On the Effectiveness of Participatory Research in Agriculture

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Dedication

This thesis is dedicated to all farming families (custodians of our natural resources) who dare to embrace the great challenge of change for the better of all in their own lives, communities, and industries.

I owe much to Rufus for patiently Behaving himself on farms throughout New South Wales, for his ability to stick in farmer’s minds so they could, by association, remember who on earth I was, and for his unswerving loyalty as navigator throughout our seemingly endless road trips.
Acknowledgements

In completing this research I am deeply indebted to my supervisors for their patience, guidance, and, for their expertise. In particular I would like to thank Alan Andrews, Roger Packham, Tony Dunn, Michael Friend, and, Nadarajah Sriskandarajah for looking on from afar.

Within the Profitable Pastures Project I benefited greatly from the time and resources provided by all members of the project management team and especially its first coordinator Mike Ison, John Read who assisted my navigation of government departments, and the two dairy farmer members Gavin Moore and Irene Carle for keeping all our feet firmly on the ground.

The Profitable Pastures Project depended upon the good will of dairy farmers and their local communities, and I am grateful for their enthusiasm in contributing to the project either individually or within their collective Regional Dairy Groups across New South Wales. I am similarly thankful to the institutions that made this research possible including Dairy Australia, the Dairy Industry Development Company, the University of Western Sydney, Charles Sturt University and NSW Agriculture.
Statement of Authentication

The work presented in this thesis is, to the best of my knowledge and belief, original except as acknowledged in the text. I hereby declare that I have not submitted this material, either in full or in part, for a degree at this or any other institution.

JESS JENNINGS

Signature: ... ... ... ... ... ... ... ... Date: ... ... ... ... ... ...
# Table of Contents

List of figures and boxes ........................................ ii  
Abbreviations ........................................ iii  
Abstract ................................................................ iv  
Preface ................................................................ vii  
**CHAPTER 1 — INTRODUCTION**  
1.1 Research context ........................................ 10  
1.2 The research question ................................ 16  
1.3 The PhD-PPP Relationship ......................... 20  
1.4 Thesis structure .......................................... 22  
**CHAPTER 2 — METHODOLOGY REVIEW**  
2.1 Choosing qualitative methodology ............... 24  
2.2 Theory-generating versus theory-directed research 32  
2.3 Action Research as methodology ................. 33  
2.4 Extension as methodology .......................... 43  
2.5 Combining methodologies for this research ....... 55  
**CHAPTER 3 — METHOD SELECTION**  
3.1 Method selection for this thesis .................... 58  
3.2 Elements of ethnography ............................ 61  
3.3 Qualitative research techniques .................... 64  
3.4 Foucauldian method ................................ 68  
3.5 Summary of method selection ..................... 75  
3.6 Ethical conduct and researcher frame of reference 77  
**CHAPTER 4 — PROFITABLE PASTURES PROJECT IN THEORY AND PRACTICE**  
4.1 Birth of the Profitable Pastures Project .......... 80  
4.2 Experiences from the field ......................... 92  
4.3 Transformations from Phase 1 to Phase 2 ......... 108  
4.4 Case Studies from the Profitable Pastures Project 112  
4.5 The Profitable Pastures Project in perspective 126  
**CHAPTER 5 — PRIMARY TIER RESEARCH: LEARNINGS ABOUT THE APPLICATION OF AL/AR WITH NSW DAIRY FARMERS**  
5.1 Theoretical distinction between Action Learning and Action Research 131  
5.2 Clarifying the method of AL/AR ................... 145  
5.3 Principles of AL/AR for agricultural development 156  
5.4 Reflective behaviour and industry accountability 159  
5.5 Farmer Forums .................................. 165  
**CHAPTER 6 — SECONDARY TIER RESEARCH: PARTICIPATION THEORY**  
6.1 Why a theory of participation? .................... 174  
6.2 Four general principles of Participation Theory 179  
6.3 The Participation Decision ........................ 187  
6.4 Applicability of Participation Theory ............ 188  
6.5 The Three Modes of AL/AR and Participation Theory 192  
**CHAPTER 7 — TERTIARY TIER RESEARCH: THE ORIGIN OF EXTENSION**  
7.1 Premise for researching the origin of extension 197  
7.2 *General History*, defining extension and locating its origin 198  
7.3 Archaeology of the origin and history of extension 201  
7.4 Genealogy of agricultural wisdom ............... 220  
**CHAPTER 8 — IMPLICATIONS AND CONCLUSIONS**  
8.1 Primary tier research implications ............... 230  
8.2 Secondary tier research implications .......... 236  
8.3 Tertiary tier research implications ............... 240  
8.4 Conclusion ..................................... 245  
References ................................................. 248
List of figures and boxes

Figures
Figure 1: Geography of the Profitable Pastures Project. 11
Figure 2: Profitable Pastures Project organisational chart. 13
Figure 3: Theory and practice in the Profitable Pastures Project. 16
Figure 4: Research tiers of the Profitable Pastures Project. 18
Figure 5: Methodologies, methods and their application. 25
Figure 6: Types of action research and their main characteristics 43
Figure 7: Rogers’ categorisation of adopters and the sigmoid logistic curve. 46
Figure 8: Pluralist and isolationist methodologies and their methods. 60
Figure 9: Research roles. 76
Figure 10: Sample of Regional Dairy Group data 95
Figure 11: Rowan’s impact of types of research. 99
Figure 12: Phase 2 logo of the Profitable Pastures Project. 111
Figure 13: Participation levels at teleconferences and farmer conferences. 119
Figure 14: Comparison of farmer conferences. 126
Figure 15: Total expenditure and in-kind support by Regional Dairy Groups. 128
Figure 16: Aggregated proportional value of Regional Dairy Group projects. 129
Figure 17: Schematic illustration of activity levels within the Profitable Pastures Project. 130
Figure 18: Spectrum of spatial and temporal boundaries. 156
Figure 19: Communities of Practice. 169
Figure 20: Determinants of Participant Commitment Capacity. 179
Figure 21: General principle of Participant Commitment Capacity. 180
Figure 22: General principle of Participation. 181
Figure 23: Manifestations of Participatory Cost. 186
Figure 24: General principle of the Participation Decision. 188
Figure 25: Definition of agricultural extension applied in this research. 199
Figure 26: Growth of English farming publications 1523 to 1860. 204

Boxes
Box 1: Expected Industry Outcomes of the Profitable Pastures Project. 14
Box 2: PhD Position with the Profitable Pastures Project. 21
Box 3: Background to the Profitable Pastures Project. 81
Box 4: Industry consultation by the Profitable Pastures Project. 82
Box 5: PPP brochure. 85
Box 6: Methodology of the Profitable Pastures Project. 88
Box 7: Method and stages of the Profitable Pastures Project. 89
Box 8: Transferring results in the Profitable Pastures Project. 90
Box 9: Aims, objectives and output of the Profitable Pastures Project. 91
### Abbreviations

