

## Eliciting New Zealand hill country farmers' decisions to participate in a voluntary soil conservation strategy

Neels Botha<sup>1</sup> and Hein Roth<sup>2</sup>

<sup>1</sup> AgResearch Ltd, Private Bag 3123, Hamilton, New Zealand 3240

<sup>2</sup> Omega Consulting Ltd, PO Box 4699, Mt Maunganui, Tauranga 3030

Email: [neels.botha@agresearch.co.nz](mailto:neels.botha@agresearch.co.nz)

### Introduction

Managing the effects of using freshwater and land is one of the responsibilities of New Zealand's 12 Regional Councils, while the Department of Conservation is responsible for the conservation of New Zealand's natural and historic heritage. New Zealand has a small open and export driven economy that is sensitive to and dependent upon international markets (Ministry for the Environment n.d.; New Zealand facts 2010). Preserving this market is important and the pastoral industry is working hard to retain its clean and green image by encouraging and supporting economic and environmentally friendly farming systems that also provide an acceptable lifestyle. New Zealand society is losing its patience with the negative impacts that some farming practices have on the environment and Regional Councils have been responding to increasing levels of societal pressure on them to address the situation (Penno and McLeish 2002).

One area where this has occurred is the Manawatu/Wanganui Region, a location governed by the "Horizons" Regional Council. This region is situated towards the lower west coast of the North Island. The foundation of the region's economy is pasture-based farming (dairy, sheep and beef). The area consists of approximately 1.6 million hectares of land classified as hill country, 300,000 hectares of which is highly susceptible to erosion. Such susceptibility became apparent in 2004, when several major storms impacted 100,000 hectares of hill country, causing two hundred million tonnes of soil erosion throughout the region and 30 million tonnes of sediment to enter the local rivers (Horizons Regional Council 2007). Aside from storms, past land resource management practices (e.g. vegetation clearance) have added to problems surrounding the long-term sustainability of the region's land and soils.

Against the above contextual backdrop, and in an effort to better protect and conserve local soil resources, the Horizons Regional Council have identified 1,500 farms consisting of 'Highly Erodible Land' (HEL). They have also introduced a voluntary initiative broadly aimed at encouraging a move to more sustainable land use practices across the region. This voluntary program called the 'Sustainable Land Use Initiative' (SLUI). The specific objectives of the initiative are to identify and incentivise opportunities for sustainable land use change on these farms and to encourage farmers to farm responsibly from an environmental perspective (ibid). One key component of SLUI is the development of fully subsidised Whole Farm Plans (WFPs) for properties consisting of HEL. To date, however, only 159 WFPs have been developed, indicating low farmer involvement in the Regional Council's initiative. The question we seek to address in this paper is why more farmers are not participating in the WFP conservancy strategy? To investigate this question, we explored the farmer decision making process, with a specific focus on their decision to participate or abstain from opting into the Regional Council's initiative.

### Aims

The research aims were to: (1) describe hill country farmers' adoption decision-making process regarding WFP; (2) identify at what stage of the decision-making process non-participants chose not to participate; (3) elicit guidelines for enhancing participation.

### *Criteria for successful farmer engagement*

The vast extension literature provides broad guidelines about how to better engage farmers in activities and initiatives developed to enhance productivity and improve sustainability. For any voluntary behaviour change strategy like extension to succeed, a sense of urgency around the need for change has to exist (Kotter 1996), social support for the change is required (Brown et.al., 2008), as well as personal responsibility (Botha 2008(a); Parminter et al. 2007). Open, honest, and consistent communication by the change agent is required, the target group has to acknowledge the importance of the issue, be committed to addressing it and have the desire to see the change through to its completion (Kotter 1996). It also requires change agents to develop a sincere and genuine understanding of the views and concerns of the target group (Peoples, 2008). With both parties working in collaboration with each other, the aim is to develop a relationship of trust and co-operation (Blackett and Botha 2007) and to identify appropriate means for effectively addressing the issue. A close fit between the solution and the

farming system encourages buy-in (Botha 2008(b); Kotter 1996), with the proposed solution seen to be an option to realistically solve (or help solve) the issue (Brown et al. 2008), and the cost, benefits, and implications of the solutions must be clear (Bewsell et al. 2008; Brown et al. 2008). Finally, user confidence is important (Botha 2008(b)).

