealand (Note the categories 'extremely good' and 'good' and 'poor' and 'extremely poor' were combined for statistical analysis, and that 'don't know' responses have been removed.)

#### *Causes of damage to water*

Differences have been explored between ethnic group ratings of main causes of damage to fresh waters. In the 2010 study there were three significant differences when ethnicity was evaluated against fresh water (Figure 2). New Zealand Europeans were much more likely than Others or Maori to have selected farming as a key cause of damage to fresh waters ( $p < 0.01$ ). Those of Other ethnicities were more likely to have identified household waste and emissions ( $p < 0.001$ ) or dumping of solid waste ( $p < 0.05$ ), than were Maori or New Zealand European respondents.

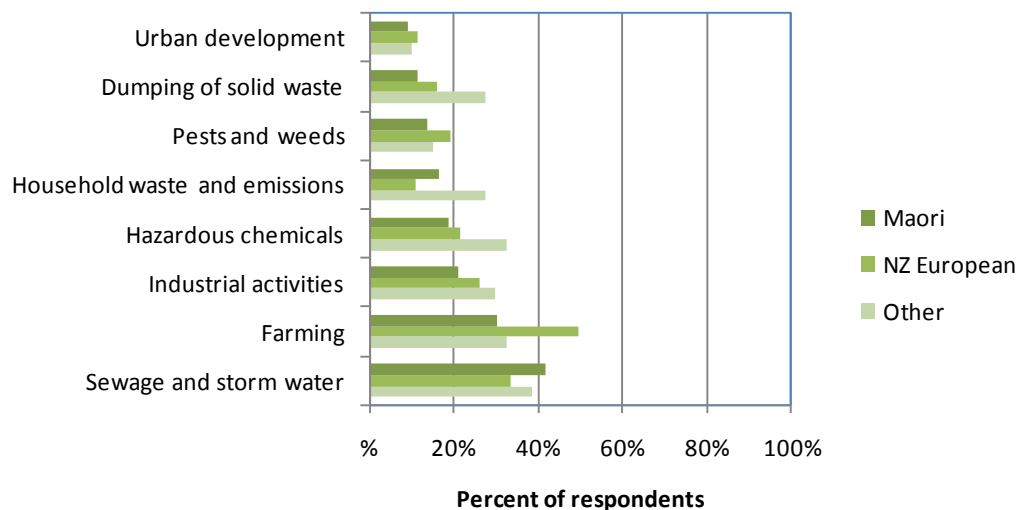


Figure 2. Perceived main causes of damage to fresh waters, by ethnicity. Categories less than 10% are omitted.

### Management of water

Outcomes from using different management approaches for water were explored in 2010. Eleven directional statements containing different ideas about the sorts of outcomes that may or may not be achievable with different approaches or combinations of management approaches, were given to 2010 respondents to evaluate on a scale of 1-5 (with 1= 'strongly agree' and 5= 'strongly disagree') supported by a 'don't know' option. The relative distribution of responses to these statements is shown in Figure 3. Strongest support occurred for statements a, c, d, and j. These responses indicate a belief that voluntary mechanisms 'don't work', regulations and pricing do, and combinations of approaches work well.