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
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<tbody>
<tr>
<td>AFSA</td>
<td>Australian Farming Systems Association</td>
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<tr>
<td>AL</td>
<td>Action Learning</td>
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<tr>
<td>AL/AR</td>
<td>Action Learning / Action Research</td>
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<tr>
<td>APEN</td>
<td>Australasia-Pacific Extension Network</td>
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<tr>
<td>AR</td>
<td>Action Research</td>
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<td>CST</td>
<td>Critical Systems Theory</td>
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<td>CSU</td>
<td>Charles Sturt University</td>
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<td>DA</td>
<td>Dairy Australia</td>
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<td>DAFF</td>
<td>Department of Agriculture, Fisheries and Forestry</td>
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<tr>
<td>DCP</td>
<td>Data Collection Point</td>
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<tr>
<td>DIDCO</td>
<td>Dairy Industry Development Company</td>
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<td>DRDC</td>
<td>Dairy Research and Development Corporation</td>
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<td>FSR</td>
<td>Farming Systems Research</td>
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<td>GST</td>
<td>General Systems Theory</td>
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<td>IFSA</td>
<td>International Farming Systems Association</td>
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<tr>
<td>L/dha</td>
<td>Litres per dairy hectare</td>
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<td>LT</td>
<td>Leadership Team</td>
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<tr>
<td>M&amp;E</td>
<td>Monitoring and Evaluation</td>
</tr>
<tr>
<td>MSC</td>
<td>Most Significant Change</td>
</tr>
<tr>
<td>NSW</td>
<td>New South Wales</td>
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<tr>
<td>NSW Ag</td>
<td>NSW Agriculture</td>
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<tr>
<td>PAR</td>
<td>Participatory Action Research</td>
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<tr>
<td>PPP</td>
<td>Profitable Pastures Project</td>
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<tr>
<td>PPPLT</td>
<td>Profitable Pastures Project Leadership Team</td>
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<tr>
<td>Practical AL/AR</td>
<td>Practical Action Research</td>
</tr>
<tr>
<td>RD&amp;E</td>
<td>Research, Development and Extension</td>
</tr>
<tr>
<td>RDG</td>
<td>Regional Dairy Group</td>
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<tr>
<td>Technical AL/AR</td>
<td>Technical Action Research</td>
</tr>
<tr>
<td>TT</td>
<td>Technology Transfer</td>
</tr>
<tr>
<td>USDA</td>
<td>United States Department of Agriculture</td>
</tr>
<tr>
<td>UWS</td>
<td>University of Western Sydney</td>
</tr>
<tr>
<td>WUE</td>
<td>Water Use Efficiency</td>
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Abstract

This thesis examines the effectiveness of participatory research processes as a form of agricultural extension within the Australian Dairy industry, and specifically, addresses the question: *Does Action Research provide an effective methodology and method(s) for enacting farmer-driven research?* The experiences of the Dairy Australia-funded Profitable Pastures Project (PPP), delivered to farmers across New South Wales from 1999 to 2003, provided the context within which Action Research was assessed. Data were derived from journal records of the researcher’s personal experiences as a participant-observer, a PhD candidate, and project coordinator. The other main data sources were industry reports that tracked the progress, outputs and outcomes of PPP. A three tiered research framework, consisting of Primary, Secondary and Tertiary levels was devised as a basis to direct research, and interpret results.

The primary tier of research results suggest Action Research is an effective tool for enacting farmer-driven research, although a variety of procedural modifications to the method of delivery are suggested. These include: (1) the clarification and consistent usage of terms within participatory research and extension methods (eg the distinction between Action Learning and Action Research; (2) the development of the concepts of spatial and temporal boundaries for use with Action Research processes; and (3) facilitating reflective behaviour within farmer-driven Action Research as a mechanism to achieve local project and industry accountability.

A further finding within the primary tier of research was that dairy farmers were capable of increasing their role in local level learning and research activities, which in PPP were supported by Emancipatory Action Research method and
related methodology. PPP provided its farmers with an unprecedented share of control over their learning and research agenda and its implementation, which critically included project resources. As a result these farmers experienced higher levels of ownership and responsibility for on-farm change than would have been expected from conventional top-down extension. This thesis reports a range of extension innovations that facilitated an increased role for farmers within industry learning and research processes. These innovations include conferences where farmers play dominant roles in both the conference presentation and audience participation aspects within a professional conference format.

The secondary tier of research addressed the theoretical implications of the primary experiences, and responds to an identified need to develop a universally applicable theory of participation. Participation Theory is presented and can be applied across different participatory research contexts while maintaining an objective, and hence comparable, appreciation of the dynamic elements of individual and group-based participation. The four key concepts that comprise Participation Theory: Commitment Capacity, Participation, Participatory Perception, and Participatory Cost, are theoretically linked to better understand the complexity of variables present within applied participatory research.

The tertiary tier of research transcends both the practical and theoretical aspects of participatory research, as they relate to the agricultural context, by exploring issues concerned with the fundamental characteristics of agricultural extension. It looks beyond contemporary structures and conventions within agricultural extension to identify why, how and when extension came into being. This long-run historical investigation of the fundamental causal factors that led to the origin and subsequent development of extension practice is presented as a contribution to existing extension literature. A Foucaultian approach was used to search for a deeper explanation as to why a relatively low level of farmer-driven learning and research exists within industrial agriculture – the same scenario PPP attempted to reverse within the dairy industry.

Conclusions are drawn that contemporary extension practice can be improved by better linking the on- and off-farm domains using participatory research processes
such as Action Research. Meeting this challenge appears increasingly urgent in light of a globally relevant and strengthening off-farm environmental agenda that requires democratic engagement amongst greater numbers of agricultural stakeholders. This environmental agenda also places still greater demands on farmers, their management systems and the products and effects of the on-farm domain.
Preface

The peasants around Versailles had never seen him put such energy into explaining his methods; …into ordering cartloads of manure to be delivered to them when he didn’t actually drive it there himself; into visiting them in their houses in the evening and reading aloud whole pages from Crescenzi’s book on rural and agricultural improvement or the great Olivier de Serres’ volume on farm management. For he had resolved to give these men and women all of what little he had in order that their lives, and his own, should change at last.

(Richaud (2001, p67))
Chapter 1 — Introduction

People have asked me which was better — poultry farming or dairy farming. Well, you’ve got to milk a cow, but a hen does her own egging. Mind you, there’s a lot to be said for dairy farming. A lot of farmers say it, too. I don’t blame them much, although I never did approve of bad language.

Lennie Lower (1963, p76-77)

1.1 Research context
This thesis draws upon experiences from the New South Wales dairy industry. These experiences are examined from the academic perspectives of Extension and Action Research (AR), within the broad context of Farming Systems Research (FSR).

Industry Context: Dairy Farming in NSW
The number of farms in the Australian dairy industry has consistently decreased during the post-war period. More specifically, in 1998-99 approximately 1770 dairy farms existed in the NSW industry, with farmers predominantly using
pasture based feeding systems (Dairy Australia 2004). By 2002-03 the number of farms in NSW had decreased to approximately 1290.

This research focuses on a NSW dairy industry project known as the Profitable Pastures Project (PPP), which operated from February 1999 to June 2003. This period witnessed a continued declining trend in the number of NSW dairy farms, partly fuelled by the effects of deregulation of the national milk market and drought conditions.

PPP engaged with industry through seven Regional Dairy Groups (RDG) that are incorporated entities comprising farmer representative boards in each of the major dairying regions in sub-tropical NSW (Figure 1).

**Figure 1: Geography of the Profitable Pastures Project.**

![Map of Profitable Pastures Project](image)

(DIDCO 2002)

**Funding and structure of the Profitable Pastures Project**

PPP was funded by the Federal dairy research agency, Dairy Australia (DA), formerly the Dairy Research and Development Corporation (DRDC), and
managed by a multi-institutional Leadership Team (PPPLT) comprised of five separate organisations. Member organisations of the PPPLT were:

- NSW Agriculture (state government),
- Charles Sturt University (CSU),
- University of Western Sydney (UWS), and the
- Dairy Industry Development Company (DIDCO).

DIDCO is a NSW-based and farmer-run division of Dairy Australia (also known as a Regional Development Program). Figure 2 illustrates the PPP organisational Chart.

PPP was implemented in two consecutive phases, with Phase 1 from February 1999 to December 2001, and Phase 2 between January 2002 and July 2003. Phase 1 was operated in four stages, while Phase 2 did not have a formal structure. Box 1 states PPP’s anticipated industry outcomes, as found in the original project proposal submitted to Dairy Australia.

