FOCUS – FARM PLANS, OUTCOMES, CATCHMENT PRIORITIES AND USERS

Lucy McKergow[1], Tony Faulkner[2], Andrew Stewart[2], Richard Parkes[2], Scott Ihaka[2], Sandy Elliott[1], Alec Mackay[3], Mike Freeman[4] and Bob Longhurst[5]

[1] NIWA, PO Box 11115, Hamilton 3251
[2] Greater Wellington Regional Council, PO Box 41, Masterton 5840
[3] AgResearch Grasslands, Private Bag 11008, Palmerston North 4442
[4] AgResearch Lincoln, Private Bag 4749, Christchurch 8140
[5] AgResearch Hamilton, Private Bag 3123, Hamilton 3240
email: lucy.mckergow@niwa.co.nz

Abstract

Regional council land management officers (LMOs) have a unique role in building relationships between regional councils and landowners, and linking farm activities to catchment water quality outcomes. FOCUS has been developed with the Greater Wellington Regional Council to develop and formalise the links between catchment and farm planning. Our goals were to identify water quality 'hotspots', help farmers develop customised solutions for their properties, assess catchment outcomes and track change. FOCUS starts with the question – "Is there is a water quality issue?" - before work on the four main modules begins. The **Catchment** module allows rapid creation of a knowledge bank, exploration of local resources and assists in identifying the role farm plans might play in the catchment, and where to roll out farm planning first. The **Farm** module is based around a customised Farm Action Plan, with the farmer in the driver's seat and the LMO as a guide. The **Farm Action Plan** is developed on farm in a simple spread-sheet format and contains basic farm information, reviews previous farm planning, documents the farmer's view of catchment water quality and links between farming and water quality, explores what is already working on the farm and identifies small steps that can be taken immediately. In the real world, change lurks around every corner, so the action plans need to be regarded as work in progress with the capacity to be reviewed and updated as and when required. **User training** is a key component of FOCUS and is designed to ensure LMOs have an understanding of how to use and customise FOCUS, identify training needs, and provide an introduction to progress-focused conversations. Activities, outputs and **outcomes** are tracked in FOCUS, including documenting changes in farmer awareness and progress on the ground. FOCUS is presented as a VUE content map (available to download on http://www.envirolink.govt.nz/Envirolink-tools/) and our hope is that this prototype will be customised by users and continue to evolve as new tools are developed.

Introduction

Use of whole farm planning as a tool to achieve sustainable land use practices has a long history in New Zealand and particularly in the Greater Wellington region, with the first plan being prepared in the 1950s. The objective of these plans was minimising soil erosion on hill country properties in the eastern Wairarapa. Gross sediment erosion is visible on the land and downstream in rivers as turbid water. When the consequences of poor land management is obvious, engaging farmers is a reasonably straightforward task. More recently, however, the target of catchment management plans has widened to include nutrient and faecal contamination of waterways, which are generally not visible. Farm planning has therefore

slowly grown to include a greater diversity of land uses and has been extended to address a wider range of water quality issues (including nutrient and faecal contamination).

Individual catchments have unique characteristics as a consequence of the interaction of multiple variables, including land-use, soil types, climate and hydrology. FOCUS was developed with Greater Wellington Regional Council (GWRC) to formalise the links between catchment and farm planning and ensure that regional council and landowner funds are spent on appropriate and effective mitigation options. Our framework is called FOCUS because it is an acronym for the main modules **F**arm plans, **O**utcomes, **C**atchment priorities and **US**er Training; its purpose is to focus attention on areas of catchments and farms; and it uses Solution Focused approaches.

