

METHODOLOGICAL FRAMEWORKS FOR RESEARCH AND DEVELOPMENT ON IMPROVING LINKAGES AND THE COMPETITIVENESS OF SUPPLY CHAINS

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Abstract

This paper outlines methodological frameworks for conducting research and development with agribusiness supply chains in transitional economies where the objective is to improve the competitiveness of the supply chains in a global environment. The key difficulty when operating with supply chains is the complexity of the issues involved because constraints can occur from production by small farmers through to the relationship between retailers and consumers. Failure to address key constraints can lead to failure to have any impact. This creates problems for integrating research, because researchers are generally trained in disciplines that cover only a small proportion of the issues and operate from differing epistemologies. The other difficulty is to incorporate a framework for change management, since good research is not much use unless it leads to positive outcomes. A framework for managing these problems is outlined, which has been developed and trialled in work with vegetable supply chains in the Philippines and coffee supply chains in PNG. The framework incorporates a dualistic agribusiness systems model for mapping the chain issues and combines this with a pluralistic framework derived from Checkland's soft systems methodology for research analysing the system. This is integrated with a participatory action research methodology for change management.

Keywords: rural development, dualistic agribusiness systems, pluralistic research, participatory action learning

Introduction

Until the last two decades, much research and development work in agriculture focussed on transferring production technology to small farmers in the hope that this would lead to improvements in their productivity and would enable them to compete with farmers from other regions and countries. Such top-down approaches have been widely critiqued because of their perceived failure (e.g. Tully 1963; Chambers 1983). More recently there has been a shift towards more 'bottom-up' or participatory models of development, although people have been advocating these models for over half a century.

Participatory models have promoted more farmer-centred approaches rather than focussing on particular innovations or commodity specific activities. Such models have relied on building capacity of small farmers and their communities to enable them to compete in globalised world markets. Ladders of participation (e.g. Arnstein 1969; Pretty 1995) are represented hierarchically and imply that more participation is better and that the ultimate method for achieving change is to adopt the top level of participation. Hayward et al. (2004) have challenged the idea that participation is necessarily a solution to complex social problems. For different reasons, Gladwin et al. (2002) argues that participatory research methods are necessary but not sufficient for conducting development work.

Another view is that what is required is a partnership between farmers, extension, researchers and industry in order to develop effective solutions to industry problems (Schulz et al. 2004). Such a

partnership model is consistent with level 6 of the 8 levels in Arnstein's typology or level 6 of the 7 in Pretty's typology. We can extend the partnership view of participation to development work with farmers from transitional farmers in the increasingly globalised market place for food because the constraints to small farmers competing in such markets are complex and varied. Part of the issue is that participation and empowerment is only one part of the solution to development problems, just as technology is another part.

Other researchers (e.g. Mingers 2001; Harriss 2002; Kanbur 2002; Madsen & Adriansen 2004) have focussed on the need to combine disciplines when tackling complex problems. Researchers have suggested various approaches and names for combining disciplines or research methods including: multidisciplinary, cross-disciplinary, interdisciplinary, multi-methods, multi-methodology, methodological pluralism and pluralistic methodology. Such approaches are becoming more widely used in development work because of the multidimensional and complex nature of the social, economic and technical problems faced. Each discipline has its strengths and weaknesses and the partnership of these disciplines can lead to richer and more reliable solutions to complex problems. The difficult issue is the framework and processes used to combine the disciplines and their various philosophical paradigms while retaining the ability of the disciplines to maintain their scientific rigour.

Since the ultimate aim of most development work with small farmers is to improve the economic well-being of them and their communities, the focus of research and development has a need to focus on those constraints and their causes limiting farmers' ability to achieve this. The complexity of the causes for these constraints requires them to be addressed at different levels of the causal relationship (Mikkelsen 2005). In order to identify the causes and their linkages, some holistic or systems framework is required to guide the investigation.

In this paper, one method for addressing these issues is outlined that combines a dualistic agribusiness systems model with a pluralistic research framework and a participatory learning model. It is developed from work conducted with small farmers in South Africa, in the vegetable industry of the Philippines and the coffee industry in Papua New Guinea.