Individual farmers, and the local groups they formed, were the primary intended beneficiaries of PPP. By helping these people to increase their confidence in assessing technology for adoption, the industry would be served by an agenda of on-farm productivity gain. PPP was considered a pilot project that would apply, and in so doing test, the Action Research method as a means for achieving agricultural research and extension (Diarised Journal). Based on PPP experience in NSW, assessments could be made about the value of transferring PPP methods to other sections of the Australian dairy industry.
Figure 2: Profitable Pastures Project organisational chart.

$ denotes dollar funding
NB: RDGs provide significant levels of in-kind support to their own local activities, including farmers’ time, and resources from agricultural service providers.

(Dairy Australia 2003)
Box 1: Expected Industry Outcomes of the Profitable Pastures Project.

- An increase in milk production per dairy hectare of 10%, in 10% of NSW Dairy farms. Assuming average milk production from pasture at 2600L/dha (litres per dairy hectare), and the average price per extra litre of milk to be $0.25, the extra 260L will result in an average of $8060 extra milk income per 124ha dairy farm. This increase in 10% of NSW dairy farms (185 farms) would result in $1.49 million extra milk income in NSW dairy farms per annum.

- Improved information on current limitations to milk production from pasture which can be used to set future research priorities.

- Future benefits will include quicker uptake of new knowledge and technology through increased farmer confidence in assessing the usefulness of such technology and knowledge to their system.

(Dairy Australia 1996)

Academic Context: Farming Systems Research

Farming Systems Research has provided a broad theoretical framework for this research, largely because of its wide ranging sources and diversity of content. Collinson (2000, p1) considers FSR in the following manner:

*FSR itself is defined as a diagnostic process: a basket of methods for researchers to elicit a better understanding of farm households, family decisions and decision-making processes. ... Perhaps the most telling change over time is the shift from the farm system 'per se' as a framework, to a hierarchy of systems within which the farming system is one of a number of levels. ... One important consequence of the wider framework is the diversity of perspectives embraced.*

Complementary to this, Petheram and Clarke (1998, p103) identify FSR as a systems approach that can incorporate all types of inquiry, as considered appropriate by the participants, for example applied science (social, economic, biological), hard systems or even basic science. It is participatory, involves cycles of observation, diagnosis, planning, action and evaluation, and aims to
benefit farm families and/or communities by improving the performance of their farming systems. Similar views have been expressed by Norman and Collinson (1985), Anderson and Dillon (1985) and Remenyi and Coxhead (1985).

More recently Robinson (2003, p7) suggests *FSR is more a collection of methods and concepts than a discipline in itself*, which is comprised of at least six elements, including:

1.  *Systems research; studies of hierarchies, information and energy flows, etc.*
2.  *Farm management economics; begun by agronomists, farm advisors and other non-economic specialists who self-trained in economics.*
3.  *On-farm research in low-income countries.*
5.  *Adult learning.*
6.  *Participatory action and participatory research.*

The FSR tenet of participation by farmers with relevant stakeholders to advance agricultural development was present in PPP. This comprised the generally qualitative phenomena of farmer participation and adult learning within industry development processes. The PPPLT recognised the on-farm domain as a multi-layered and complex system influenced by a variety of factors in addition to the generally quantitative phenomena of biophysical input-output relationships. This stance reflected transformations within FSR since its inception, as observed by Robinson (2003, p7): … *During the 1980s and early 1990s, … [Farming Systems] proponents of the hard and soft schools differentiated their approaches, but it has been the integration of the methods of these schools [since the early 1990s] that has resulted in a more successful FSR.*

**Action Research and Extension**

Analysis of the experiences and results of PPP required an understanding of Action Research and Extension theory combined with an awareness of the diversity of methods available for application. Jennings and Packham (2003)
referred to the PPP approach as blending Action Research with agricultural extension as a form of project delivery. This is discussed further in Chapter 4.

The inter-disciplinary facet of Farming Systems Research provides the theoretical framework to the fusion of extension and action research within PPP (Figure 3).

Figure 3: Theory and practice in the Profitable Pastures Project.

1.2 The research question

Premise for research
When I joined PPP as the PhD candidate (February 1999), several sources (academics and industry officers) suggested that novelty lay in the fact that PPP would apply Action Research methods in a unique and explicit manner to the NSW dairy industry. The novel intent of PPP requires further qualification.
(provided in Chapter 4), but in essence the ownership of PPP, its learning and research activities and control of resources was, *a priori*, to reside with farmers.

PPP differentiated itself from most contemporary industry funded projects by rejecting a common approach of striving to do something for or to farmers by conducting pre-conceived research agendas and implementation strategies. Such projects generally deliver their results to farmers via a final project component of *add-on* extension work.

Other types of projects that, similar to PPP, claim to use participatory methods generally provide a mode of research that incorporates farmers, and their farms, into research strategies as *instruments*. Under these so called *participatory research* projects ordinary farmers are mostly excluded from the critical phase of agenda setting for the research, while the strategies for implementing the agenda items are similarly pre-determined (evidence of such projects within the Australian context is provided in Chapter 4).

This approach does not satisfy a PPP requirement of working *with* farmers as equal participants or *co-researchers* who are capable of valid input to the research agenda and throughout its implementation based on their own life experiences and knowledge (Jennings and Packham 2004, Greenwood and Levin 1998, p3).

PPP worked with farmers by inviting them to play a major role in determining PPP’s research priorities and strategies. Farmers personally developed the conceptual logic that supported why a particular research activity was of benefit to themselves and their industry. In this way PPP adopted and applied a critical principle of AR, that it *democratises research processes through the inclusion of the local stakeholders as coresearchers* (Greenwood and Levin 1998).

**Stating the research question**

In light of the premise for researching PPP, this thesis aims to provide insightful answers to the following question:
Primary, secondary and tertiary research tiers
The inter-dependence of PPP, farmers and this PhD research created a triple-nested-agenda, that developed research and learning on several levels, as depicted in Figure 4. At the Primary Research tier farmers in PPP were pursuing their individual and group agenda at a local level (on-farm), but this was simultaneously nested with the broader dairy industry agenda of productivity gain.

Figure 4: Research tiers of the Profitable Pastures Project.

Secondary tier research involved regional and state level learning through transferring local farmer results to other regions, but also through reflecting on and connecting the dynamic group processes of each Regional Dairy Group and farmer experiences. At this level dairying communities employed Action Research at the regional level in pursuit of an industry agenda, nested with their
individual on-farm agenda. Within this tier the research community, industry and farmers all work together to produce results of individual and collective benefit. For example, a PPP supported technical solution to an on-farm problem provides farmers with a greater capacity to manage their business; involved researchers benefit from technical learning or discovery of relevant research and results; and industry gains through improved farm productivity amongst the proportion of farmers who adopt the technology or benefit from the learning and/or research experience.

Tertiary Research, which encompassed PPILT research at the state level, involved pursuing the industry’s productivity together with meta-research of Action Research and Extension. Meta-research (in this sense) refers to the researching of conceptual constructs or theory not visible in the material world, such as Action Research and Extension. The effects of Action Research theory may be observable in the material world but the combined elements of the theory make up a conceptual construct that does not embody a physical form.

The PPILT’s meta-research of methodology and methods was acted on by this PhD research and oriented toward the development of Action Research and extension literature. The results of this research are nested with industry agenda because PPP is grounded in the application of theory to the real world context of NSW dairy communities. In essence PPP was deliberately designed as a project that focused on the value of learning about learning.