FOCUS makes use of several Solution-Focused approaches as aids for decision making and amplifying change. Helping farmers find solutions to environmental issues is about *change* (supported by science and economics). Most approaches aimed at affecting change seek to discover what to do next by examining the problem (a problem-centred approach) and then seeking ways to address it. This works well for relatively simple systems such as faulty cars or washing machines, where there is a clear link between the problem (the spin cycle does not work) and the solution (replace the circuit board). It is far less effective for complex systems that involve people and natural systems, where "solution-focused approaches" are more useful. We use components of three solution-focused approaches – "Structured Decision Making" (Gregory et al. 2012), "Solutions Focus Risk Assessment" (Finkel 2011) and "Solutions Focus" (Jackson and McKergow 2007, Jackson and Waldman 2010). These approaches focus on making decisions (either large or small/experimental), are iterative, explore what matters, value creativity, and do not presuppose that a single "right answer" exists. By travelling a different route to the problem-centred approach, we deliver an efficient framework for LMOs, and a mechanism for engaging farmers in the process leading to customised solutions. FOCUS builds on the long history of farm planning and is a framework for LMOs to prioritise and identify water quality 'hotspots', help farmers develop customised solutions to improve water quality, assess potential and actual catchment outcomes and track change. FOCUS is a flexible, simple framework that comprises four modules. It makes use of available tools, models, data, plans, and databases. FOCUS starts with the question – "Is there is a water quality issue?" - before work on the four main modules begins. This paper provides a short overview of the 15 main tasks.

During the project the need for a user-friendly, visual product emerged along with a desire to have a living tool which could be edited, updated and customised. FOCUS is not a linear or cyclic process – it is a web of interwoven tasks with different time frames for development and review. FOCUS is presented as a VUE (Visual Understanding Environment) content map – nodes with attached documents or web links. A LMO works individually on the **Catchment**, **Outcomes** and **User training** modules (drawing on other regional council staff as required), and works with the farm decision maker(s) on the **Farm** module. In most catchments the **Catchment** and **Outcomes** modules would be completed prior to the **Farm** module, **Farm outcomes** and **Catchment modelling** tasks. In addition, new users may take different routes to those followed by experienced users. Users might work on several tasks simultaneously, so we present the main tasks in the format of a camera focus frame (Figure 1) and the starting point is the central focus point. Many supporting documents are contained in the VUE package (including FOCUS User Guides, a review of mitigation tools, journal papers and abstracts, web links, etc.) and it is available on the Envirolink website (http://www.envirolink.govt.nz/Envirolink-tools/).

