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Common elements of pastoral farming systems as shown by causal mapping

Introduction

ARGOS is undertaking a long-term investigation of the sustainability of agriculture in NZ. As part of the social objective research, we have used a type of cognitive mapping called causal mapping to develop a better understanding of the management of farm systems, broadly defined to include economic, environmental and social factors, as seen by farmers. This method has been applied to the ARGOS kiwifruit orchardists, and to the sheep/beef and dairy sectors. Recently it has been applied to high country farms. A comparison of the results across the pastoral sectors allows us to determine the common elements of pastoral farming systems.

Method

The mapping method we used allows farmers to first identify the factors important in the management of their farm system broadly defined, and then by making their own map by connecting factors that causally influence each other. Farmers used a score from 1 to 10 to show the strength of the causal connection between factors. Each farmer completed a map. Data from each individual's map was then used to prepare an aggregated or group map for all ARGOS farmers in each sector. The map shows the centrality score for each factor, which is a measure of its importance within the farming system. The same process was used for 34

sheep/beef, 20 dairy and 8 high country farmers.

Results

Farmers in each of the three pastoral sectors commonly rated eight factors among the most important in terms of centrality score. Figure 1 below shows how these eight factors are related and includes averaged data across the three sectors.

The 'farmer decision maker' is the most important factor. This factor is connected to all other factors and five of these seven links are bidirectional, showing that these factors influence each other. Next in order of importance is 'quantity and quality of production' which is central to the productive side of the farm system being causally influenced by 'fertiliser and soil fertility health' and 'weather and climate' and, in turn, causally influencing 'cash farm income'. However, these other productive factors are less important than 'satisfaction' and 'family needs'. Satisfaction is achieved from production and meeting family needs. 'Family needs' has a direct influence on 'farmer decision maker'. This summary map is showing how farmers negotiate between productive and family factors.

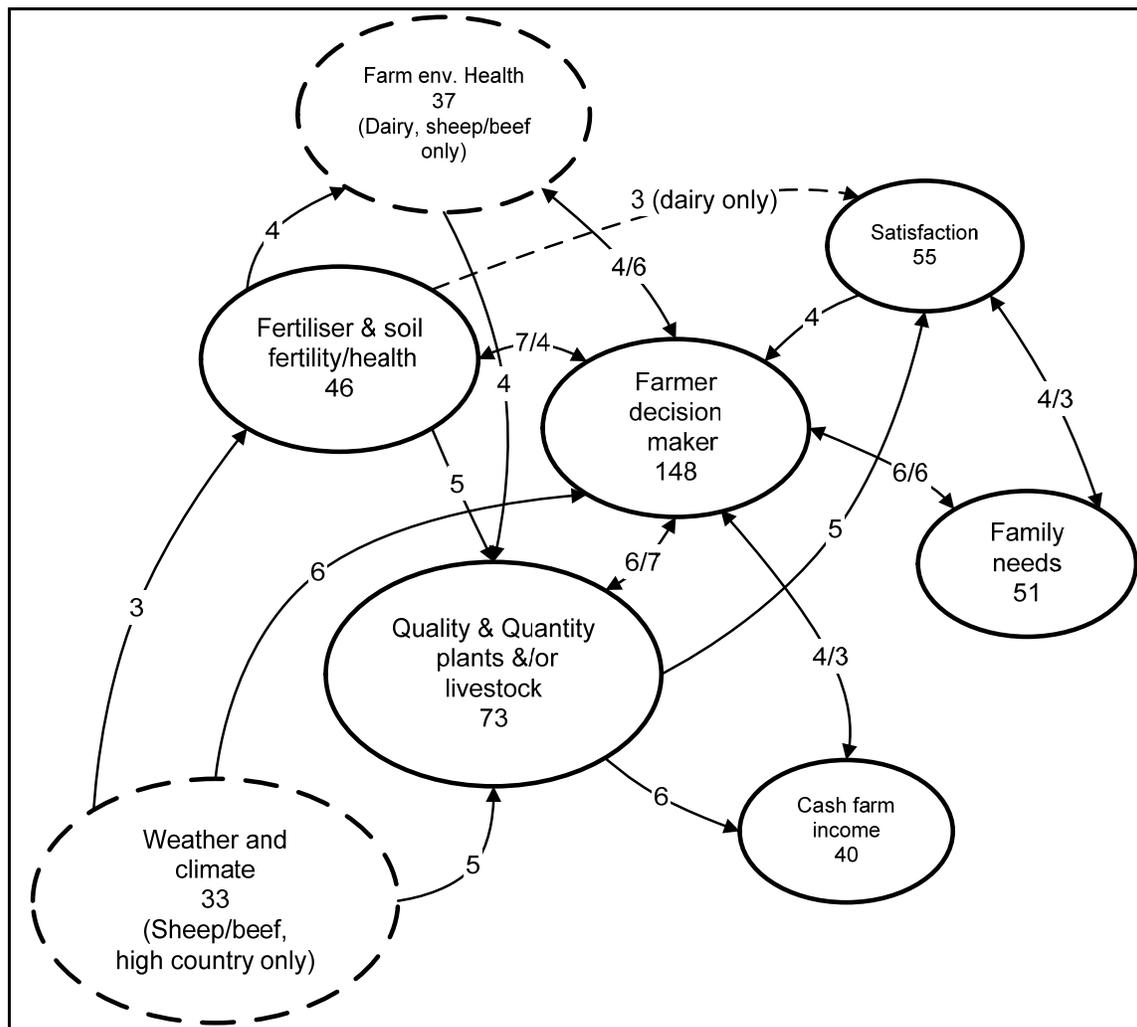
Less important than the factors already mentioned is farm environmental health which has a modest centrality score for dairy and sheep/beef only. Farm environmental

health is influenced by fertiliser and soil fertility health and the decisions made by the farmer. Its main causal influence is on quality and quantity of production. Note that farm environmental health is not strongly influenced by quality and quantity of production. Finally, weather and climate is the factor with the lowest average centrality score among these factors. It has a strong link to farmer decision maker and production.

Conclusion

Pastoral farmers in different sectors and in widely different parts of New Zealand agree on what constitutes the core elements of pastoral farming. These farmers are balancing personal, family and production factors as they manage a complex farming system.

Figure 1: The eight key factors in pastoral farming systems



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