The three tiers of research identified in Figure 4 are used as a framework to discuss research arising from PPP. In particular, Chapter 5 pertains to the primary tier and discusses practical learnings about the application of Action Research with NSW dairy farmers; Chapter 6 pertains to the secondary tier and addresses technical matters of participation that stem from PPP’s farmer community activities and may be applicable (in future) by industry; while the tertiary tier pertains to Chapter 7 that comprises an historical investigation of extension and the fundamentals elements that led to its origination.
Research Boundaries

This thesis is a methodological evaluation of Action Research as deployed by PPP in the NSW dairy industry. The implications of PPP’s primary and secondary research experiences provided the basis of this thesis — to extend existing theoretical concepts and forms of Action Research and extension practice.

In addition, by considering all three tiers of PPP research (Figure 4), this thesis seeks to identify meaningful insights that benefit not only the NSW (and Australian) dairy industry at local, regional, state and even national levels, but also the methodological domains of Action Research and agricultural extension.

1.3 The PhD-PPP Relationship

PPP and this PhD were two separate projects within Dairy Australia’s Farm Management portfolio. As a student of UWS, I have not strictly relied on the performance of PPP for funding, or to complete this PhD. It should be clear that it was possible for this PhD thesis to criticise the methods, operations and outcomes of PPP, without in any way jeopardising the validity of either this thesis or the industry results achieved by PPP.

This thesis contributes to contemporary Action Research and extension methodology while PPP’s primary objective was to improve on-farm profitability through increased farmer participation in pasture management research, learning and development. In both cases PPP and this PhD thesis could reach their respective stated objectives by observing and interacting with the same agricultural context, but from differing perspectives and with differing outcomes. In fact, this research has investigated the origin of world extension dating back to 15th century Europe (Chapter 6), the results of which, although related, are not directly applicable within the NSW dairy industry.
Box 2 outlines the expected role of the PhD Student. Although the original proposal suggests that an evaluative component of PhD research was likely to be addressed by a second student, this element became central to this thesis.

**Box 2: PhD Position with the Profitable Pastures Project.**

The appointment of a postgraduate student at the commencement of the [PPP] will enable an evaluation of the survey and monitoring stages of the project, as well as survey design. The appointment of a postgraduate at the commencement of year three of the project will enable an evaluation of the on-farm research and extension stages of the project.

*(Dairy Australia 1996)*

**PPP Contributions to PhD**

The linkage between this PhD and PPP existed formally through the PhD candidate holding a position on the PPPLT (at least for the duration of candidature). Through this opportunity, during both Phase 1 and Phase 2 of PPP, I observed the project’s processes of decision-making, policy development and implementation from within PPP.

During Phase 2, I was simultaneously employed as the PPP Coordinator, and consequently was in an ideal position to observe the impact of PPP. As a continuous member of the PPPLT, I actively engaged in the decision-making and management processes that shaped the operation of PPP.

My dual positions on the PPPLT enabled me to contribute personal opinion and advice that fed directly and indirectly into the issues addressed by the PPPLT. Data for this PhD was derived from the opportunity to access real world experiences, as granted to me — as a student and project coordinator — by dairy farming families and their collaboration with the PPPLT.

**PhD Contributions to PPP**

As this PhD research progressed, I was increasingly able to engage with and inform the PPPLT of dynamic aspects of relevant theory and practice as they
emerged to me from interaction with the professionals and academics within the domains of Action Research and agricultural extension. My contributions to the PPPLT were concerned with updating definitions and development of relevant theory, methodology and their praxis within Action Research and extension circles, commonly with regard to application issues arising in PPP.

I provided a significant portion of my time, as student and coordinator, to facilitating PPP meetings that provided a regular and sustained interface with all the stakeholders related to PPP. In addition, my conference presentations on behalf of the PPPLT and (refereed) papers exposed the PPP methodology to both domestic and international audiences and enabled me to relay valuable feedback to the PPPLT on a range of issues, from new developments in relevant theory and practice to specific suggestions concerning the operation and management of PPP.

1.4 Thesis structure
This thesis begins with this introduction (Chapter 1) to the broad context within which PPP operated in the material world. Chapter 2 provides a review of methodologies relevant to PPP, while the method used for this thesis is outlined in Chapter 3. Chapter 4 details the PPP experience by utilising relevant qualitative and quantitative data to describe events that occurred in the field, as well as selected case studies for subsequent discussion. While grounded in the context of PPP outlined in the previous chapter, Chapter 5 embarks on research pertaining to Action Research, while Chapter 6 presents a similarly based theory of participation. In attempting to address issues arising from PPP, Chapter 7 explores the historical origin of extension and re-visits the traditional technology transfer model of extension. Chapter 8 discusses the implications of research presented in chapters 5-7, and concludes with a summary response of key findings pertaining to the original research question *(Does Action Research provide an effective methodology and method(s) for enacting farmer-driven research?)*.

Each *Box* in this thesis contains factual information from primary documents and data generated by PPP. These include: the original project proposal submitted to
Dairy Australia; Regional Dairy Group and farmers’ data, such as meeting minutes or research data; industry brochures on PPP; my personal journalised diary data; and notes from PPP activities at all three tiers of research.
Chapter 2 — Methodology Review

You’ve got the complex things, you’re trying to make some judgement about them, and in the end you’ve got to use your own sense of values and understanding to make your own judgement.

Charles Birch (2001)

2.1 Choosing qualitative methodology

This chapter reviews the fundamental methodologies that guided this research and the PPPLT, where methodology is accepted as a set of theoretical ideas that justify the use of a particular method or methods (Midgley 2000, p112).

A pluralistic and qualitative methodology provided a suitable frame of reference for conducting empirical research in the NSW dairy industry, with the specific methodologies of Action Research and Extension being embraced by the PPPLT and for conducting this research. The corresponding methods used for this research are detailed in Chapter 3 while those used to conduct PPP are presented
in Chapter 4. Figure 5 provides a schematic diagram of the purpose of methodology and methods for both this research and the PPPLT.

**Figure 5: Methodologies, methods and their application.**

**Methodological choice for this research**
The justification for employing one methodology over another depends upon the context of the research being undertaken, and in this instance PPP called for a
primarily qualitative approach because its dominant mode of engagement with the research domain was observational and participatory, with a wide ranging involvement of people and organisations. Contrasting the definition of qualitative research with that of quantitative research helps clarify the reasons why employing a qualitative methodology was appropriate.

**Qualitative Research**: is concerned with describing patterns of behaviour and processes of interaction as well as revealing the meanings, values and intentions of a person’s life experience. Data collection is based on an interpretative (power sharing) model, it is creative and idiosyncratic and utilises the techniques of interviewing, observation and document analysis which are informed by various theoretical perspectives (Grbich 2000, p3).

**Quantitative Research**: is concerned with measuring the magnitude, size or extent of a phenomenon. Data collection derives from a scientific, positivist cause-effect model, characterised by researcher control, constraints, formal rules of procedure and verification, and standardised statistical formats based on probability theory and other theories from classical physics and mathematics. Prediction and generalisation are the desired outcome of this technique (Grbich 2000, p3).

As a state-wide project, PPP did not lend itself to establishing classes of quantifiable variables that were measurable in terms of magnitude, weight, size, depth, height, speed etc, other than to consider industry-wide statistics that provide a measure of averaged characteristics, such as farm financial and physical information or farmer education. However, at the local level of PPP, farmers mostly conducted projects suited to the rigors of quantification, and, to a minimal extent, the PPPLT analysed statistical data and incorporated it where relevant to solidify and enrich the understanding of the research context (NSW dairy industry) and its participants (farmers and other stakeholders).

Both PPP and this thesis held dairy farmers, and their families, as the key stakeholder of interest. This focus requires a qualitative methodological framework for purposes of observing, interacting with, recording and analysing individual and collective human behavior. The institutional, industry and societal environment within which farmers operated at local, regional, state and even national levels was best understood using qualitative appraisals to interpret farmers’ behavior, and their interaction with PPP stakeholders such as government advisory staff, scientists, agribusiness, and others.
The PPPLT oversaw Regional Dairy Group activities of local learning and research, which mostly were founded on the traditions of quantitative inquiry. Farmers and their local advisors sought to investigate their research agenda by applying quantitative methods, such as controlled experiments involving physical measurement of tangible variables that were underpinned by positivist assumptions. Examples included soil analyses, fertiliser trials, nutrient budgeting, pasture species trials etc.

