An introduction to the Exploring Futures Platform (EFP)

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Abstract. The Exploring Future Platform (EFP) was developed as a collective learning approach to engaging with a range of stakeholders to explore possible rural futures. In particular the EFP has been designed to help a diverse range of stakeholders: generate group strategic thinking; develop an appreciation of each other's visions and an appreciation of unintended consequences of actions, strategies and policies; identify the steps and actions required to make progress towards a vision for the future of a region; and create an environment for the on-going interaction between participants. In order to improve the EFP two case studies were undertaken in two regions of New Zealand using the process. The stakeholders in each group included local government, landholders and industry representatives. Four workshops were held over two years. A challenge we encountered was integrating participant's experiences and visions for each region with the data on each region presented by scientists. Overcoming this hurdle involved the use of an agent based model to explore 'what-if' scenarios.

Keywords: exploring futures, collective learning, adult learning principles, sustainable development, strategic thinking.

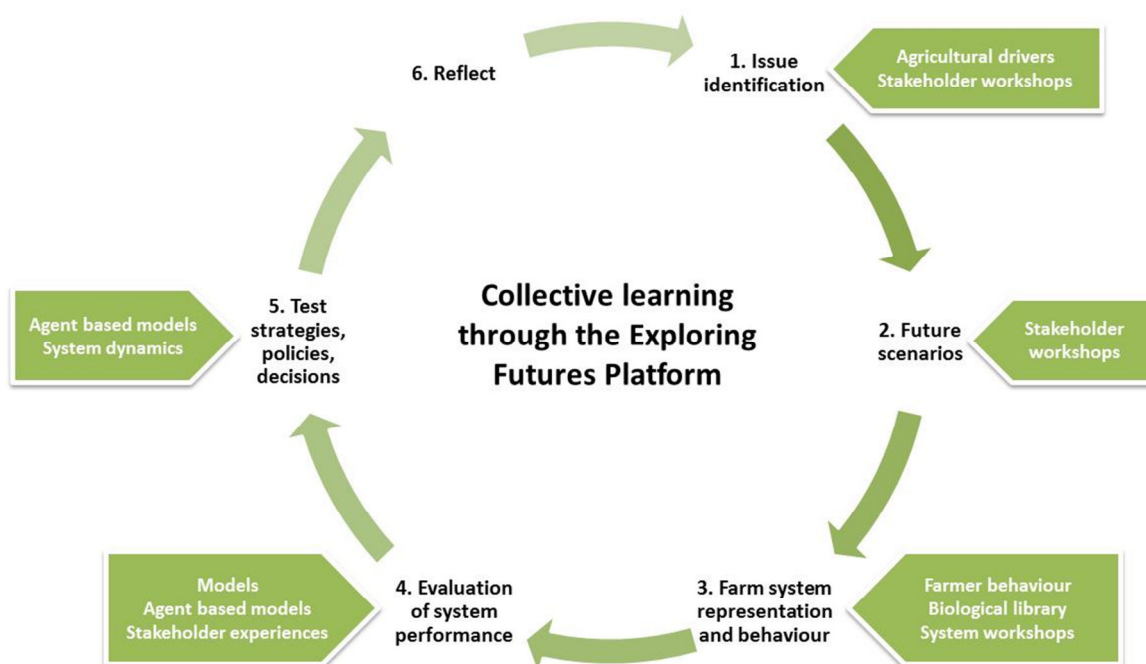## Introduction

Context: The Rural Futures programme

The Rural Futures programme has been a five year New Zealand government funded project to deliver a portfolio of tools, systems and processes to support the New Zealand pastoral industry to adapt and remain sustainable in response to the future pressures they face. The ability to adapt to these pressures, which include constraints on natural resources, emissions to air, through to greater demands around compliance, limits and the need for skilled labour, while continuing to have to lift production and profitability is vital to the continued success of NZ's pastoral industry. In the first part of the project the Exploring Futures Platform (EFP) was developed (Wedderburn et al. 2011). The EFP was designed to help a diverse range of stakeholders understand and explore possible futures for a region.