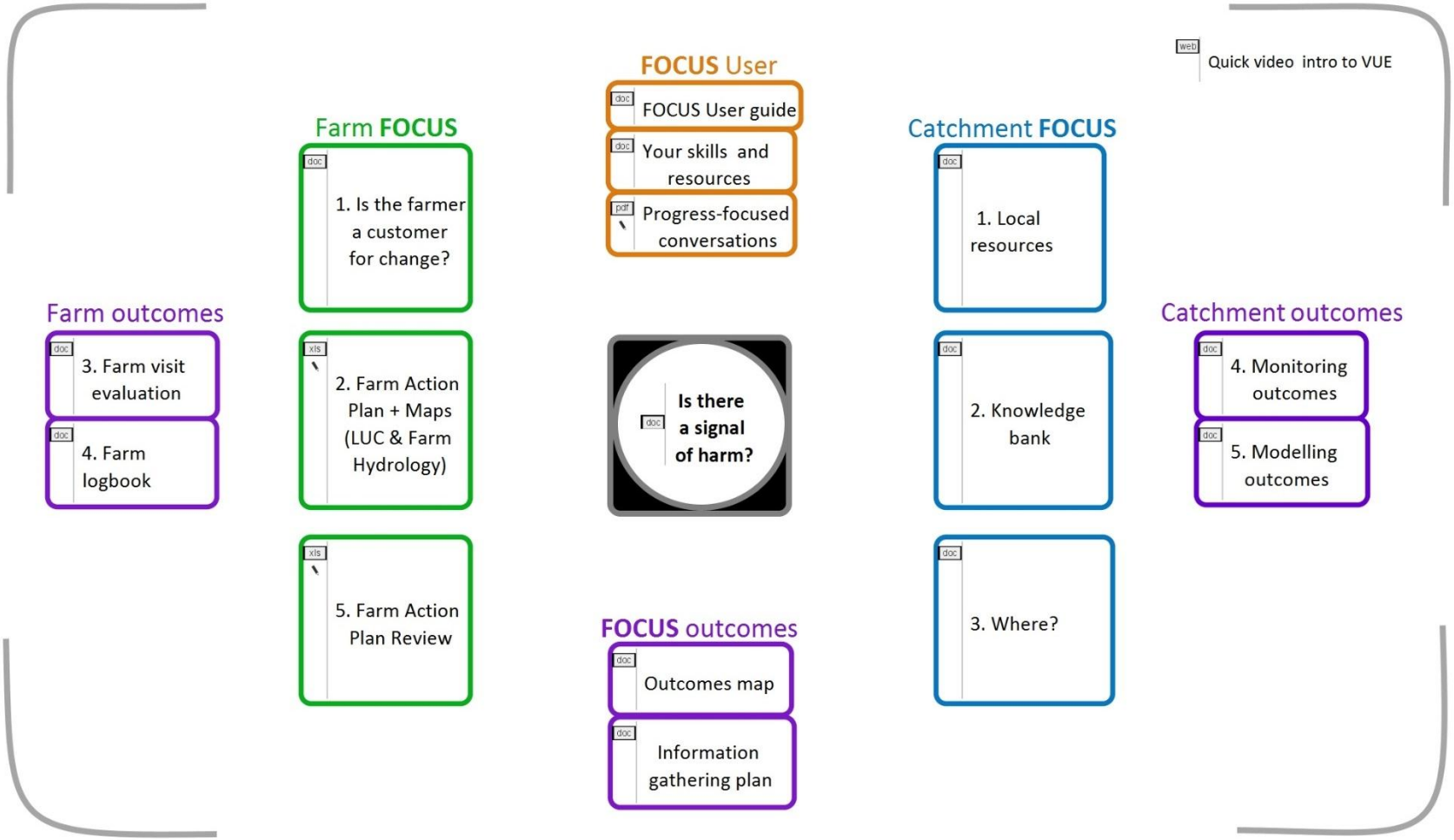

Figure 1. FOCUS main frame in VUE. The main starting point is the central focus point. Farm-related module tasks are on the left, catchment-related tasks on the right and outcomes are distributed. All nodes are colour coded (Farm = green, Outcomes = purple, Catchment = blue, User Training = orange).

Signal of harm

FOCUS starts by identifying 'signals of harm', i.e., a water quality issue where there is clear evidence that water quality does not meet the purposes required by the community. If no 'signal of harm' exists, then there is no need to go further, unless the land owners wish to better understand the current impact of their enterprise on water quality. The signal of harm provides the boundaries for what is to follow – definition of the contaminant(s) and the impact on the waterbodies (river, lake, groundwater, etc.) that are adversely affected. The signal of harm might also be used to evaluate progress toward water quality targets. Once the catchment outcomes tasks are achieved, the evidence for the signal of harm is reviewed. Gaps in the signal of harm evidence may also provide justification for additional monitoring. Despite gaps, decisions can still be made and steps taken to improve catchment water quality.

Understanding what comprises an acceptable or unacceptable water quality outcome is therefore critical. Deriving water quality values is outside the scope of this tool. Some communities will have been through a water quality values project recently (e.g., Wheel of Water, Zone Implementation Plan process, RIVaS, etc.,) and these are a valuable resource for the FOCUS process. In other situations, the community consultation processes used to develop regional plans should provide insights into the water quality outcomes desired by the community.

USer FOCUS

There are three main components in the training package: i) a training workshop, ii) progress-focused conversation training, and iii) a skills questionnaire. The tool training workshop covers all aspects of the tool – what it is, how to use it, when to engage in the different tasks. All tool training is hands-on, working through a case study catchment.