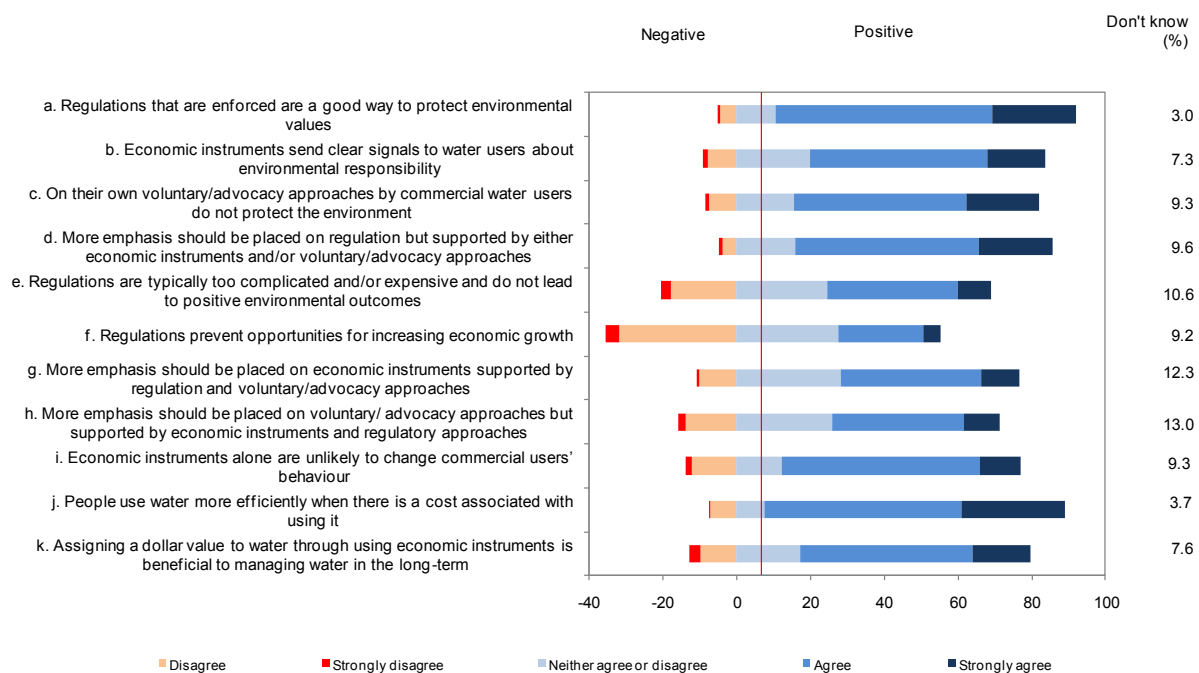


Figure 3. Respondents' agreement or disagreement to 11 statements regarding management approaches and their likely outcomes.

Five significant relationships were found when each of the above statements was cross tabulated against ethnicity (note that in this analysis ‘strongly agree’ and ‘agree’, and ‘disagree’ and ‘strongly disagree’ were combined):

- Maori were more likely ( $p<0.05$ ) to disagree with the statement that ‘regulations prevent opportunities for increasing economic growth’ than were New Zealand European, or Other ethnicities respondents;
- New Zealand Europeans and Other ethnicity respondents were more likely to agree with the statement that ‘on their own voluntary/advocacy approaches by commercial water users do not protect the environment’, than were Maori ( $p<0.05$ );
- New Zealand Europeans and Other ethnicities were more strongly ( $p<0.05$ ) supportive of the statement ‘More emphasis should be placed on economic instruments supported by regulation and voluntary/advocacy approaches’ than were Maori;
- New Zealand Europeans and Other ethnicities were more strongly ( $p<0.01$ ) supportive of the statement ‘People use water more efficiently when there is a cost associated with using it’ approaches than were Maori;
- Maori were more likely ( $p=0.01$ ) to disagree with the statement ‘Assigning a dollar value to water through using economic instruments is beneficial to managing water in the long-term’ than were NZ European or Other ethnicity respondents.

### *Water values and futures*

Respondents in the 2008 survey were given nine statements regarding the future for fresh waters in New Zealand to which they could respond on a 5-point Likert scale, anchored by ‘strongly agree’ (1) and ‘strongly disagree’ (5), alongside a ‘don’t know’ option. Figure 4 shows the distribution of responses to the different statements. Respondents clearly support futures with largely unpolluted waters that are swimmable – they will not accept the loss of native freshwater species and clearly do not believe the main emphasis of freshwater management should be economic. Equally, respondents disagree strongly with the proposition that ‘we should accept some reduction in environmental values of some freshwater resources in order to enhance economic benefits from their use’.