The Exploring Futures Platform (EFP)

The EFP, outlined in Figure 1, is a collective learning process supported by a range of information sources (research data, participants own experiences) and the Rural Futures Multi-Agent Simulation model (RF-MAS). Collective learning is based on the principles that adult learners are usually self-directed and have a problem-centred orientation to learning rather than a subject matter orientation (Knowles 1980; Mezirow 1997). According to Knowles (1980), the most effective way to deliver these learning principles is through the use of a collective learning model which has the learner and their needs and interests at the centre of the learning process. The Rural Futures collective learning process was designed to meet these principles by putting the learner at the centre of the participatory learner process where they can guide their own learning through asking 'what-if' questions about the future of their own region.

Furthermore, Rogers (1989) argues that the ideal learning environment has a non-threatening, non-judgemental atmosphere in which adults are expected to challenge their own and other's thinking and are also expected to share in the responsibility for their learning. The EFP was designed to provide this learning environment through facilitated discussions amongst small groups, using tools such as the *iceberg* technique, which is based on Maani and Cavana's (2007) four levels of thinking.

The process of the Exploring Futures Platform begins with a group of participants identifying some of the key issues they are grappling with, in the context of sustainable development. This information is then used to develop future scenarios in the second part of the EFP process. In the third part of the EFP process information is used to describe the outcomes of the scenarios developed. These are then evaluated by participants, using both their experiences and with the help of the RF-MAS. Part five involves testing and exploring options for achieving particular outcomes, before the process concludes with some reflection on both the process and the outcomes.

Figure 1. The Exploring Futures Platform (EFP) from the Rural Futures programme.

Others have used similar collective learning/action research type approaches to explore rural futures. Measham et al. (2012) used informed dialogue and qualitative scenarios amongst workshop participants in Apollo Bay in Victoria to explore future options for that region. Scenarios are often developed through stakeholder input and data modelling as a basis for regional discussions (Baker et al. 2004; Berger and Bolte 2004; Frame et al. 2005; Pearson 2010; De Girolamo and Lo Porto 2012; Pfeifer et al. 2012).

The use of scenarios in the Rural Futures project aligns with one particular category of scenario technique – the La Prospective methodology as outlined by Bradfield et al. (2005). A key part of this approach is the reliance on proprietary models and because of this, a reliance on external experts to help carry out analysis and modelling of scenarios. The proprietary model used in the collective learning approach is the RF-MAS.

The RF-MAS

The RF-MAS is a flexible, agent-based modelling framework designed to model New Zealand's dairy, sheep and beef and forestry industries, incorporating inputs from social, economic and biophysical sciences. The model can represent the differences that exist among farmers, their landscapes and farming systems, their responses to interventions and environmental changes, and the resultant consequences for the industry.

An agent-based model is a computer-based representation of a system comprised of multiple, interacting actors called agents (Ferber 1999; Gilbert 2007). Agent-based models have been increasingly used to assist understanding of the interactions in complex coupled human and natural systems. These models have been combined with GIS to produce simulations to help conventional planning and management methods of human and landscape interaction (Parker et al. 2003; Gimblet 2005; Heckbert and Smajgl 2005; Matthews et al. 2007). They can be effectively used as a 'bridge' between quantitative and qualitative data, providing both formal and descriptive representations to illustrate plausible alternative futures that can assist the incorporation of scientific information into decision-making processes for sustainability (Jager and Mosler 2007; van Wyk et al. 2008; Valbuena et al. 2008).

The RF-MAS includes data specifically from each region, including data on land use, on-farm practices, financials and demographics. The model makes projections about farmer behaviour. In particular, it projects farmer decisions about which land-use they might select, what level of intensity they could choose to farm, and what environmental practices they might adopt.

The model has been developed with a web-based interface, which allows researchers to run the model in real time during workshops. Various parameters in the model can be changed in response to feedback from workshop participants, e.g. farmer ages, commodity prices. Running the model in real time allows participants to see immediately the potential impacts of different