Consequently, it has been essential for the PPPLT — myself included — to accommodate quantitative methodology and accept its validity for meeting the needs and wants of participating farmers. The PPPLT necessarily embraced a mixed methodological approach that welcomed both qualitative and quantitative information and analysis to improve the situation of farmers and their industry.

The case for methodological plurality
PPP was conceived and created by a range of people and their organisations (for details see Chapter 4). On an instinctual level it was logical that the approach taken to researching the experiences of PPP be of a plurastic, inclusive and collaborative nature. Beyond instincts, though, exist intelligible arguments for adopting a pluralist methodological approach. Midgley (2000) argues that methodological pluralism is justified on at least three counts.

Avoiding marginalisation of stakeholders. Firstly, adopting a singular methodology can marginalise stakeholders (within a research or organisational project) who do not uphold the selected methodology. By way of example, Midgley (2000) suggests that environmentalists are unlikely to wholly agree with a cost-benefit framework for allocating natural resources, and their disagreement would marginalise their voice, potentially to the point of silence if the project proceeded based solely on the precepts of a single (economic) methodology.

Accommodating unforseen events. Second, the strict adherence to one
methodology that is deemed appropriate at the start of a project may lock participants into a set of assumptions that are no longer relevant as the life of the project unfolds. By adopting a plural approach researchers are signalling their willingness and openness to accommodate unforeseen events that may require an adjustment or switch in methodology. Methodological pluralism provides a type of insurance against major changes in project dynamics, such as a reversal in participant values, external shocks, or simply unpredicted results and outcomes.

**Researcher bias.** Third, and perhaps most relevant to this research, is that methodological singularity can itself taint researcher behaviour. Adopting one methodology can lead to bias within a researcher’s actions — regardless of whether it is conscious or unconscious. A researcher with only one set of theoretical ideas and related tools for observing, interpreting, intervening, discussing, analysing and concluding is exposed to the risk of being naively unaware of alternative understandings, interpretations and findings.

Based on both instinctive and intellectual reasons (above), and the qualitative nature of the research domain, the methodological framework of this thesis is undoubtedly pluralistic, and hence open to differing methodological approaches. An array of methodologies was considered for inclusion in this research, and although qualitative approaches are granted a higher level of appropriateness to achieve the tasks at hand, there is no presupposition that others (quantitative approaches) are invalid because they are considered less appropriate for the current context.

### 2.1.1 Foundations of qualitative methodology

The validity of qualitative methodology has been established through volumes of research that are now, with hindsight, considered to constitute historic developmental movements.

**The path to legitimacy pre-1965**

Prior to 1965 anthropology provided a driving force of practiced qualitative
research, principally through the use of ethnography and studies involving participant observation, often based on longitudinal time frames. Combining the researcher with the researched, through interaction with the real world, constructs outcomes that can be interpreted and analysed to create knowledge and meaning. Through this relationship ethnographers define the truth of their reality as constructed.

Ethnography has undergone its own methodological transformations, with its origins stemming from descriptive reports by early European ethnologists who met with indigenous peoples following explorations and acts of colonisation. Comte (cited in Vidich and Lyman 2000) devised the Comparative Method, which was a Eurocentric framework that divided a community’s cultural attributes into discrete stages of development, enabling the ethnographer to define and categorise peoples on a spectrum of cultural evolution relative to that of Western Europe.

**Qualitative methodology post-1965**

After 1965 qualitative methodology experienced significant diversification. Of primary concern was debate over the researcher’s position within the research process. Major issues emerged about the extent to which researchers could justify personal involvement with the research context and still obtain meaningful results from generated data. Did structures of power exist that could bias or influence data, such as patriarchal structures and expectations? What vantage point on the spectrum ranging from no involvement to full-time active participation was an acceptable location for researchers to gather data, and how did their degree of involvement influence data integrity and the interpretation of results (Vidich and Lyman 2000)?

The constructivist approach to these issues contrasted with the prevailing science-based and quantitative paradigm, which espoused truth as being independent of researchers and that the truth could be revealed or discovered (Grbich 2000).
**Postmodernism and deconstruction**

More recently qualitative methodology grappled with a range of complexities broadly encapsulated within the influences of Postmodernism. These include: the abandonment of grand narratives, generalisation or any construction of universal truths; the re-assessment of values and ethics as particular to localised circumstances, which hold only temporary validity through their links to specific cultural moments; and a view of history as a compilation of one observer’s value-laden assessment of facts, in which power and power relations are not represented by universal doctrines, but rather are disseminated through a complex array of cultural dynamics (Vidich and Lyman 2000).

The impact of Derrida’s concept and presentation of *deconstruction* challenged professional ethnographers to re-consider their status by thinking of their writing as the product of *an unacculturated stranger who is guided by whatever the uneasy mix of poetry and politics gives to his or her efforts to comprehend an alien culture* (Denzin and Lincoln cited in Vidich and Lyman 2000, p60). This Postmodern epistemology is problematic for ethnographers in terms of the practitioner’s ability to represent reality, and identify and explain social action or change.

In response, Denzin (cited in Vidich and Lyman 2000, p61) suggests that contemporary ethnographers should …

*immerse themselves in the lives of their subjects and, after achieving a deep understanding of these through rigorous effort, produce a contextualised reproduction and interpretation of the stories told by the subject. Ultimately, an ethnographic report will present an integrated synthesis of experience and theory. The “final interpretative theory” is multivoiced and dialogical. It builds on native interpretations and in fact simply articulates what is implicit in those interpretations.*

These suggestions for ethnographer behavior resonate within the method selected and conducted for this thesis (see Chapter 3).

**Current legitimacy of qualitative methodology**

Qualitative methodology has not always enjoyed a credible reputation,
particularly prior to the 1960s. Indeed Denzin and Lincoln (2000) present a section of their exhaustive text titled *Resistance to Qualitative Studies*, followed by *Qualitative Versus Quantitative Research*. The content of the former of these sections identifies the friction between both camps, explaining that *qualitative researchers are called journalists, or soft scientists. Their work is termed unscientific, or only exploratory, or subjective. It is called criticism and not theory, or it is interpreted politically, as a disguised version of Marxism or secular humanism* (Denzin and Lincoln 2000, p7).

These criticisms no longer hold as much sway and it can reasonably be argued that qualitative methodology is considered legitimate in its own right by academia, government and industry. Within contemporary times it appears qualitative methodology is generally accepted as having sound paradigmatic credentials for delivering research, analysis and results of significance.

### 2.1.2 Qualitative methodology in Australian agriculture

Qualitative methodology appears to be rising in status within Australian agriculture, as evidenced by an increase in the application of qualitative research methods within agricultural development projects. Agricultural sectors that have run projects with a qualitative approach, and are supported by government and industry research agencies (mainly Research and Development Corporations), include dairy, grains, meat and livestock, horticulture and an umbrella group of rural industry projects (Rural Industries Research and Development Corporation).

Not only have research and development programs explicitly adopted participatory methods, but many implicitly incorporate key principles from a range of qualitative approaches (such as Action Research) into their project structures (Blackburn, 2000; Dairy Australia, 1999 and 2003; DIDCO, 1999; DNRE, 2002; Clarke and Timms, 2001; Eastough, 2001; Evans et al, 2003; Gahan et al, 2001; Irvine, 2002; Macadam, 1997; Mason, 2001; Roberts et al, 2003).

