WaterMARKE
Mitigating Agricultural Impacts through Research and Knowledge Exchange

WaterMARKE
Research & Knowledge Exchange

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ASSAP Farming for Water Quality
Agricultural Sustainability Support and Advisory Programme – ASSAP

Water: Mitigating Agricultural Impacts through Research and Knowledge Exchange

WaterMARKE project co-funded by EPA and DAFM

Project team: Biophysical scientists, economists, behavioural psychologists, ASSAP, LAWPRO, NRN

Acknowledgements:

Thanks to ASSAP advisers for cooperating with the studies.

Thanks to all the farmers and advisers who kindly consented to be interviewed by the behavioural psychologists.

A special mention goes to all those who collect, clean, manage and constantly develop and improve the ASSAP database, making it a really valuable research resource.

Farm scale risk assessment

- The biophysical research team: (Karen Daly, Owen Fenton, Thomas Moloney) undertook a farm scale risk assessment that categorises drainage ditches in relation to P loss risk, based on connectivity and physico-chemical characteristics.

- Drainage networks on 10 pilot farms were characterised through ground survey, sediment and water sampling , ranking ditches from 1 to 5 (low – high) in relation to the magnitude of connectivity in transferring point and diffuse P sources to nearby surface waters, base on landscape position.

- Putting the findings into practice, the research team devised training for ASSAP advisers in relation to the incorporation of the drainage ditch (1 – 5) assessment classification into the ASSAP water quality mitigation farm plans.

Why look at Behaviour?

Water Quality is COMPLEX

- biological mechanisms of loss of nutrients/sediment & nutrient source management

CONTEXT……. Soils, geology, slope, elevation, organic matter, N surplus, P index, Connectivity to water

MULTIPLE MITIGATION MEASURES….. risk, location, farm system, farmer behaviour

Behavioural studies provide information on

- drivers of human behaviour
- design of incentives and interventions to achieve greater adoption of new/different farm practices

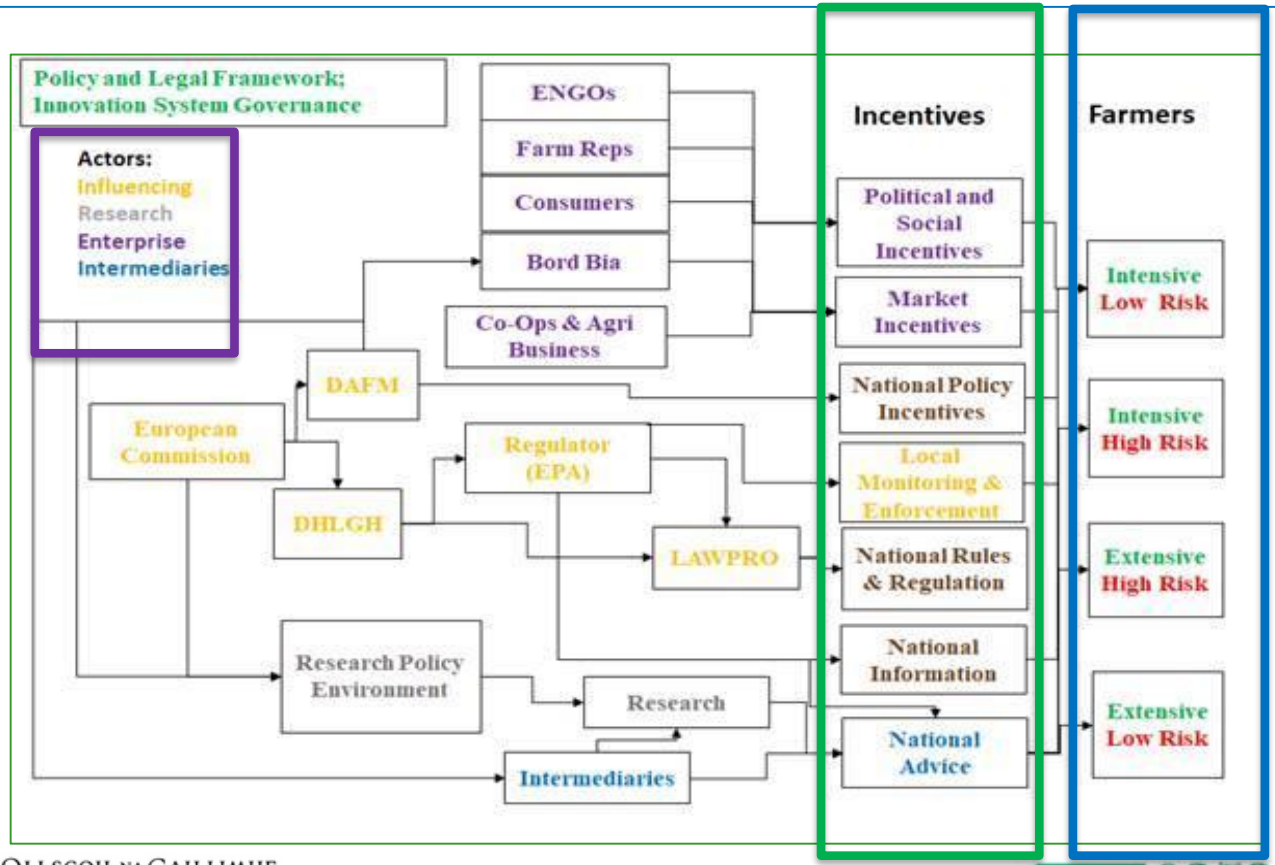
…behaviour is often common sense…. but not always common in practice…