### **Methodology and research approach**

This research used the ethnographic decision tree modelling (EDTM) approach developed by Gladwin (1989). EDTM describes adoption as a cognitive process; it identifies specific decision criteria and is a descriptive and predictive model that examines real world decisions and the criteria that influence them (Darnhofer and Schneeberger 2005; Gladwin 1989; Murray-Prior 1998). EDTM is based on open-ended individual ethnographic interviews that elicit and investigate specific decision criteria from decision makers themselves. The outcome of EDTM is to develop a decision tree, table, or set of decision rules (Beck 2005). Ethnographic interviewing acknowledges participants' expertise and their beliefs as they relate to the specific decision to be made. As such, it explores participants' thinking and describes and diagrams, in their own terms, the reasons for their actions.

EDTM consists of three phases (i.e. Exploration, Model Development and Model Testing) and enables the researcher to obtain a deep and complex understanding of the criteria that influence participants' decision-making with regards to a specific subject. The aim is to develop an inclusive decision tree with research participants by eliciting a series of connecting decision criteria on the decision that is studied. This decision tree represents the participant group's thinking and reasons for their actions. Discrete questions are used to elicit decision criteria and are followed by either 'true' or 'false' answers, by participants, for any particular subject. The decision rules should describe the progressive train of thought of all participants and arrive at an outcome that is true for individual participants and the group. The aim with EDTM is for the decision tree to be predictive of a participant's decision, once decision criteria are known. Thus, if a certain set of criteria is true for a participant, the tree would predict their decision in advance of observing what they actually do (Gladwin 1989).

Through the EDTM process everything participants considered during their decision-making process was identified. We called them the "criteria" participants used and described them in the decision tree as statements.

Following the EDTM process, this research involved three distinct phases:

1. Individual ethnographic interviews
2. Initial model development
3. Model testing and refining

The first phase of the EDTM process consisted of individual ethnographic interviews held with a random sample of 15 WFP participants and 14 non-participants. Participants were identified from a list of farmers provided by Horizons Regional Council. Non-participants were identified using three sources: names provided by the Regional Council, a list of farmer names provided by Federated Farmers, and rural community lists provided by farmers themselves. We used a geographically stratified random sample of farmers.

All interviews were unstructured and conducted on-farm. At the start of each non-participant interview, the interviewee was asked to give his/her views regarding WFP for the researcher to get an understanding of their awareness of WFP. They were then prompted to provide an overview of the decision process they had followed up to the point where they actually decided not to participate. WFP participants were prompted to give an account of all the things they considered since hearing about WFP, up to the point where they made the decision to participate. The researcher occasionally asked questions to get clarity about aspects that were unclear and to elicit and better understand the motivations and constraints that appeared critical to decision-making. Interviewees were viewed and treated as the experts who had good and valid reasons for their decisions. Every interview was audio taped and analysed afterwards to identify the key decision criteria and constraints in the adoption decision process. An individual decision tree was developed for each participant. Then, a staged composite decision-making model was built; it represents the decision-making process of the whole group. In addition to the composite model, a single summarised decision tree, depicting key decision points, was also developed.

During the last stage of the research, the summarized and composite decision tree models were tested and refined with all participants. This was done through a second round of visits to all the interviewees, inviting their input regarding each of the two decision trees. In addition to the

composite model, a single summarised decision tree, depicting the five key decision points for participating in the WFP program, was also developed.

### Findings

Table 1 shows the summarised decision tree. The decision points are phrased as statements with which interviewees either agreed or disagreed. Agreement means the interviewee proceeded to the next statement while disagreement means they decided not to participate, and dropped out of the decision making process. In that manner, interviewees proceeded through the decision making process with some dropping out of the process at different stages of the process.

**Table 1. Key decision criteria for participating in the Whole Farm Plan program**

Key decision criteria	Number of participants who:	
	Agreed and continued with the decision making process	Disagreed and decided not to participate in WFP
1. Soil conservation and water quality are regional issues and also present on my farm	25	4
2. Retiring land on my farm by fencing/tree planting will help solve the issue	19	6
3. The perceived benefits of a WFP are sufficient to encourage me to participate	19	0
4. I trust the Regional Council and its staff; they have farmers' interests in mind	15	4
5. I am willing to invest extra time, effort, and capital into the development and implementation of a WFP for my farm	15	0

The results showed that hill country farmers' WFP decision-making process was based on five key decision points: (1) awareness of and concern for soil conservation and water quality issues across regional and farm scales; (2) the perceived impact of the efforts when addressing these issues; (3) the perceived benefits of using a WFP; (4) perceptions of the Regional Council related to trust; and (5) perceived costs associated with participating in WFP.