assumptions on their local rural community informing the debate and discussion on the possible consequences and unintended consequences of the strategies and farming options considered.
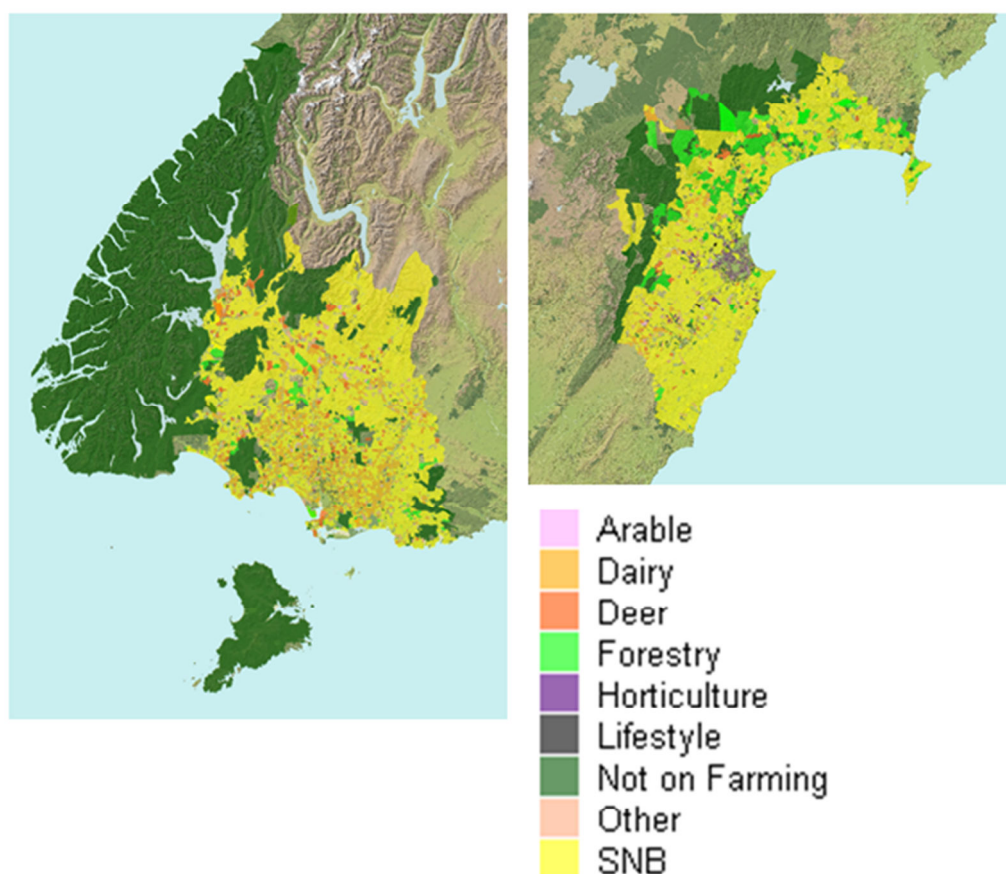
Method

Case study methodology (Yin 2009) was chosen for the task of reviewing the EFP, i.e. providing an opportunity to improve the process. The aim of the review was to determine whether the EFP:

- Helped to generate group strategic thinking.
- Enabled participants to develop an appreciation of each other's visions and an appreciation of unintended consequences of actions, strategies and policies.
- Helped participants identify the steps and actions required to make progress towards a vision for the future of a region.
- Created an environment for on-going interaction between participants.

Two cases studies were selected; one located in Southland (at the bottom of the South Island of New Zealand) and the other in Hawke's Bay (on the east coast of the North Island of New Zealand). These case studies were selected because they provided contrasts; in terms of land use and emerging issues within the regions. The range of land uses in each of these regions is outlined in Figure 2.

Figure 2. Overview of the range of farm types in Southland on the left and Hawke's Bay on the right. Different colours represent the different areas of particular farm systems as per key (note SNB = sheep and beef farming)

Source: The NZ land cover data base and Agribase

Conduct of workshops

Four workshops were held in each region between March 2012 and April 2013, with a range of stakeholders including local government, landholders and industry representatives making up each of the groups. Over the course of four workshops, participants identified five to six critical factors they thought important when considering the future of their region out to 2040. These critical factors were used to evaluate in each case three scenarios presented, highlighting critical areas to address when considering potential futures. The workshop process was as follows:

Workshop 1 Time was spent introducing the project to the participants, and starting to identify and understand some of the issues facing each region through exploring the drivers, factors and relationships that may affect future development in each region. In addition, the RF-MAS was demonstrated to participants.

Workshop 2 The drivers identified from workshop 1 were used to start describing the characteristics of potential future scenarios for land-use 20 to 30 years out; i.e. continuing with current business trends, improvements, no improvements. The aim was to begin outlining scenarios to model in order to explore possible futures.