An introduction to progress-focused conversations, their potential in farm planning (McKergow and Faulkner, 2014) and basic training exercises are provided in the USer module. This style of constructive conversation is simple to learn, respectful and motivating. It can be learned and practiced in a two day course with some follow up sessions.

Although farmers seek and are offered advice by many experts or consultants, a LMO plays a unique role in linking farm activities to catchment water quality. **Your skills and resources** helps a LMO consider how they can best assist farmers in a particular catchment. For example, a LMO might need to deal with faecal contaminant issues for the first time, and may wish to explore and broaden their understanding of the issue before engaging with landowners.

Catchment FOCUS

There are three main tasks in the catchment module: i) creation of a knowledge bank and concept map, ii) exploring local resources and iii) identifying "where?", i.e., where should intervention be prioritised? These tasks are undertaken by the LMO, with support from others as necessary.

Local resources is a questionnaire prompting a LMO to identify and reflect on the resources that are available to support them - other regional council staff, local community group members, farmers, DairyNZ consultants, agricultural sector discussion groups, agricultural consultants, BMP demonstration sites, existing land care groups, etc. Identifying and tapping

into the undocumented local resources is an important initial task when beginning a catchment intervention process.

The **Knowledge Bank** is a series of questions designed to help pull available information together over a timeframe of days rather than months. It includes thinking about what's going well in the catchment, and identifying solutions likely to be suitable for this catchment. This leads to recognising and valuing what is already good or effective, rather than focusing on the problems. A mitigation pyramid is developed for the catchment as both a learning and teaching tool. At the pyramid's base are methods for building soil health and controlling contaminant generation, followed by methods to control water in and below paddocks and lastly riparian management. The final step is development of a concept map or knowledge network that links values, processes and mitigation tools in a manner that captures the complexity of the catchment. It is included as a learning and teaching tool in the form of a document that evolves over time as new information becomes available. As a learning tool, it helps to untangle thoughts and allows the LMO to understand complex processes and interactions; as a teaching tool, it assists a LMO to communicate understanding of these complex processes and concepts to others.

Where? answers the question "*where in the catchment should I take a closer look*?" This task explores how each farm might be contributing to the status of existing catchment water quality. The aim is not to classify parts of the catchment as "good" or "bad", but to decide whether any given area or farm is worthy of further investigation. Each contaminant is considered separately, rather than trading-off between contaminants. The task brings together evidence from the concept map, monitoring data, information derived from a Geographic Information System (GIS) and models, to identify farms in the catchment where closer examination is warranted. This process aims to provide sufficient information to complete the task without overcomplicating it by including too many models or variables. Procedures and interactions with models have been designed so that the GIS remains a useful tool, and the information can be extracted as efficiently as possible. Each Evidence Source has a short (1-2 page) FOCUS User Guide and links to supporting material are included in the VUE package.

As a consequence of using many different data sources, some strands of evidence may lead to conclusions that are inconsistent with others. So there is a requirement to incorporate a specific step that includes assessment and objective evaluation of the evidence. The final product is a list of farms where more detailed investigation should take place.

FOCUS includes and makes use of multiple types of evidence e.g. observational, monitoring, experimental, model output - guidance is provided on how information derived from various sources should be integrated, compared and evaluated. A specific task has been developed to facilitate rapid assessment of the evidence for each farm. The basic hypothesis for this task is 'runoff/drainage leaving this farm does not impact water quality for X use downstream' (the identified uses come from the Knowledge Bank task).

The evidence assessment task principles are:

1. All relevant knowledge must be included, regardless of source
2. An open exploration of the quality of data with full documentation
3. An assessment of data quality - relevance, reliability and sufficiency for this catchment.