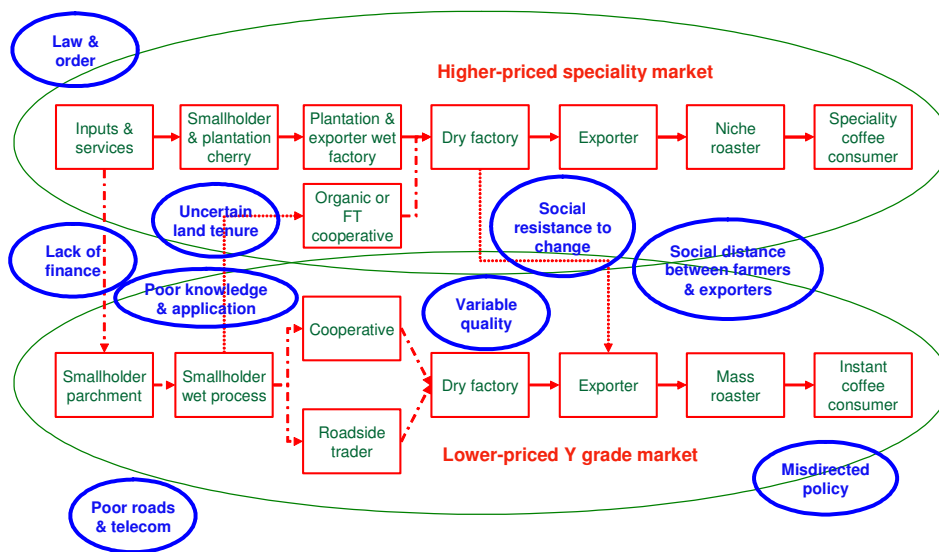
A Dualistic Agribusiness Systems Model

Murray-Prior and Ncukana (2000) developed the concept of a dualistic agribusiness systems model to help with analysing the issues facing resource poor farmers in South Africa, particularly from the former homelands, in their struggle to raise their standard of living in a globalised agribusiness system. A key issue faced by small-scale producers from many industries in transitional economies is how to change their production and marketing systems to enable them to shift from supplying their produce to low-priced markets to supplying the needs of the growing higher-priced institutional markets. World Trade Organization and bilateral trade agreements have opened up markets in and to transitional economies. These changes create both opportunities and threats for small farmers because the demands of the new markets require them to significantly increase the quality of their produce. The issues involved in achieving this are complex and failure to address a number of key constraints can lead to failure to have any impact.

In the face of this complexity, a dualistic agribusiness systems model has proved useful in conceptualising the issues associated with enhancing the profitability and competitiveness of vegetable supply chains in the Philippines (Murray-Prior et al. 2004; Murray-Prior et al. 2006) and coffee supply chains in Papua New Guinea (Murray-Prior & Batt 2006). It is derived from a simple agribusiness systems model (Murray-Prior et al. 2003) that incorporates the elements of a supply chain, logistics and information flows along the chain, chain management, waste, and elements external to the system such as the socio-economic and political environment and the agro-climatic-ecological environment.

PNG has two coffee chains that can be conceived as being two separate (or dualistic) agribusiness coffee systems that are a remnant of colonial occupation (Murray-Prior & Batt 2006). The plantation system produces higher quality coffee for the speciality market, while the smallholder system produces coffee for the soluble market. While PNG Arabica coffee has the potential to be sold into the speciality market the current smallholder chain is highly unlikely to achieve this in its current form. Figure 1 is an example of the dualistic model based using the PNG coffee industry. It illustrates the complexity of the issues facing smallholder coffee producers in their efforts to produce coffee suitable for the speciality coffee market rather than the soluble coffee market. As can be seen the agribusiness system model provides a guide for representing supply chains as well as a checklist for research and development into the problems faced by smallholders in their attempts to produce product suitable for higher-priced markets.