The Challenge of Improving Water Quality

Need to look at the 'System'

WaterMARKE Expert Panel Meeting July 2018, NUI Galway, facilitated by Prof D Pannell, Australia: (DAFM, DHLGH, LAWPRO, ASSAP, Teagasc, EPA, scientists, economists, psychologists, data analyst, adviser, community officer)

- Different farmers behave differently
- Different farmers respond to different incentives
- 7 Dimensions to influencing behaviour
- Actors who influence behavioural drivers
- *Interaction between actors?*



Learnings:
.."*complexity"…"localised advice"…*
"…not just about changing farmers' behaviours"…

Actors had never all met together!

National Survey of Farmer Behavioural Drivers

5 measures: soil testing, NMP, avoid spreading-high risk areas, lime application, fence watercourses

Individual farmers' intentions to adopt measures are influenced by:

- their **attitudes** about the measures
- their **knowledge** of measure/perception of their ability to implement measure
- how they are influenced by other farmers' **norms** in relation to measures
- **cost** of measure implementation on their farm.

Positive? Negative?

Lots of knowledge needed?

What will others think?

Upfront? Time? Hassle? Training?

Learnings:

- **farmer norms** and **knowledge** are consistently strongest drivers of intention to adopt measures, followed by cost
  - **Potential of group and peer learning?….**
  - **Reinforce +ve and counter –ve norms**
- Finding also applies to **adopting a bundle of measures**
  - **Potential to EXPLICITLY promote bundles of measures with multiple benefits?**
    - » **Water, ghg, biodiversity, climate change adaptation, flood prevention…..**

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ASSAP Study: Complexity of prescribing appropriate measures…

ASSAP data combines **44 issues** and **90 specific measures**

-> over 300 issue-related measures prescribed

- A: Analysed data looking for patterns that could be used to reduce complexity…. but not possible….
  - too many different risks and farm contexts….
- B: Created different ASSAP measure descriptions for implementation in different areas
  - issues/risks

Learnings:

- Complexity highlights the **need for the ASSAP one-to-one approach**
- Use individual measures descriptions to create a 'training manual' for new ASSAP advisers
- Potential tool for scaling-up ASSAP experiences for mainstream advisers?

ASSAP Statistics: 5.1 measures/farm (on average)

Main Issues:

- 1: Need for buffer-strips near water-courses/abstraction points (recommended on 1400 farms
- 2: P loss through overland flow top issue on cattle/sheep farms (sloped, organic, high rainfall)
- 3: Fencing watercourses/siting drinking supply away from watercourses

Engagement

- varies by system from 72% for tillage to 93% for dairy
- farms with point source more likely to undertake measures
- large farm size & agri-environmental scheme participation more likely..
- more measures prescribed -> greater adoption

Learnings:

- Easy wins: **Useful info for both ASSAP & mainstream advisers**
- **Potential to raise awareness of water quality on farms likely to respond**

Recap: 5 measures study looked at behaviour drivers of 1009 farmers and their intentions to adopt specific water quality improvement measures….