The three basic criteria used to assess the evidence are - relevance, reliability and sufficiency. The relevance of the output is examined by clarifying how it affects the decision, for example, *Does it help to distinguish between farms*? For example, if N leaching loss is HIGH throughout a catchment, it will be a poor discriminator for prioritising (but indicates that N mitigation might be required on all farms). Reliability of the information is assessed by asking, *What are the inconsistencies?* and then, *Is each evidence source suitable?* The question of sufficiency includes *What are the consequences of being wrong?*

Farm plan FOCUS

Ownership of the process to improve water quality by the farmer puts the farmer in the driver's seat, with the LMO as the co-driver or navigator. The underlying philosophy of this module is to help farmers collate what they know about the situation and create some meaningful actions. Farmers are a highly diverse group with different resources and exposures to risk; production needs, tenure arrangements and ownership goals; environmental motives; personalities; tendencies regarding engagement with programmes; and social networks (Reimer et al., 2014). Recognition of a water quality issue across a community and a commitment by all to do something about it are necessary for change to occur. Progress-focused, constructive conversations provide the motivation leading to action and subsequent improvement in water quality.

The initial task in the Farm module is to ask **Is the farmer a customer for change?** In initial conversations LMOs will need to assess whether a farm decision maker is receptive and willing to explore and to enhance understanding of the impact that their farm system may have on water quality. Some land owners may have little interest in understanding the impact their business has on water quality or learning more about land use-water quality relationships. The interest from the farmer will determine the approach the LMO takes. For example, the conversations and resources used by LMOs with farmers who approach GWRC for farm plans will be very different from the approach used with land owners who see little merit in formal land use evaluation and planning. In the latter case, the LMO would need to focus on relationship-building before proposing farm planning.

The proposed Farm Environment Plan has two key components: a spreadsheet file of the **Farm Action Plan** (FAP) and **Maps** (MAP; such as Land Use Capability, Farm Hydrology, annotated aerial photographs, etc.). It is also anticipated that any previous farm planning and OVERSEER® nutrient budgets (Overseer) will be built into the plan to avoid replicating previous work. Additional tools, such as visual soil assessment, DairyNZ Farm Enviro Walk, and the Beef+Lamb LEP Tool Kit, might also be appended.

In FOCUS the time frame for **Farm Action Plan Reviews** is customised. Currently at GWRC, Farm Environment Plans are formulated as annual plans. However, more frequent FAP reviews might result in additional actions and also enable change to be identified and documented. The FAP review could be completed as a short, structured telephone conversation on a mutually agreed time frame depending on the rate of change and need for support. For example, a farmer might want a review in 3 months and then move to six-monthly conversations. Short reviews might also be undertaken opportunistically when a farmer contacts an LMO.

The **FAP+MAP** are developed on farm in a simple spreadsheet format. This style suits LMOs because it is completed on the spot without requirement for additional editing or write up. The Farm Action Plan has three components:

1. collating basic farm information and reviewing previous farm planning,
2. establishing the farmer's understanding of how the farm fits into the catchment by asking open questions, and
3. conducting a progress-focused conversation on issues the farmer identifies as important and wants to do something about.

The **Basic details** starts with an overview of the farm system and includes review of previous planning or data. Establishing the soils, farm type, land management policies, farm performance and the farmer's personal and business goals, the current and potential future opportunities and associated constraints and risks to the business are key first steps in advancing any conversation by LMOs. This ensures a holistic approach to advancing sustainable land management. During this conversation the LMO might ask about previous farm planning and identify potential tools (or parts of tools) that were a good fit (e.g., visual soil assessment, a farm hydrology tool, DairyNZ Farm Enviro Walk, and the Beef+Lamb LEP Tool Kit). The LMOs will also have a local "library" of relevant Overseer mitigation scenarios to share with farmers.