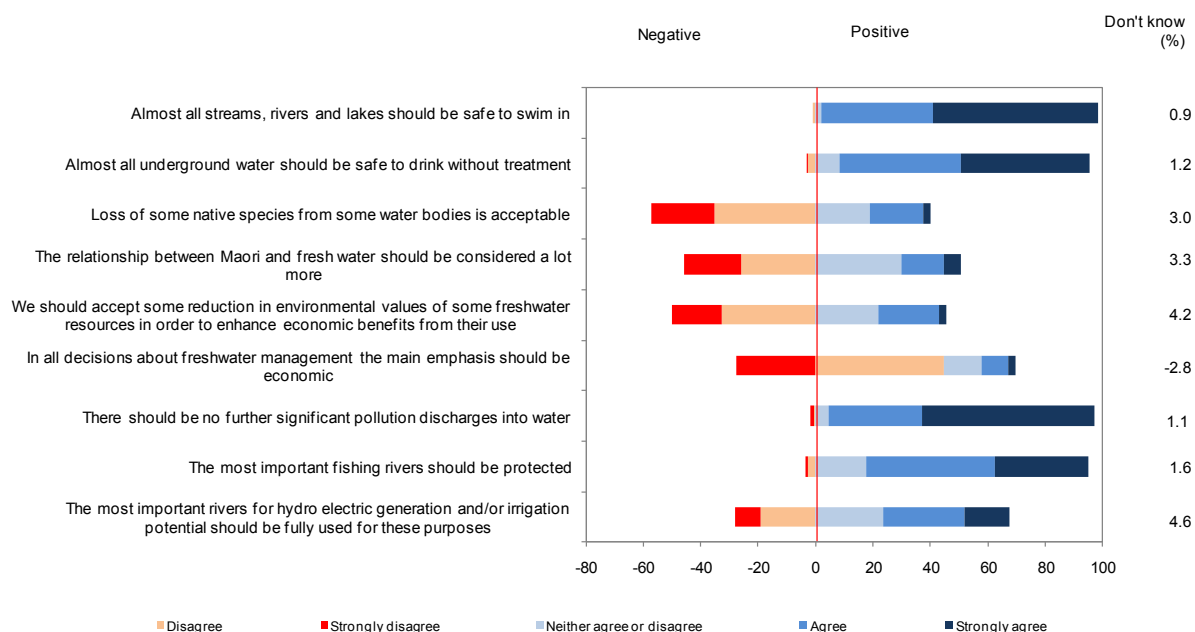


Figure 4. Perceptions of desired futures for fresh water (Source: Hughey et al. 2008).

Two significant relationships were found when each of the above statements was analysed against ethnicity (note that in this analysis ‘strongly agree’ and ‘agree’, and ‘disagree’ and ‘strongly disagree’ were combined):

- Far more Maori (73%) disagreed with the statement ‘Loss of some native species from some water bodies is acceptable’ than did New Zealand Europeans (58%) or people of Other ethnicities (55%) ( $p < 0.05$ );
- Maori were much more likely (70% agreement;  $p < 0.001$ ) than New Zealand Europeans (17% agreement) or people of Other ethnicities (18% agreement) to support the statement ‘The relationship between Maori and fresh water should be considered a lot more’.

A related question explored respondents’ views on 14 aspects regarding the state, use and ongoing management direction of fresh water (Figure 5).