Workshop 3 The group discussed three scenarios as identified in workshop 2. These differed between the regions. Generally the first scenario was an exploration of how current business trends could continue (a business as usual type scenario). The second scenario explored more an acceleration of agriculture development in the region. The third scenario focused on greater diversification within a region, taking advantage of new crops or integrating enterprises across a region. A comprehensive range of biophysical, economic and social data were presented from Rural Futures programme researchers. The discussion focussed on what was conceivable and implementable, acceptable and not acceptable in each region, along with an indication of the scale of the change and any unintended consequences of each scenario.

Workshop 4 Provided the opportunity to reflect, both on the discussions about different futures, and to discuss any further actions required from the Rural Futures project team. The project team also revisited the RF-MAS to help reflect and to discuss 'what-if' questions that were raised during this process. Each group later received a brief report outlining the workshop process and detailing the information generated over the course of the workshops.

Choice of participants

In Hawke's Bay, the Hawke's Bay Pastoral Group was approached to be part of the piloting of the EFP. The objective of this established group was to enhance sustainable pastoral land management in the Hawke's Bay and the wider East Coast region, with a particular emphasis on the sheep and beef sector. Stakeholders represented in this group were: landholders, Regional Council, Territorial Councils, central government and industry groups. Within this region there are already a number of regional initiatives being explored to address production constraints (i.e. water deficit) in order to sustain growth in the primary sectors.

In Southland, Venture Southland (www.venturesouthland.co.nz) was approached to help identify a range of individuals that could be invited to take part in piloting of the EFP. Venture Southland is a joint initiative of the Invercargill City, Southland District and Gore District Councils. Its purpose is to promote Southland, facilitate economic and community development opportunities and add value to the region. The stakeholders who took part in this case study were representatives of: landholders, industry groups, agricultural consultants, Regional Council and Territorial Councils. Within this region sheep and beef numbers are declining, while dairy is rapidly expanding. This has resulted in an increasing number of new entrants to farming, and a shift in the demographics within the region. One of the major issues in Southland at present is the need to change the Regional Policy Statement to sustain the region's natural resource base. Other issues include the pressure on infrastructure, such as roads and an ageing population base resulting in labour shortages.

One notable exception in both regions from the participant list was a representative from the tourism operators. Tourism is important to New Zealand's economy, as it contributes NZ$6.2 billion to total GDP (Ministry of Business, Innovation and Employment 2013). One Southland tourism operator (jet boats) was invited to be take part in the project, but although initially appearing interested, did not end up participating in the workshops. This could have been a simple matter of priorities (running a business takes priority over taking time out to attend a series of workshops about the future of the region), but suggests that there is a need to clearly articulate what is involved in this process and particularly what participants get from the process.

Evaluation of the process

Throughout the process feedback was elicited from participants, both formally and informally. At the end of each workshop there was a short facilitated session seeking feedback on that workshop. In addition notes were taken on connections made between participants and actions undertaken as a result of the workshops. This descriptive data provided the bulk of the information used to review the EFP process.

Rural Futures (RF) team

The Rural Futures team involved in delivery of each of the workshops comprised the following skills:

- Facilitator (same facilitator for both regions)
- Rural Futures MAS model expert (same expert for both regions)
- Farming systems and resource experts (one in the Hawke's Bay and one in Southland); providing specific information on the context of each region

Behind this team were a range of researchers working to develop farming systems information, and modellers working on the RF-MAS. In Table 1 an overview of the type and number of participants in each case study are provided.

Table 1. An overview of the type and number of participants in each case study

Description	Hawke's Bay	Southland
Facilitator	1	1
RF-MAS expert	1	1
Farming systems expert	1	2
Horticulture industry	1	0
Dairy industry	0	1
Forestry industry	0	1
District Council	1	2
City Council	1	1
Regional Council	2	2
Landholder	2	3
Government	2	0
NGO	0	3
Agribusiness company	0	2
Energy company	0	1
TOTAL	12	20

Results and discussion

The Rural Futures team reviewed the EFP through the course of the workshop process against the four aims stated. Two of the four aims, that participants develop an appreciation of each other's visions and an environment is created for on-going interaction between participants, were achieved. Less progress was made in generating group strategic thinking and as a consequence the groups also struggled in identifying the steps and actions required to make progress towards a vision for the future. Two challenges also emerged, dealing with attendee variation from workshop to workshop, and the need for project team members to be able to deliver relevant, robust data, while remaining impartial and being willing to listen and respond to challenges and questions on that data.