Figure 2: Dualistic model of coffee supply chains in PNG including some of the constraints to improving its competitiveness



A Pluralistic Research Framework

Complexity also creates problems for conducting and integrating research into agribusiness systems. Generally, researchers’ training is in disciplines that cover only a small proportion of the issues and they can operate from differing epistemologies. Therefore, while multi-disciplinary teams of researchers are required, in order to be effective some process is required to integrate the various discipline-based research projects. In fact, the process needs to start earlier than this, in that we need to identify the problems to address from a systems or holistic perspective, not from a disciplinary perspective. Murray-Prior et al. (2004) developed and implemented a pluralistic framework based, in part, on Jackson’s (1999) call for a meta-methodology to deal with complex problems. Jackson suggests using a soft-systems paradigm based on the initial processes developed by Checkland (1999) to gain initial understanding of the system and to follow the learning cycle implicit in the soft systems methodology. Murray-Prior et al. (2004) refined this process to include six steps:

1. Analyse the system with stakeholders.
2. Structure the problem statements & determined what methodologies are appropriate to research each of the problems.
3. Formalise understanding of the problem – may involve hard and soft systems research on problems that have been identified.
4. Verify understanding with reality – involves comparing and discussing the findings from the various methodologies and then discussing them with stakeholders.
5. Debate desirable and feasible change.

6. Take action to improve the situation.

The soft-systems framework has proven useful in providing a clearer picture of system boundaries, the relationships among chain participants, the institutional frameworks within which actors operate and most importantly the key constraints to improvements in the system. When combined with the agribusiness systems model it helps maintain focus on the whole picture rather than taking a reductionist approach to the problem.

Another advantage of this approach is that it enables a systems approach to the whole problem while allowing researchers to remain consistent to the theoretical foundations of their discipline. Methods, models and techniques are not separated from their theoretical foundations and consequently improvements can be made within particular theoretical frameworks. However, it does challenge researchers, because sometimes methodologies may be employed side-by-side to investigate particular problems and may give inconsistent or diametrically opposite results (Murray-Prior et al. 2003). This forces researchers to question the validity of the assumptions of their theories and to examine problems from different theoretical perspectives. Researchers are therefore educated about other ways of looking at a problem and gain a greater understanding of the strengths and weaknesses of their own and other disciplines.

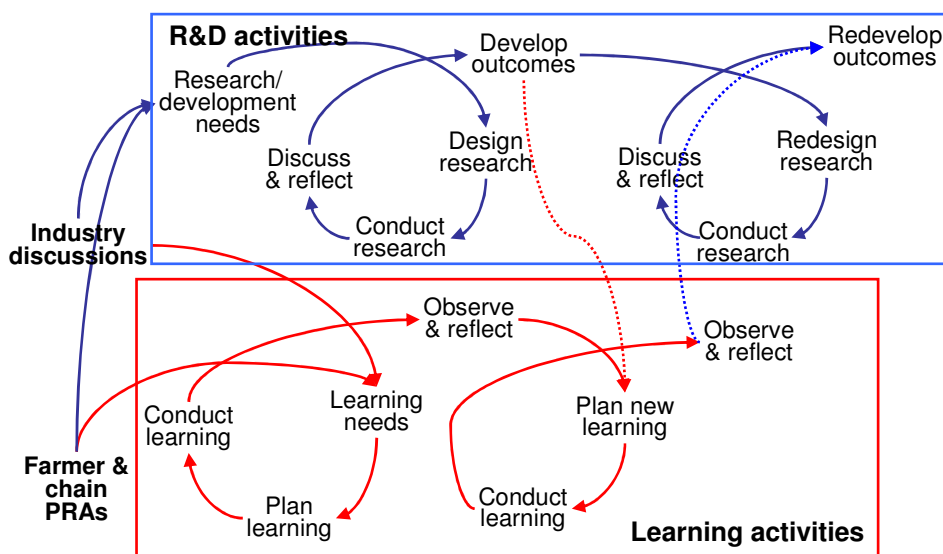
A Participatory Action Learning Process with Chains and Industry

While the pluralistic research framework outlined above implies consultation with actors and stakeholders involved with chains in planning research, its focus is on the research activity and does not explicitly address the issue of facilitating the change process at the farm, chain or industry level. The concept of a partnership model (Schultz et al. 2004) was extended from relationships and participation at the farm systems level to relationships and participation at the chain systems level and with industry and government institutions. Therefore, the agribusiness systems model helps guide the selection of the actors and stakeholders to involve in this process, but it is implemented through a participatory action learning process. At the farm level, this occurs with farmer groups, beginning with a Participatory Rural Appraisal process. At the chain level, a similar process occurs with selected actors from the chain, including representatives from the farmer group.