PPP coincided with a period in which Australian extension and the Farming
Systems Research movement, arguably, increased their profile. For example, the
Australasian Pacific Extension Network (APEN) has continued to grow in
membership since 1994, while the Australian Farming Systems Association
(AFSA) came into being in 2003 and was well supported at its first conference
forum. In addition, APEN in 2004 has embarked on a National Extension Policy
Summit, aimed at further increasing the role and resources dedicated to extension
professionals within Australian agriculture. Although APEN and AFSA are
relatively young organisations, their emergence onto the Australian agricultural
scene indicates widespread support for their charters. This is evidenced by their
critical mass of members and institutional supporters.

In general, qualitative and participatory approaches appear to have enjoyed an
increased popularity in sectors of agriculture, although this proportion remains
relatively small compared to the resources dedicated to traditional scientific
research, quantitative inquiry and extension processes.

2.2 Theory-generating versus theory-directed research
Quantitative research necessarily tests existing theory through empirical processes
(theory-directed), while qualitative research has potential to generate theory
through experience and analysis that are not directed by a priori expectations
founded on established theory or known facts.

Theory-generating research does not require existing theory or established and
reliable knowledge to engage with its research domain, and characteristically
explores areas about which little is known or documented in depth. Action
Research comes under the category of theory-generating research, along with
various other forms including ethnography, phenomenology, grounded theory,
types of historical research and evaluation research (Grbich 2000).

The linkage between Action Research and the Grounded Theory movement,
initiated by Glaser and Strauss (1967), is encapsulated by Zuber-Skerrit’s (1996a.
p5), claim that Action Research becomes emancipatory when it ...
aims at the participants’ empowerment and self-confidence about their ability to create ‘grounded theory’, i.e. theory grounded in experience and practice, by solving complex problems in totally new situations, collaboratively as a team or ‘community of scholars’, everyone being a ‘personal scientist’, contributing in different ways, but on an equal footing with everyone else.

Consequent to the distinctions between theory-directed or theory-generating research, this thesis utilises a theory-generating research process.

2.3 Action Research as methodology

2.3.1 Foundations of Action Research

Greenwood and Levin (1998) outline the movements preceding the development of Action Research as being General Systems Theory (GST) during the 1920s, followed by pragmatism and neopragmatism. GST is founded on the belief that the world is holistic in its organisation of interlinking organic, inorganic and sociocultural systems. These elements combine to create processes that are systemic and interrelated, as opposed to autonomous, independent structures made up of particulate matter through which complex combinations produce the way in which the world evolves and manifests itself.

In a similar vein, Midgley (2000, p118) recognises the advent of Action Research as a reaction against the commitment of Popper and others to scientific orthodoxy of the 1930s that was built on previous philosophies of science that ... placed independent observation at the centre of scientific practice. This methodology was essentially rejected by early Action Research practitioners in favour of harnessing ... science in the service of intervention rather than observation with a clear desire to utilise science and its products to the benefit of society (Midgley 2000).

The Action Research movement adopted this holistic view from General Systems Theory, and operated upon an assumption that Action Research methods can explore and open up the systems and sub-systems that comprise the world as it appears to practitioners, such as by democratising social processes.
The other precursors to Action Research were pragmatism and neo-pragmatism, which are described by Dewey (cited in Greenwood and Levin 1998, p73), who believed that:

...everything is forged in action. [Dewey] sees democracy itself as an ongoing form of social action, a combination of institutional forms and ethical commitments that work toward the increasing ability of all members of society to contribute to their intelligence to the whole. He believes that the only real sources of knowledge are to be found in action, not in armchair speculation ...[and] all knowledge testing and proofs are experimental activities.

The origin of Action Research: Moreno nicht Lewin
As is well documented, the origins of Action Research are traceable to social experimental research conducted by Kurt Lewin in the 1940s. Although Lewin holds the most prominent position within the literature, a German colleague J. L. Moreno may have been the first to introduce terms such as interaction research and action research. Petzold (1980) and Gunz (1986) suggest that Moreno was the first to insist on principles like field-based research, and improvement of social situations as an aim of research (Petzold cited in Altrichter and Gstettner 1997, p48). As early as 1913 Moreno conducted work with participants as co-researchers, who in this case were prostitutes from Viennese suburbs.

Given Moreno and Lewin personally knew each other, there is a case to argue that Moreno influenced Lewin’s development of Action Research. Gunz (1986) explains that Moreno complimented Lewin’s personality and motivation for Action Research by being the committed actionist filled with intuition and charisma, ... [while] Lewin [was] the reserved social researcher of traditional style interested in logics and precision but on the brink of a paradigm change (cited in Altrichter and Gstettner 1997, p48).

Lewin’s construction of Action Research
Despite Moreno’s precedence, Lewin is credited with coining the phrase Action Research, although its meaning has been transformed since inception. Lewin
constructed his version of Action Research by combining two mutually exclusive methodologies and amalgamating their associated methods through experimentation. Lewin mixed quantitative scientific method with the comparatively new theory of Human Relations, principally developed by Myers (Midgley 2000) during the 1920s.

By acknowledging participants in an experiment as agents of change, Lewin was incorporating the values of Human Relations theory. This theory sought to understand and promote the role of the individual over the pursuit of objectified technical process management, which stemmed from reductionist science and management theory.

Lewin created social experiments that maintained the control and authoritative elements of conventional science, but departed from the quantitative tradition by aiming to generate pre-determined social outcomes. These outcomes were dependant on building the capacity and self-actualisation of research participants.

From his experiments, Lewin (1952) deduced that social change occurred discretely, in a three tiered sequence of 1) unfreezing, 2) changing, and 3) freezing, or locking in social change (cited in Kemmis and McTaggart 1998). This view no longer holds sway in contemporary Action Research theory, which now acknowledges the continuous nature of social processes and change over the existence of stable social states (Greenwood and Levin 1998).

2.3.2 Derivatives of Action Research

Action Research or Action Learning?

Contemporary to Lewin, and attributed with having coined the term Action Learning (AL), Reg Revens developed ways to resolve production and operation inefficiencies in commercial industry. Revens’ approach differed from Lewin’s, not so much in achieving pre-determined outcomes, but in designing participatory processes to improve peoples’ ability to learn how to learn. This was done by instituting a series of agenda-specific meetings with all the stakeholders.
responsible for problem-solving being present.

Importantly, Revens identified people who were usually considered external independent experts to be part of the initial problem being flagged for resolution and improvement. The equalisation of power relations amongst group participants is central to contemporary Action Research and Action Learning methodology and its derivatives.

Lewin and Revens advocated subtly different processes for taking action in research. Participatory action was central to both, but for Lewin the process was considered to be oriented towards research in the traditional, Positivist sense that could reveal new knowledge or discover a greater understanding of social structures and their dynamics, while for Revens the process was geared toward localised learning outcomes, particularly for the participants as individuals and as a collective.

**Differentiating Action Learning from Action Research**

Within relevant literature there exists a plethora of definitions and derivatives of what Action Research has been, currently is, or should be. I concur with Greenwood and Levin’s (1998) view that Action Research does not constitute a discipline that is taught, practiced and developed through formal teaching and as such needs to present itself to the world in more accessible, consistent, coherent and structured ways. Compounding the difficulty of defining Action Research is the exposition of countless case studies based on practitioner experiences, through books, journals, workshops and conferences that offer potentially transferable recommendations or new knowledge, amendments to practice or points to consider when engaging Action Research methods. Such expositions seldom relate field experience back to Action Research methodology or specific methods, which in turn are not presented in any comprehensive or standardised form across the literature.

Jennings and Packham (2004, p2) commented on the difficulties faced by the
PPPLT as it grappled with a consensual definition of what Action Research was, based on the knowledge of experienced professionals and existing literature:


Given the seemingly infinite number of ways to encounter Action Research, the following two sub-sections chart the methodological characteristics of Action Research that are relevant to the PPP experience and this research. In particular, Participatory Action Research is presented as a central set of principles that guided both the PPPLT and my personal intervention in the NSW dairy industry, while Emancipatory Action Research is explored, in preference to Practical and Technical forms.