Aim achieved

One of the key successes in both case study regions was the ability of the EFP process to help participants develop an appreciation of each other's visions, an understanding of multiple perspectives, and migrate some way towards a common understanding of an agreed multiple set of drivers of regional change. In a similar way to Measham et al.'s (2012) informed dialogue approach, the EFP provided participants with the space to explore and understand the challenges they face. One of the keys to achieving this was the RF-MAS model. The model enabled the group to explore 'what-if' scenarios in real time. The model had been fully customised for the Southland region, but not for the Hawke's Bay region. Nonetheless, it was clear, both in the Southland workshops and at the last workshop in the Hawke's Bay, that the model enabled participants to explore their understanding of interactions between market prices and land use. The level of engagement as measured by questions, comments and discussion while using the model was very high. The process of exploring outcomes from the model helped the discussion on scenarios and possible futures and appeared to give participants confidence in the RF-MAS model. For example, in the Hawke's Bay one of the scenarios explored was greater integration of the regions resources through co-ordinated sheep production. Discussion on this scenario bought up key questions such as the speed of transition, and whether there was

existing capability in the system to be able to embrace the changes embedded in this scenario. Similarly, in Southland, when discussing one of the future scenarios focussed on diversification, one of the participants commented about the need for a lead agency to drive progress resulting in discussion about current examples and the pros and cons of this approach.

The EFP also provided a way of creating an environment for the on-going interaction between participants and with the Rural Futures team who were running the workshops. The collective learning approach, with the tools used during the workshop processes, provided participants with the confidence to discuss a wide range of issues and make connections both with each other and with the Rural Futures team. Having a farm system expert present at each workshop also meant that some questions on the current state of particular issues (e.g. nitrogen leaching research) could be dealt with as asked and other questions could be followed up to be provided at future workshops as needed. That confidence is also reflected in the invitation from participants in the months following the fourth workshop to the Rural Futures team to continue the dialogue with a wider audience in both regions.

Areas for improvement

Two of the four aims of reviewing the EFP, encouraging participant's strategic thinking and influencing their future behaviour in terms of identifying steps and actions required to make progress towards a vision for the future, were not fully realised in either case studies. There were some practical limitations as to what could be considered as feasible futures in both regions, but it was also difficult to encourage participants to think strategically beyond five to ten years, a time scale that aligns with investment cycles in the primary industry. Recognising this challenge, there may be merit in exploring the value of building a picture of the future in 5-10 year increments. Measham et al. (2012) dealt with this issue by explicitly including evaluation processes into the workshops to help consolidate critical thinking amongst participants. Others have explicitly included a range of social information to help stimulate participants thinking, for example through focus groups, surveys and interviews (Pearson et al. 2010). Within the wider Rural Futures team there has been research undertaken exploring the social aspects of development within a region but utilising that data, whether through the RF-MAS or as part of presenting other data was difficult. Part of improving the process involves working on integrating other parts of the Rural Futures work into the EFP.

Another area for further development of the EFP was to have a greater focus on identifying the next steps and future actions required to make progress towards articulating an agreed vision for the future of a region. In Southland, with hindsight, the mix of participants in the last workshop did not include a great number of the key decision makers or influencers. This meant that it was difficult to identify key actions for participants to pursue. Measham et al. (2012) identified this as a source of frustration, even when key decision makers are involved in the discussion. They recognised that starting a discussion about a region's future is only the first step towards achieving future change. Part of this is the ability to manage participants' expectations. In Hawke's Bay, the cohesiveness of the participants, and their history of grappling with large regional challenges, combined with the EFP process, enabled the Rural Futures team to manage most of the explicit expectations of the group. In Southland, managing expectations proved more difficult. Marshall (2008) notes that regionally based planning efforts are most successful when led by community, rather than by people coming in from outside.