- Consistent with the literature, we find that:
- subjective norms, knowledge and cost are the primary drivers of farmers' intentions to adopt.

Using this information practically for ASSAP…

- WM/ASSPA applied expert knowledge to score each of the measures on a scale of 1-3 for each of the behavioural attributes found to be significant in the 5 measures study
- For example:

Knowledge

High level of know-how required – 3
Low level - 1

Farmer Norms

Others think measure is +ve - 3
Others think its –ve -1

Costs

High time, money/hassle cost – 3
Low cost - 1

Upfront?
Time?
Hassle?
Training

Characterisation of ASSAP measures in terms of knowledge, farmer norms, costs

Regressing attributes against measure adoption shows…

- In general…measures more likely to be adopted if they align with farmer norms
- upfront costs associated with a lower likelihood of an issue being addressed
- measures that involve loss of productive area are less likely to be adopted
- measures with a high knowledge requirement are more likely to be undertaken
  - » ASSAP measures with higher technical knowledge requirements result in greater advisor engagement, thus counter-balancing the knowledge challenge and highlighting the importance of localised and individualised support.

Learnings:

Intuitive…. but statistically significant

Future work: useful to categorise measures in relation to those most or least likely to be adopted based on measure characteristics…..

Psychology studies with Farmers & Advisers

5 - Farmers:

- Barrier: challenges for farmers in accessing supportive environments and resources
- *crucial role of trust in successful collaborations between advisers and farmers*

6 - Advisers:

- Barrier**: inability to prioritise water quality** in their daily work, inability to prioritise water quality in their daily work, perceived deficiencies in competency
- *prioritisation of pro-environmental water quality advice & provision of enhanced adviser supports*
- ***build advisers confidence** in engaging with farmers on water quality*

Learnings:

- Need to look at advisers' as well as farmers' needs
- Important for Policy-Makers & Extension Agencies in designing programmes/interventions

Psychology: Predicting farmer behavioural readiness to engage with water quality behaviours

Results show that:

- familiarity with AES - valid predictor of farmers' motivation
- larger farms exhibit higher levels of preparedness
- farmers involved in activities that contribute to diffuse P losses displayed a gap in their knowledge regarding water quality (psychological capability)
- livestock systems exhibit lower levels of behavioural readiness to adopt mitigation measures
- farmers with high risk of diffuse N losses face challenges in terms of skills (e.g. clover), habits (changing practices) and peer or professional support (groups, advisers) in engaging with pro-environmental water quality behaviours.

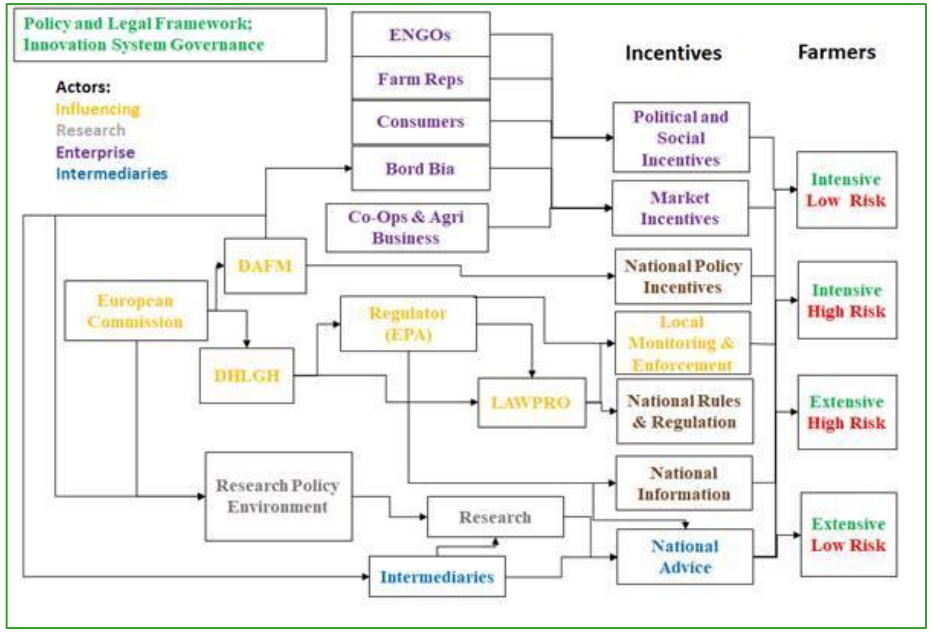
Learnings:

- **Different farmers have different levels of behavioural readiness**
- **Findings consistent across behavioural psychology and socio-economic studies**

WaterMARKE high level behavioural findings:

- **Key to driving behavioural change at farm level is recognition of**
- **one-to one** adviser (ASSAP) support to manage complexity
  - too nuanced to simplify advice
- **role of agricultural advisors across the AKIS** (Agricultural Knowledge Innovation System)
- need for **adequate, tailored knowledge and financial resourcing for mainstream advisers**
- Importance of entire **Innovation System** working together
  - **Water EIP**

Water Quality Innovation System 2018 -> 2023



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Take-home

Easy wins

- **Measures: low hanging fruit**
  - Characterise measures based on attributes
  - Highlight measures with Multiple Benefits for environment…
- **Farmer Norms:**
  - Working with Champion farmers and Discussion Groups to create positive norms around important measures
- **Knowledge:**
  - Foster greater understanding of how measures work
  - Greater awareness of measures locally > greater adoption

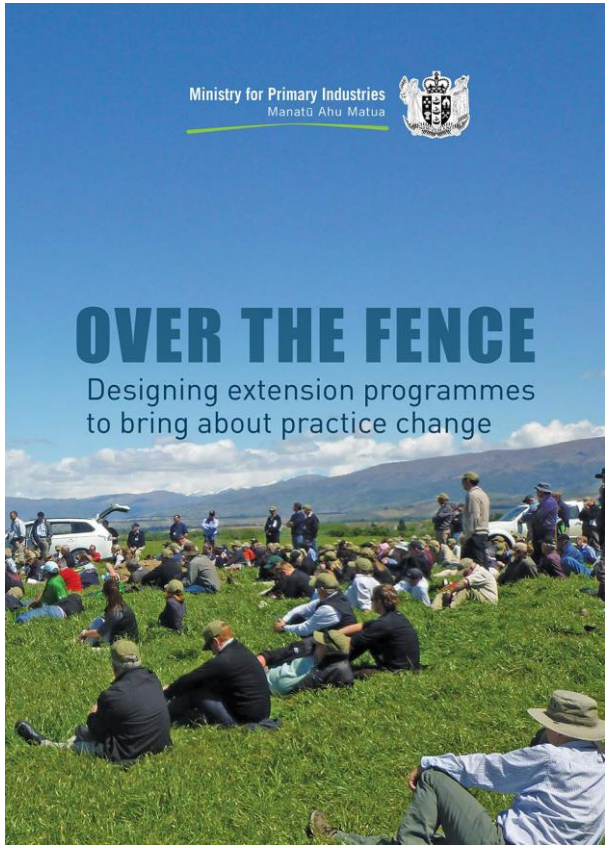
Areas for Future Focus

Advisers need dedicated time to skill-up and build confidence to engage on water quality with farmers.

- **Measures**
  - Characterise measures based on attributes
  - Highlight measures with Multiple Benefits for environment
  - Potential for further analysis of ASSAP measure to facilitate learnings for mainstream advisers
  - Costs – need a data-base of measure costs
  - Potential for WaterMARKE and Water EIP to inform next ACRES (through behavioural and cost findings)??

Relevance of behaviour…..

Over the Fence: Margaret Brown, Ag Research NZ



"Complexity may lead to greater inertia in adoption, as participants need more time and effort to develop their skills and understanding around the application and require some experience over time to fine tune those skills".

"An understanding of theories of behaviour change can help target extension programmes to gain the most successful and effective adoption possible".

Go raibh maith agaibh