**Subsequent terminology for the umbrella of Action Research**

The above exposition of Action Research as opposed to Action Learning make it difficult, if not impossible, to accurately refer to specific types of Action Research using the umbrella term Action Research. In particular, Action Research is not identical to Action Learning, and hence the former should not be used to approximate the latter. In addition the term Action Research is equally applied to describe both methodology and method – a major distinction that is seldom clarified in existing literature.

Given the potential for confusion in distinguishing between Action Learning or Action Research-based approaches, from this point onwards I have replaced the umbrella term of Action Research with the joined phrase of Action Learning and/or Action Research, expressed as AL/AR. The acronym AL/AR should be taken to mean, relate to, or refer to either or both Action Learning and Action Research processes. I have endeavoured to be clear when this term pertains to
methodology or method, and where possible to varying types of AL/AR
processes, such as Participatory AL/AR, Emancipatory AL/AR, Practical AL/AR,
and Technical AL/AR.

2.3.3 Participatory Action Learning / Action Research
Grundy and Kemmis (1981) suggest that the participatory and collaborative
nature of Action Research stems from the group dynamics movement in America
in the 1940s, since formalised as Participatory Action Learning / Action Research
(Participatory AL/AR). Participatory AL/AR goes beyond the standard form of
Action Learning or Action Research to the extent that it requires participants be a
part of the premise for taking action.

Grundy (1997) acknowledges the need for a shared understanding of
‘participation’ and embraces the Mc Taggart (1989) definition of Participatory
AL/AR that differentiate it from kinds of research which typically involve
researchers from the academy doing research on people ... [Participatory action
research / action learning] engages people from the academy and the work-place
in an entirely different relationship ... (they) are joined by a thematic concern – a
commitment to inform and improve a particular practice (McTaggart cited in
Grundy 1997, p127).

In support of this approach, McTaggart (1997) identifies three basic principles
that constitute authentic participation, which as derived by Tandon (1988) are:

- people’s role in setting the agenda of the inquiry,
- people’s participation in the data collection and analysis, and
- people’s control over the use of outcomes and the whole process.

McTaggart (cited in Grundy 1997, p127) explicitly differentiates Participatory
AL/AR from other kinds of research, which presumably includes a standard or
fundamentally basic definition of AL/AR — the meaning of which is not clear,
other than to assume that standard AL/AR lacks the properties implied by the
participatory elements of Participatory AL/AR. By extrapolation, standard
AL/AR accepts that leaders of research are justified in recruiting participants to join projects that have a pre-determined agenda and strategy for pursuing situation improvement. Standard AL/AR permits the leader or leaders to direct their project and hence their participants, even to the extent that individual participants are divorced from their own personal agenda.

An important distinction is raised by the differentiation between AL/AR and Participatory AL/AR. In the former, a participant is considered necessary for a project to be conducted, but the participant is constrained to contribute in ways that suit the leader’s agenda. The participant’s full capacity for contribution is not permitted, unless required by the lead agent.

In the latter (Participatory AL/AR), the participant’s behaviour is delimited because it is entirely unrestricted and governed by the individual, not by the lead agent (although each participant will be influenced by the lead agent and other participants). The distinction between standard AL/AR and Participatory AL/AR can be expressed as an (hypothetical) example: a leading Action Research scientist can initiate the agenda for a project that requires external participants to conduct the research, but given the opportunity to initiate a project agenda the same participants would likely express different research priorities and strategies.

Participatory Action Research / Action Learning does not allow disconnection between those who create and plan research agendas and actual participants who conduct the research by implementing its strategies, and who are intended to benefit from the results of the research. Participants must be the originators of an agreed agenda that has been established through communal dialogue, which is then addressed by some form of interventionist action (Chein et al. 1948).

Based on McTaggart’s view, for any project to be deemed Participatory AL/AR, each participating member must endeavor to:

- improve his or her own work,
• collaborate with others engaged in the project ... to help them improve their work,
• collaborate with others in their own separate institutional and cultural contexts to create the possibility of more broadly informing the common project, as well as to create the material and political conditions necessary to sustain the common project and its work (McTaggart cited in Grundy 1997, p127).

In addition, Participatory AL/AR is concerned simultaneously with changing individuals, on the one hand, and, on the other, the culture of the groups, institutions and societies to which they belong (Grundy 1997). Chein et al. (1948) support Midgley’s (2000, p199) view that Participatory AL/AR must involve participants from the very beginning in the design and execution of the research, and this participation should continue to the very end with the production of conclusions and implementation of recommendations.

Based on this, Participatory AL/AR is linked to liberational movements such as Feminism, as well as the lifting of socio-economic oppression characterised by poverty (Greenwood and Levin 1998; Kemmis and McTaggart 2000).

2.3.4 Three Modes of Action Learning / Action Research
In general, AL/AR maintains a sharp focus on the dynamics of power and equality amongst participants, and their interaction within organisations to build a better, freer society (Greenwood and Levin 1998, p3). This noble ambition is simply stated, but in reality invokes a complex range of philosophical, socio-economic and political beliefs that underpin a variety of means to this end.

Emancipatory Action Learning / Action Research
Grundy (1982) defines Emancipatory AL/AR, relative to that of Technical AL/AR and Practical AL/AR. A founding assumption for these three definitions is that people are restricted in various ways, which limits their freedom and opportunity. Although Grundy is referring to a classroom education context, her exposition of the three modes of AL/AR is invaluable as a guide for observing and directing PPP, based on a coherent understanding of where PPP was located on the spectrum of AL/AR modes.
Grundy (cited in McTaggart 1988, p358) suggests that Emancipatory AL/AR is appropriate in:

"areas where institutional restrictions impinge upon educational practice so that the individual or group, while operating prudently and professionally to initiate change, is powerless to do so because of the strength of ‘the system’ (‘the system’ may represent an organisation or administrative structure or a theoretical structure such as a language or learning theory). .... While [the general orientation of Emancipatory AL/AR] will still be toward the fostering of prudent, professional practice, it also has as its purpose the emancipation of participants in the action from the dictates of compulsions of traditions, precedent, habit, coercion, as well as from self-deception. In this [way Emancipatory AL/AR] focuses not only upon particular practice, but also the theoretical and organisational structures and social relations which support it."

Grundy’s appreciation of Emancipatory AL/AR is echoed by other commentators, such as Tripp (1984) who considers it (Emancipatory AL/AR) to be the activity of a self-leading group, aimed at developing new practices and/or changing the constraints, with a shared radical consciousness and problematised values (cited in McTaggart 1991, p30); and Zuber-Skerrit (1996, p5) who asserts that Emancipatory AL/AR encompasses the aims of both Technical and Practical AL/AR (defined below) but also [aims] at changing the system itself or those conditions which impede desired improvement in the system/organisation.

**Practical Action Learning / Action Research**

By way of contrast, Practical AL/AR does not seek to critically examine the power relations of participants and redress imbalances where appropriate; rather it promotes good practice or pragmatic solutions that need not necessarily be technically correct practice. Action requires a degree of moral judgement when participants consider the extent of variation from correct or orthodox practice in order to meet their individual and collective objectives (Grundy 1982).

In this mode (Practical AL/AR), participants are unrestricted in their behaviour but this occurs within the confines of a project agenda that is jointly constructed and governed with external agents and their belief system. Practical AL/AR results must also be shared amongst the participants and the project initiators. By contrast, Emancipatory AL/AR participants are entirely the core agents who
benefit from results, be it materially or emotionally, from the research process.