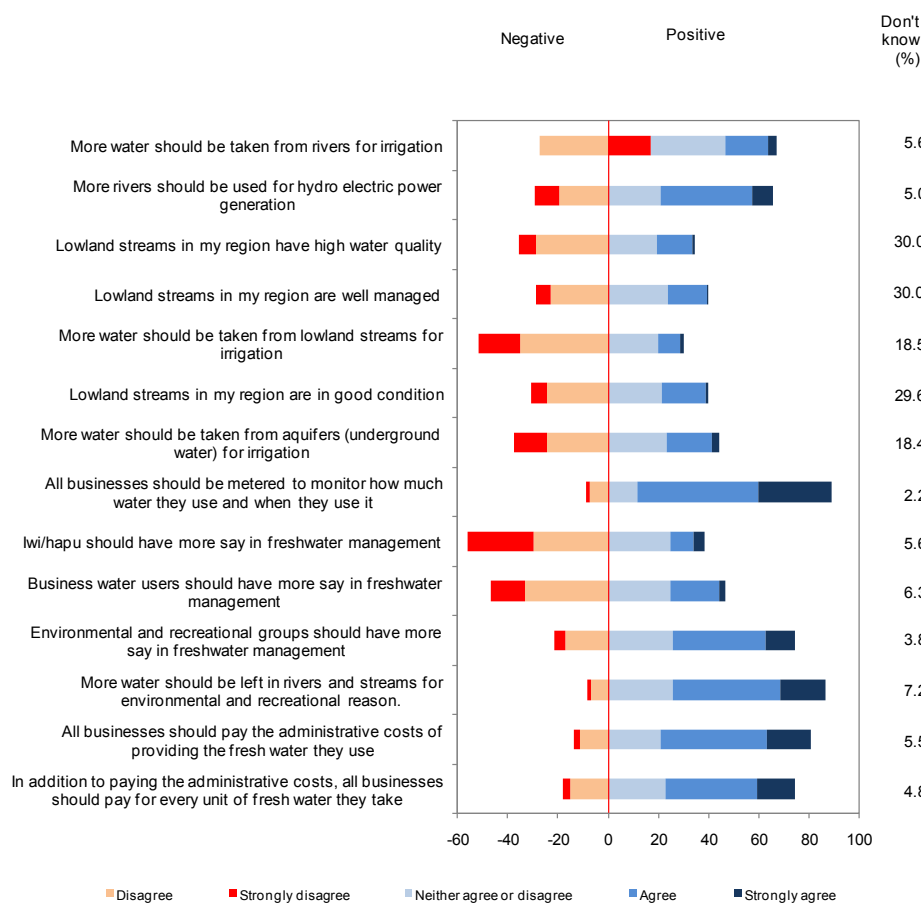


Figure 5. Perceptions of aspects of the state, future use and management of fresh water (Source: Hughey et al. 2008)

The 14 statements were each evaluated against ethnicity with seven significant relationships found (note that in this analysis ‘strongly agree’ and ‘agree’, and ‘disagree’ and ‘strongly disagree’ were combined):

- People of Other ethnicities were less likely ( $p < 0.05$ ) to disagree with the statement ‘More water should be taken from rivers for irrigation’ than were New Zealand Europeans or Maori;
- Maori and New Zealand Europeans were more likely ( $p = 0.01$ ) than people of Other ethnicities to disagree with the statement ‘More rivers should be used for hydro electric power generation’;



- People of Other ethnicities were less likely ( $p<0.05$ ) to disagree with the statement 'Small lowland streams in my region have high quality water' than were New Zealand Europeans or Maori;
- Maori and New Zealand Europeans were much more likely to disagree (64% and 67% respectively;  $p<0.001$ ) with the statement 'More water should be taken from lowland streams for irrigation' than were people of Other ethnicities (34%);
- Maori and New Zealand Europeans were more likely ( $p=0.05$ ) to disagree with the statement 'Lowland streams in my region are in good condition' than were Other ethnicity respondents;
- Maori were much more likely ( $p<0.001$ ) to agree that 'Iwi/hapu should have more say in freshwater management' than all other respondents;
- Other ethnicity respondents were less opposed to the statement that 'Business water users should have more say in freshwater management, whereas over half the other respondents disagreed ( $p<0.05$ ).

#### *Participation in environmental activities*

Participation in a range of environmental activities has been monitored by our surveys since 2000. Figure 6 shows levels of participation in 15 environment related activities during the preceding twelve months. Two activities added to the survey in 2006 were 'Reduced or limited your use of freshwater' (60.6% participation) and 'Made a financial donation to a non government environmental organisation (e.g., Forest and Bird)' (24.3% participation).