### Discussion

The first decision point was acknowledging the problem, at two levels; regional and local. From interviewees' narratives it was evident that previous personal experience of storm related stock and land losses strongly influenced their awareness of the problem as well as the vulnerability of their businesses to extreme climatic events. Their views of the problem varied from issues on their own farms to regional ones that included poor water drinkability, aquatic life deterioration, and waterways losing their aesthetic value. Crisis create motivation; farmers who have previously had bad experiences in terms of natural resource damage during floods and storms were motivated to participate in the WFP program. Four of the 14 interviewees who decided not to adopt WFP, did so at this point in the decision making process; they believed there was neither a regional nor a local problem with soil erosion.

The second decision point was the belief that the solution, i.e. effectively retiring land from grazing by planting trees and/or fencing will successfully address the issue of soil erosion and associated loss of productive land. Interviewees associated land topography, soil types and their proneness to soil erosion, as well as rivers and streams flowing through or bordering their own properties, with the potential positive environmental impacts to be gained if they retired land and/or planted trees. Associated with this belief, was participants' views of whether their farms were developed 'sufficiently', i.e. further fencing and/or tree planting was unnecessary. They also associated additional fencing and tree planting with improved biodiversity and aesthetics. Six of the 14 WFP non-participants, exited at this point of the decision making process, which makes it a critical juncture.

The third decision point was the benefits interviewees believed they would get if they participated in the WFP program. In this regard the cost-sharing of fencing and tree planting as well as technical support were significant motivators for farmers to participate in the WFP program. Research participants associated the benefits of improved biodiversity and aesthetics with improved land values. Table 1 shows that nobody exited at this stage of the decision making process. This means that interviewees believed that they would actually save money while improving land value by participating in WFP. These gains were considered sufficient to continue considering participating in the WFP program.

The fourth decision point was the degree to which research participants trusted the Regional Council. This trust consisted of two parts. Firstly, they believed that if many farmers participated, the Regional Council would make the use of WFP compulsory and they did not want that to happen. They did not want to be told what to do on their own properties and they did not want to provide the authorities with anything that could be used against them. Secondly, participants believed that, as far as farming matters were concerned, Regional Council staff lacked the expertise to run the WFP program successfully because they were viewed as unable to successfully link natural resource management with their farming systems. Four of the 14 WFP non-participants dropped out at this point of the decision making process.

The fifth decision point was research participants' willingness and ability to bear the costs related to participation, i.e. the costs associated with developing and implementing the WFP, which included time, effort, and capital. None of the research participants dropped out at this stage, supposedly because they believed the gains to be had outweighed the costs.

The findings of this research provide useful guidelines for encouraging participation which are summarised in Table 2.

**Table 2. Guidelines for encouraging participation**

Key decision criteria	Guidelines
1. Acknowledge the issue and accept responsibility	Convince farmers that there are problems at regional and local levels and encourage them to take personal responsibility for the effects of erosion on their own farms and across the region. Create a sense of urgency to change and be honest, open and consistent when communicating with farmers. Show farmers the realities and extent of the impacts of hill country erosion at regional and local levels. This will help to generate social support for change.
2. The solution will fix the problem	Provide farmers with the confidence that the solution will fix the problem. Use research findings and success stories of local farmers to demonstrate the success of fencing and tree planting.
3. There are great benefits	When communicating, acknowledge farmers' views that WFP will enhance biodiversity and the aesthetic value of their farms, and link it to the benefits derived from cost sharing and technical support.
4. Build trust	Develop a sincere and genuine understanding of farmers' views and concerns. Move from a contractual relationship to a partnership relationship by sharing the risks associated with erosion; use cost sharing as a leverage point. Be serious in terms of collaborating with farmers in solving the problem. Address staff capability issues perceived by farmers. Involve farmers in decision making at local and regional levels as far as erosion management and control is concerned. Avoid a litigious approach – this is a last resort.
5. There are costs but the benefits outweigh them	Publicly praise and encourage farmers who have invested extra time, effort, and capital into the development and implementation of a WFP. Portray these farms as sustainable businesses.

### Three key lessons

- There were three critical decision points during the decision making process where non-participants deliberately choose not to participate; not acknowledging the problem, believing the solution will not fix the problem, and distrusting the Regional Council
- These points are identifiable doorways for change, i.e. focus on these two beliefs and on building trust when promoting participation in the program
- Trust and collaboration between farmers and local government is important for successful natural resource governance

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