Placing the farm within the wider **catchment context** includes using catchment maps and asking open questions as next important steps. The conversation will help both the land owner and LMO quickly establish the influence that the farm could be having on current catchment water quality. If a farmer expresses the view that faecal contamination of surface water is the main issue facing farming in the catchment, the LMO can use this interest to initiate a conversation that explores the linkage between farming practice and catchment water quality outcomes. While the processes leading to faecal contamination within this catchment may not necessarily be relevant to nitrogen, phosphorus or sediment water quality issues, the conversation will create the opportunity to talk more broadly about the relationship between on-farm decision making and wider catchment water quality outcomes.

Once an issue has been identified, a **progress-focused conversation** is used to complete the Farm Action Plan on issues that the farmer has identified and **wants to change** AND **is willing to take personal action.** Each issue might also be given a project name by the farmer, helping to clearly identify and document or "cement in" what is wanted – this will also maintain farmer ownership of the solution-building process.

The progress-focused conversation uses simple questions such as *what's wanted? what's working?* and *what's next?* to explore develop customised solutions. The building blocks for change are much more likely to come from activities that are already leading to positive water quality outcomes. During this conversation, the LMO is looking for historical and current examples of success. These simple questions are embedded in the new FAP template, along with questions that will ensure that the benefits arising from implementing the FAP and positive changes are recognised. *What's working?* is used to build a foundation (there is no need to start from scratch), identify resources and skills and identify what is currently resulting in good water quality. This will help maintain the status quo – it is easier (and of course preferable) to maintain existing good quality water than it is to restore it.

The progress-focused conversation is based on the successful OSKAR coaching model (Jackson and McKergow 2007), which provides a series of steps for structuring Solution Talk. OSKAR is an acronym for Outcome, Scaling, Know-how, Affirm and action and Review. It is a flexible and versatile framework, so not every element needs to be used every time. OSKAR can be used for both face-to-face and telephone conversations.

Use of examples from neighbours or local leaders can also be very useful in enabling change. If the LMO does have technical expertise that it would be beneficial to share, the know-how is best shared as a *possibility* rather than *the remedy*. Real-life experiences are a solid method for sharing know-how, once permission has been granted (e.g., *Are you interested in hearing how Joe down the road went about this?)*. With agreement from the farmer, it is useful to share the experience, allowing the farmer to extract helpful elements themselves.

For example, in a progress-focused conversation regarding farm dairy effluent (FDE) application where the options chosen by the farmer are inadequate 60% of the time for various (but identifiable) reasons, the LMO can focus on the times when the system performs well, as a process for lifting performance. This approach is motivating because it focuses on success – those things likely to lead to a good solution. After implementing small changes identified by the farmer (such as staff training or adopting low rate application technology), the period during which land application of FDE is not consistent with water quality outcomes may be reduced to say 10% with minimal effort.

The FAP also includes questions that prompt the farmer to notice change. A simple series of open questions can be used to encourage a farmer to establish a simple monitoring programme that will enable them to detect and quantify change. This will help ensure that the farmer remains motivated and continues to notice change. For example, a simple programme to monitor change in stream bed condition after fencing cows out of a stream channel might involve photographing the stream using a smart phone placed on an angle bracket on a fencepost on the first day of each month after lunch, then pinning a printed photo on the office wall to create a record that is likely to demonstrate change over a period of months.

Use of simple, easily understood language that echoes that used by the farmer is at the heart of this approach. Confusion, misunderstanding and rejection of the information is more likely when technical language, jargon or 'policy-speak' is used. Using the farmer's descriptions of what they want and what is already working demonstrates that the LMO is listening and understands the issues facing farmers.

Three other tasks were developed to accompany the FAP when appropriate:

1. **Join the dots** is a simple tabular analysis of the existing processes, alternative processes/solutions, leading to detection of change. It is designed to be completed for one contaminant at a time, and is intended to be a learning and creative decision making tool.