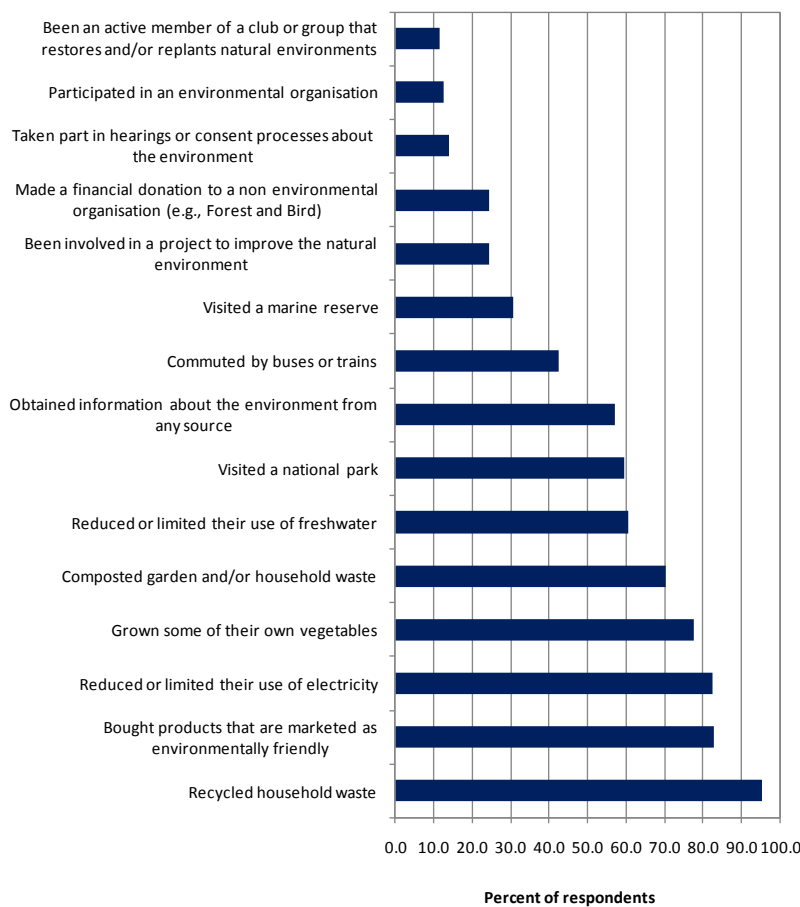


Figure 6. Reported participation in environmental activities, 2010.

Rates of participation were evaluated against ethnicity, with significant relationships shown below:

- Maori (76%) had higher reported participation rates than Other ethnicities (73%) or New Zealand Europeans (58%) in terms of reducing or limited their use of freshwater ( $p < 0.01$ );
- Maori (33%) had higher participation rates in projects to improve the natural environment than either New Zealand Europeans (26%) or Other ethnicities (14%) ( $p < 0.05$ );
- New Zealand Europeans (80%) participated more often in growing some of their own vegetables than did Maori (77%) or Other ethnicities (62%) ( $p < 0.01$ ); and
- Maori report a higher rate of participation (38%) in making a donation to a non government environmental organisation than do New Zealand European (25%) or Other ethnicities (15%) ( $p < 0.05$ ).

In a complementary analysis Hughey et al. (in prep.) pooled multiple years of survey responses for this question and developed a Binary Logit Model. The model allowed identification of respondent-related attributes that affect the probability of undertaking the action, whilst controlling for other factors. That is a more informative approach than two-way correlations or chi-squared tests used in this paper as it controls for factors such as age, education and income. The most significant correlations were between birthplace and ethnicity. Results from that model showed that Other ethnicities are more likely than NZ Europeans to have attempted to save electricity, to save water and to have sought a resource use consent. They are less likely than NZ Europeans to have grown their own vegetables. Maori are more likely than NZ Europeans to have undertaken many of these activities. Birthplace has no significant effect on involvement in these activities.

#### *Overall trends*

The significant results above represent 22 specific different environmental relationships, from four broad areas, namely:

- State or condition of freshwater – Maori respondents had a more negative view of the water quality of New Zealand's rivers, groundwater and lakes than did New Zealand Europeans, who in turn were more negative than Other ethnicities. Regarding small lowland streams in the respondents' regions the responses were slightly less clear – New Zealand Europeans and Maori were both typically more negative than were responses from Other ethnicities.
- Pressures on freshwater – New Zealand European respondents were far more likely than either Maori or Other ethnicities to identify farming as a major cause of damage to freshwater. The research literature is unequivocal – farming is the major cause (see for example Hughey et al. 2007);
- Management responses – a variety of questions looked at response including from a policy option perspective and from the context of participation in environmentally related activities. Interpreting the results from the ten relationships that explored policy options or management priorities is challenging. Overall, however, Maori tend to be more negative toward responses that would strengthen business input, put a price on water, or involve more hydro or irrigation development of water. Conversely Maori are strongly supportive of having more involvement in management. In terms of participation in specific activities Maori reported higher levels of involvement in three out of four activities than either New Zealand Europeans or Other ethnicities who were typically less involved.

- Values of freshwater – Maori and New Zealand Europeans were far more negative than Other ethnicities about the potential loss of native freshwater species, while Maori agreed strongly that the relationship between Maori and freshwater should be considered more in decision making.

This summary of the key findings indicates clearly the close link between Maori and the environment, and also that typically Maori and New Zealand Europeans have higher levels of concern about freshwater issues than do Other ethnicities.

#### **4. Discussion and conclusion**

The main aim of this research is to determine the extent of ethnicity – natural resource relationships, concentrating on freshwater and then comparing the findings with Lovelock et al. (2013) and related international research.