This addition to the approach came about as a result of perceived failures or weaknesses in our project with vegetable farmers in Mindanao, Philippines and from a need to integrate with a Participatory Rural Appraisal and Planning Process being implemented by the Coffee Industry Corporation in PNG. In the former case we recognised that our strategy for change in Mindanao was ad hoc and while it did involve consultations with farmers, traders and retailers the process for change was not formalised or guided by a coherent process. Part of the answer was provided by recognition that in the case of the PNG coffee industry, more research on its own was not the answer, and that we needed to involve farmers in a learning process so they could learn more about the constraints to improving their profitability. Another weakness in our method we had identified was that we had not done enough to encourage linkages and understanding along the chain. Consequently, we believed that a participatory learning process would be the best solution to this issue.

We use the participatory action learning process to help structure and prioritise research problems and to identify and prioritise learning needs (see Figure 2). The prioritised research needs are key inputs to Steps 1 & 2 of the pluralistic research framework and the chain actors are partners in this process. The formalisation of this process also provides a feedback mechanism for Steps 4, 5 and 6 to verify understanding of the outcomes of the research, debate desirable changes and to take action to improve the situation.

Figure 3: Participatory action research, development & learning cycle with farmers, chain & industry



At the same time, the process helps identify and prioritise learning needs for farmer and chain actors, which are then addressed through organised learning activities. Outcomes from research are also fed into the learning activity cycle and outcomes or observations from the learning activities can be fed into the research and development cycle. This is an ongoing process, where reflection on learning activities and experiences from implementation of change are discussed and provide input to revise research, development and learning activities. Conceptually and in practice, this is a multi-level action learning process; one level with farmer groups, one level with chain actors, and another level with industry and political institutions.

The focus of the research project also necessarily influences and constrains the focus of the learning and research activities. In the case of the PNG coffee industry project, the focus is on improving the price received by farmers through increasing the proportion of coffee that achieves the standard necessary for sale in the speciality market. Consequently, research and development effort concentrates on marketing and chain relationship issues, although some of the learning activities relate to production and processing issues. However, information from the participatory processes inputs into other research projects dealing with pest and disease and post-harvest problems. In the case of the Philippines vegetable chain projects, the projects' foci are more holistic and research and development activities conducted by the projects were and will have a more paddock to plate scope. Consequently, while the project can address some of the issues, we endeavour to influence and involve other actors with influence or resources that could benefit the agribusiness system to address the issues that are beyond the scope and resources of the project to address.

Conclusion

Conducting research and development work in transitional economies to deal with the issues faced by small farmers and local businesses who are struggling to compete in globalised world markets is difficult and complex. Many issues constrain their ability to compete and focussing on just one of these issues is generally unsuccessful because farmers and businesses may not be in a position to implement any recommendations dealing with this issue because of the other constraints. In this paper, a methodological framework for conducting research and development with agribusiness supply chains is outlined which

suggests a series of processes and models for dealing with this complexity that may increase the chances of achieving a positive impact. It consists of three components:

- A dualistic agribusiness systems model that helps guide investigation of the system so that important elements are less likely to be omitted.
- A pluralistic research framework to help identify which issues need to be researched, what methodologies are appropriate for that research and to integrate research conducted by a multi-disciplinary team of researchers.
- A participatory action research, development and learning process to involve actors and stakeholders, enhance their ownership of project activities, and increase their capacity to change and overcome the constraints to their involvement in higher value markets.

Experience from a range of projects in transitional economies has led to the development of this framework, which is still in the process of development and evaluation. As is obvious from the reference to projects over time, each element in the framework was developed as part of an ongoing learning process, in an effort to overcome weaknesses identified with our research activities at various stages in these projects.

Acknowledgements

I acknowledge financial support from the Australian Centre for International Agricultural Research for projects in the Philippines and PNG, which led to the development of many of the ideas presented here. I would also like to acknowledge members of the research teams in these projects who were involved in the development of some of the ideas or commented on the models I presented. In particular, I would like to acknowledge: Murray McGregor, Peter Batt, Sylvia Concepcion, Fay Rola-Rubzen, Larry Digal and Nerlie Manalili.