2. **Consequence analysis** is used for more important decisions which may involve considerable capital outlay, such as implementing an alternative farm dairy effluent system. A consequence table or matrix is developed that relates solutions to criteria and applies a score or value. This moves beyond the simple pros and cons style of analysis that is often presented to farmers. The latter may be inconsistent, contain gaps, have vague descriptions, include value judgements, confuse means (how?) and ends (why?), and include double

counting (Gregory et al., 2012). A structured consequences table provides the basis for open dialogue about trade-offs. When required, scenarios and optimisation can be used to inform consequence analysis. Where this is outside of the LMO's role/expertise, the LMO will be able to suggest a suitable agricultural consultant to a farmer.

3. **FOCUS User Guide for Overseer** highlights some Overseer key modelling assumptions and potential opportunities to mitigate nitrogen and phosphorus losses to water. The guide explores relevant individual farm opportunities to reduce nutrient losses to water to meet catchment water quality objectives and at the same time consider the implications for the farm business.

FOCUS Outcomes

The LMOs identified the need to track progress. In order to evaluate progress toward water quality objectives and to measure the success of a tool, planning is required to ensure that necessary data are collected. The tasks are designed to understand the gap between 'what's there now' and 'what's wanted' and clarify the likely causes of changes made to date and changes likely to occur in the future. FOCUS outcome evaluation includes tracking changes in land management, farmer engagement and water quality outcomes. Outcome Map and information gathering plan templates are included in FOCUS. They can be customised to local catchments.

In the **Farm Module** there are two outcome focused tasks:

1. **Farm visit evaluation** utilises a short questionnaire designed to be completed immediately after the farm meeting.

2. **Farm logbook** is designed to maintain a record of interactions with the farmer as well as progress on the ground.

The **Catchment Module** incorporates two outcome tasks - catchment outcomes modelling and monitoring.

1. **Outcome modelling** might be achieved using a simple spreadsheet model (Catchment calculator currently under development at NIWA), which uses the farm as the base unit, and/or CLUES scenario modelling. Local and current farm information can be entered into either model along with mitigation actions. Greater Wellington Regional Council staff have had basic CLUES training to support this task. This task is supported by a **Scenario Design** task.

2. Guidance on **catchment scale water quality monitoring** is provided. Guidance is provided on designing monitoring to match the target audience. Evaluating the effectiveness of catchment scale good management practice is difficult (see Meals et al., 2010). We cannot afford to extensively evaluate every farm or sub-catchment with the level of rigour that might be desired – this makes it imperative that the monitoring is able to demonstrate that management actions are achieving the water quality outcomes anticipated.

FOCUS Outcomes also has two principal outputs:

1. An **Outcomes Map** built around the concept of the 'splash and ripple' associated with dropping a rock in a pond. The act of dropping the rock is like an ACTIVITY. When

the rock reaches the water, it creates a SPLASH, which are the outputs. The RIPPLES, spreading out from the splash are the outcomes (immediate, intermediate and longer term). So for example, if an activity is development of a FAP+MAP package, the output is the completed FAP+MAP, and the immediate outcome is the farmer undertaking action (e.g., modifying a FDE system). Longer term outcomes will include improved catchment water quality.

2. An **Information gathering plan** enables collection of information as work is done, which is subsequently used to evaluate the tool and track progress by the group within a one year period. So following the example above, implementation of the originally agreed actions (plus any additional or modified actions) needs to be tracked by the LMO and the farmer. These are recorded in the FAP along with any review; after a period of six months the LMO can assess progress. Both immediate and intermediate outcomes have an information gathering plan.

Conclusion

Albert Einstein once commented that "*Things should be made as simple as possible - but no simpler".* Anyone can simplify something by leaving things out - the challenge is to simplify whilst ensuring the process remains effective. We have reflected on what was wanted, what was already working and how to change it to encourage action on the ground that will make a difference to catchment water quality AND how to track and document social and physical change. By adopting Solutions Focused approaches we have delivered tasks for LMOs to rapidly build knowledge about a catchment and engage farmers to build positive change. FOCUS is a template for users to customise. Our aim is for FOCUS to be a simple, living framework that can be refined to suit the specific circumstances of each catchment and its communities.

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