Challenges

Variation in participant attendance In both regions there was variation in the attendance patterns of participants from workshop to workshop. In Hawke's Bay attendance was low for three of the four workshops. Several key participants were unable to attend all workshops; mostly it seemed because of clashes with the date of a particular workshop. To some extent, this is unavoidable, as long as all reasonable efforts are made to check dates with participants for other commitments that would prevent them from attending. In the Hawke's Bay this was relatively easy to do as the group had been used to working out dates and times to meet. However, when all participants were there (e.g. at the last workshop), there was a high level of engagement and focus suggesting a high level of social capital within the group (Woodhouse 2006). This is not surprising given that the group had been formed before their participation in the EFP and therefore already knew each other well. Measham et al. (2012) highlight the importance of considering two forms of social capital; bonding – interaction that develops within groups, and bridging – interactions that develop social cohesion between groups. The Hawke's Bay group appeared to have a high level of both bonding and bridging providing an excellent base for discussions on regional futures using the EFP. This appears to have compensated for the low level of attendance, which was frustrating at times for the Rural Futures team. The Hawke's Bay group was also able to develop a specific set of actions at the end of the workshop

process to take the thinking and information developed from being involved in the EFP further out into the world.

In Southland most of the participants in the workshops did not have a history of working together. Given the nature of the region (i.e. relatively small) most of the participants knew each other, and were quite comfortable sharing different perspectives and views. There was initial enthusiasm and engagement from the workshop participants. However, over the course of a year and the four workshops, this initial enthusiasm faded. Although there continued to be a high level of engagement amongst those who did participate, several key decision makers or influencers of decision makers did not attend the third and fourth workshops. This meant that at the last workshop it was harder to identify any specific actions as a result of use of the EFP with this group; one of the initial aims of reviewing the EFP.

It appears that both the quality and quantity of social interactions are important (Faulk and Kilpatrick 2000; Measham et al. 2012). Woodhouse (2006) suggested and provided evidence for a link between high social cohesiveness within a region and the economic development of that region; i.e. the more connected people are, the more likely they are to be able to see and make the most of opportunities for their region. In both case studies, participants were well aware of the need for economic development to sustain community and protect futures. In Southland the rapid expansion of the dairy industry is raising concerns about the environment, placing pressure on infrastructure and has resulted in significant changes in the fabric of rural communities. The growing dependence and exposure of the Southland region to one sector was another concern expressed by some participants. Others did not see this as a concern, but rather the basis for a more sustainable future, notwithstanding the concerns noted above with land use change to dairy. The absence of several key decision makers or influencers of decision makers in the Southland group meant that the conversation by those that attended workshop 3 and 4 was constrained, making it difficult to advance the debate on what a future economy might look like. In contrast to the immediacy of some of the challenges in Southland, the Hawke's Bay group had the luxury of time and space for discussion on futures.

In addition, Measham et al. (2006) noted there are natural regional limitations. In their case the competitive advantage of the region (picturesque, located within a few hours drive from a capital city) immediately ruled out some potential future scenarios (e.g. wind farming). In this regard the two case studies offered some interesting similarities and contrasts. Both recognise they have finite natural resources. The Hawke's Bay region has more land use options because of its climate. Southland's location as the southernmost region of the South Island of New Zealand means this region struggles with retention of young people and in attracting professionals and their families into the region from other parts of the country. Hawke's Bay is seen as an attractive place to work, holiday and retire. Advancing the merits of diversification within a region, while discussed by both groups, carried more interest with the Hawke's Bay group.

Conclusion

The Exploring Future Platform (EFP) was developed as a collective learning approach to engaging with a range of stakeholders to explore possible rural futures. To review the EFP process two case studies were undertaken in two regions of New Zealand, Hawke's Bay and Southland. The EFP successfully helped participants in each case study develop an appreciation of each other's visions, an understanding of multiple perspectives, and move towards a common understanding of the multiple drivers of regional change. In addition the EFP created an environment for the on-going interaction between participants and the Rural Futures team.

A challenge we encountered was integrating participant's experiences and visions for each region, with the data on each region presented by scientists. Overcoming this hurdle involved the use of an agent based model to explore 'what-if' scenarios as well as acknowledging the practical regional limitations in terms of land use. In addition, managing the expectations of participants was critical. This was more successful with an established and cohesive group in the Hawke's Bay compared with the Southland case study.

Acknowledgements

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