References

- Arnstein, S. 1969, 'A ladder of citizen participation', *American Institute of Planners Journal*, July, 216-224.
- Chambers, R. 1983, *Rural development: Putting the last first*. Longman, Harlow, England.
- Checkland, P. 1999. *Systems thinking, systems practice: Includes a 30-year retrospective*, Wiley, Chichester, England.
- Gladwin, C.H., Peterson, J.S. & Mwale, A.C. 2002, 'The quality of science in participatory research: A case study from Eastern Zambia', *World Development*, 30(4), 523-543.
- Harriss, J. 2002, 'The Case for Cross-Disciplinary Approaches in International Development', *World Development*, vol. 30, no. 3, 2002/3, pp. 487-496. <http://www.sciencedirect.com/science/article/B6VC6-44TCXS3-1/2/96b795a1a6a99fdfa4a4b310e38f588c>.
- Hayward, C., Simpson, L. & Wood, L. 2004, 'Still left out in the cold: problematising participatory research and development', *Sociologia Ruralis*, 44(1), 95-108.
- Jackson, M.C. 1999. 'Towards coherent pluralism in management science', *Journal of the Operational Research Society*, 50(1), 12-22.

- Kanbur, R. 2002, 'Economics, Social Science and Development', *World Development*, 30(3), 2002/3, 477-486.
- Madsen, L.M. & Adriansen, H.K. 2004, 'Understanding the use of rural space: the need for multi-methods', *Journal of Rural Studies*, 20, 485-497.
- Mikkelsen, B. 2005, *Methods for development work and research: a new guide for practitioners*, 2nd edn, SAGE Publications, New Delhi.
- Mingers, J. 2001, 'Combining IS research methods: Towards a pluralistic methodology', *Information Systems Research*, 12(3), September, 240-259.
- Murray-Prior, R. & Batt, P. 2006, 'Emerging possibilities and constraints to PNG small-holder coffee producers entering the speciality coffee market', Paper presented to: International Symposium on Fresh Produce Supply Chain Management, Lotus Pang Suan Kaeo Hotel, Chiang Mai, Thailand, 6-10 December.
- Murray-Prior, R. and Ncukana, L. 2000, Agricultural development in South Africa - A dualistic agribusiness systems perspective, Paper presented to the 'African Studies Association of Australasia and the Pacific 23rd Annual and International Conference: African Identities, St Marks College, University of Adelaide, North Adelaide, South Australia, 13-15 July 2000.
- Murray-Prior, R., Batt, P.J., Rola-Rubzen, M.F., McGregor, M.J., Concepcion, S.B., Rasco, E.T., Digal, L.N., Montiflor, M.O., Hualda, L.T., Migalbin, L.R., Manalili, N.M. 2006, 'Global value chains: a place for Mindanao producers?' in P.J. Batt (ed.), *Proceedings of the 1st International Symposium on Improving the Performance of Supply Chains in the Transitional Economies, Acta Horticulturae* 699, January 2006, ISHS, Belgium, 307-315.
- Murray-Prior, R.B., Concepcion S., Batt, P., Rola-Rubzen, M.F., McGregor, M., Rasco, E., Digal, L., Manalili, N., Montiflor, M., Hualda, L. & Migalbin, L. 2004, 'Analyzing supply chains with pluralistic and agribusiness systems frameworks', *Asian Journal of Agriculture and Development*, 1(2), 45-56.
- Murray-Prior, R.B., Rola-Rubzen, M.F., McGregor, M., Batt, P., Concepcion S., Rasco, E., Digal, L., Manalili, N., Moran, A., Ellson, A., Montiflor, M., Hualda, L. & Migalbin, L. 2003, 'A pluralistic methodology for analysing supply chains' in *Proceedings of the Australian Agricultural and Resource Economics Society Conference*, Fremantle, WA, 11-14 February 2003.
- Pretty, J.N. 1995, *Regenerating agriculture: policies and practice for sustainability and self-reliance*, Earthscan Publications, London.
- Schulz, L., Murray-Prior R.B., Storer, C.E. and Walmsley, T., 2004, 'Overcoming difficulties with outsourcing in partnership extension models: lessons learned from TOPCROP West', *Australian Journal of Experimental Agriculture*, 44 (3), 223-31.
- Tully, J. 1964, 'Operational research in agricultural extension in Queensland', *Agricultural Progress*, XXXIX, 7-11.