Several studies have investigated if there is a relationship between ethnicity and views about the environment. Rauwald and Moore (2002) found that Trinidadians showed the strongest pro-environmental attitudes by way of endorsement of New Environmental Paradigm values, and both Trinidadians and Dominicans showed stronger pro-environmental attitudes than did Americans as indicated by their support for NEP values. Leung and Rice (2002) found that Chinese Australians and Anglo Australian students differed in their environmental concern and in their endorsement of NEP values. Chinese Australian students who identified themselves as Asian or Chinese were less likely to participate in environmental activities than were students who did not identify themselves with any ethnicity. Vikan et al. (2007) found that Brazilian students as a unit showed higher support for NEP values than did Norwegian students.

Johnson et al. (2004) used data from a national survey of randomly selected adults. They focused mainly on ethnic variation in environmental belief, as measured by the NEP and ethnic variation for four environmental behaviors: environmental reading, household recycling, environmental group joining, and participation in nature-based outdoor recreation. They report that Blacks and foreign-born Latinos were less likely than Whites to score higher on the NEP. Johnson et al. (2004) find that Asian American and U.S.-born Latino environmentalism was most similar to that of Whites while African American concern and behavior was least similar to White environmentalism.

Lovelock et al. (2013) test for differences between values of immigrants and native-born New Zealanders and between people of different ethnicities, by measuring support for NEP values. Their sample (n = 427) constrains their statistical analysis to four ethnicities: NZ European, European, Chinese and Other. There are insufficient Maori in their sample to use that ethnicity in the statistical analysis. They conclude that overall, New Zealand-born respondents and immigrants have similar worldviews (are mildly ecocentric), as do the respondents to their survey across different ethnicities. European New Zealanders have scores statistically indiscernible from the ethnic minority groups Europeans, Chinese, and Other ethnicities. The results of Lovelock et al. (2013: 143) clearly differ from those of the four other studies summarized above.

Six biennial nationwide surveys of New Zealand adults (Hughey et al. 2001, 2002, 2004, 2006, 2008, 2010) have found there are significant differences between people of different ethnicities, including differences between indigenous Maori and New Zealand European respondents, in their views about some aspects of the environment. Typically these differences reflect a continuum – Maori have closer links to the natural environment and are more concerned about its state and management direction than are New Zealand European than in turn are Other ethnicity respondents. The Hughey et al. result supports those of Rauwald and Moore (2002), Leung and Rice (2002), Johnson et al. (2004), and Vikan et al.

(2007) but differs sharply from that of Lovelock et al. (2013). The six Hughey et al. studies use a Pressure-State-Response approach to measure views about the environment and its management, in contrast to the univariate NEP approach used in the five studies listed above.

The focus on water and its management and on participation in environmental activities is the second difference between the Hughey et al. studies reported in this paper and the earlier studies noted above. While noting those distinguishing factors, we observe that our research supports the finding of all but one study we have reviewed, that ethnicity has a significant role explaining views on the environment within a country. We observe further that explicitly separating colonising cultures/ethnicities from indigenous cultures/ethnicities leads to further explanatory potential and should be included, where appropriate, in future studies of this type.

The Resource Management Act (1991) provides the framework for resource use and management in New Zealand. Obligations to consult Maori are specified through statutory legislation and through case law in the Environment Court. Consultation, or the need to consult, arises from the principle of partnership in the Treaty of Waitangi; this requires the partners to act reasonably and to make informed decisions. (<http://qualityplanning.org.nz/index.php/plan-development-components/10-useful-links/367-treaty-of-waitangi-obligations>). Appropriate consultation can help to avoid time delays, unnecessary costs for resource consent applicants, misinformation and conflicts, unrealistic expectations by tangata whenua (local Maori), council, and applicants.

Environmental management is likely to be more complicated where environmental values differ between people of differing ethnicities. Our research has consistently found clear differences in environmental values held by New Zealand Europeans, Maori and Other ethnicities, including over acceptable uses for water, preferred ways to manage water, and willingness to tradeoff environmental attributes for economic benefits. Recognition of differences in environmental values may be helpful in understanding public concern over the state of the environment, development of suitable environmental management approaches, gaining public support for environmental management methods and acceptance of environmental outcomes.

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