**Technical Action Learning / Action Research**

At the other extreme, Technical AL/AR is oriented toward achieving a strictly technical outcome. Under these conditions participants are treated as instruments, and are *not* permitted to contribute moral judgement or make project contributions that stray from the original and wholly pre-determined technical research agenda. Technical AL/AR participants are commonly employed in the service of a project leader who defines the agenda in isolation from project participants, as well as its strategies for implementation and the use(s) of results (Grundy 1982).

Tripp (1984 cited in McTaggart 1991, p27) distinguishes Technical AL/AR by suggesting it is more commonly used to improve existing practice than create new ones. It (Technical AL/AR) can be individual or group-based (as can Emancipatory and Practical forms of AL/AR) but a key defining characteristic is that it is *other-directed,...[and occurs] within existing consciousness and values with an unproblematised view of constraints.*

Figure 6 reproduces Zuber-Skerrit’s (1996a) summary of the relative characteristics of Emancipatory, Practical and Technical modes of AL/AR.
Figure 6: Types of action research and their main characteristics

<table>
<thead>
<tr>
<th>Mode of Action Research</th>
<th>Aims</th>
<th>Facilitator’s Role</th>
<th>Relationship between facilitator and participants</th>
</tr>
</thead>
<tbody>
<tr>
<td>2. Practical</td>
<td>As (1) above. Practitioners’ understanding. Transformation of their consciousness.</td>
<td>Socratic role, encouraging participation and self reflection.</td>
<td>Cooperation (process consultancy)</td>
</tr>
<tr>
<td>3. Emancipatory</td>
<td>As (2) above. Participants’ emancipation from the dictates of tradition, self-deception, coercion. Their critique of bureaucratic systematisation. Transformation of the organisation and of the educational system.</td>
<td>Process moderator (responsibility shared equally by participants)</td>
<td>Collaboration</td>
</tr>
</tbody>
</table>

(Zuber-Skerrit 1996a)

2.4 Extension as methodology

2.4.1 Foundations of Extension: Transfer of Technology

The traditional Technology Transfer model of extension originated from a perceived need to educate farmers about scientific discoveries and innovations that are transferable on-farm. Education in this sense refers primarily to the delivery of (new) information (to farmers). The Technology Transfer model assumes that the extension of new information to innovative farmers is sufficient to facilitate adoption amongst this class of farmer, who lead the remaining farmers in adopting new technology (Black 2000).

The role of education in this linear model is to transfer new knowledge from the
domain of scientific research and technological development to the entire farming community, via the innovative producer. The skeletal theory of this model is commonly expressed as the following flow chart (Russell et al. 1989):

\[ \text{research} \rightarrow \text{knowledge} \rightarrow \text{transfer} \rightarrow \text{adoption} \rightarrow \text{diffusion}. \]

**Rogers’ economic theory of adoption and diffusion**

The expected pattern of adoption for any new technology or management practice depends on various factors. Under the Technology Transfer model, the optimal level of information necessary for a farmer to make a decision to adopt is a function of the farmer’s experience and knowledge, education, age, information gathering costs and learning processes. Observing the performance of new technology, and its impact (including potential profitability and cost), are critical factors underpinning a farmer’s decision to adopt or not (Saha et al. 1994).

Complex information-processing dynamics emerge in the period between a farmer’s awareness of a new technology and his or her decision to adopt, not adopt or defer the decision. Deciding to adopt a new technology rests with the intrinsic characteristics of the farmer, the physical circumstances of the farm, and the technology. Also relevant is the availability of technology-specific information and the path of information processing taken by the farmer (Jabber et al. 1998). For example, in the initial stage of the release of a new technology to industry there may be only a low level of technology-specific information available; alternatively, there may be high levels of information on offer but low levels of realisation and digestion of that information amongst farmers.

Rogers describes this *innovation-decision process* as consisting of five main components: knowledge, persuasion, decision, implementation and confirmation (Rogers 1983). The collective process of individual farmers adopting new technology is commonly referred to as diffusion. One method used to track diffusion across an industry for each new technology or management practice is to assume adoption follows a sigmoid logistic curve, to which Rogers fitted a
statically normal distribution divided into categories of adopters (Figure 7).

The first class of adopters of technology, as defined by Rogers (1962), are referred to as innovators, who are venturesome and eager to try out new ideas; they have cosmopolitan relationships and sufficient financial resources to bear any losses that may occur from time to time. Farmers in the second group to adopt new technology are called early adopters who are considered to be an integrated part of their social community and tend to act as opinion leaders. The third and fourth groups are the early majority and the late majority, who respectively, tend to be deliberate in their actions and are always skeptical about an innovation. The last group of farmers to adopt a new technology is classed as laggards, and members of this group are highly localised and traditional (Norris and Vaizey 1973, cited in Stoneman 1983, p96).
2.4.2 The diaspora of modern extension

As with AL/AR, there are many definitions and differentiated meanings for extension in the literature. This research is primarily concerned with the methodological union of AL/AR with extension, about which Jennings and Packham (2004, p2) stated that:


Since the 1960s a number of developmental strands of extension emerged beyond the traditional model, as outlined by Black (2000, p495) into a list of no less than 32 differently named participatory approaches. Race and Buchy (1999) similarly note a level of ambiguity that exists over the definition and meaning of ‘participation’ and related terms regarding community engagement applied within
forestry. What was initially a trickle of alternative approaches is now, in the new millennium, a flood of competing concepts, disciplines, theories and methodologies of extension as a discipline.

**Roots of departure from Technology Transfer**

The earliest Australian examples of departure from the traditional extension model include the pioneering work of Joan Tully and D. B. Williams in the 1960s.

In 1967 Tully presented a paper to the Australian Agricultural Extension Conference titled *The Farm as a Complex System: The Implications for Extension*. This paper was unlike most at the conference because it focused on the position of the farmer within on-farm decision-making, and attempted to identify the complexity of barriers to adoption by defining farms as *systems* in their own right. Tully (1967, 1(b)3) provided the following.

> *Our technical research men are specialists, who from their research, produce discrete pieces of information about parts of the ecological system. Extension then disseminates these discrete pieces of information to farmers. The farmer is given the very difficult job of fitting these discrete pieces of information into the very complex ecological system that is a farm .... If this problem of introducing change into a very complex ecological system has proved too difficult for research scientists, it is little wonder that farmers and extension men find it difficult.*

> *Any farming system consists of at least six different, complex, and dynamic sub-systems all interacting with each other and all interdependent. Some of these subsystems are more under man’s control than others. The manageable factors are climate, soils, plants, animals, economics, and man himself with his managerial skills, value systems, beliefs, and attitudes.*

> *Any change, either voluntary or involuntary, in such a complex system of interrelated variables sets off a chain-reaction throughout the system. Some may be desirable and others most undesirable. Some will be immediate, others long-term and cumulative, such as that produced by a crop-fallow rotation in low rainfall areas.*

Tully’s second paper at the 1967 conference, titled *The Principle of Relevance: Implications for Extension*, drew out the importance of extensionists’ understanding of farmers and their *different frames of reference* (Tully 1967a, p1(b)10). Again Tully approached the adoption decision from the farmer’s perspective, emphasising several ways in which a farmer must perceive technology as relevant on a range of measures before utilising it. Tully’s approach could perhaps be considered the farmer’s side of the Technology Transfer coin.
because she recognised the difficult conditions under which individual farmers made adoption decisions.

Although not wholly or explicitly rejecting Rogers’ technology transfer theory of diffusion, Tully questioned some of its traits and strongly promoted farmer-centric approaches for conducting effective extension. For Tully, the socio-economic context within which extension occurred was crucial, with the farmer and his/her immediate family being the central focus, rather than the attributes of the technology being disseminated by one-way communication (down to farmers). As early as 1953 Tully presented a report to government that boldly challenged her officious, high-ranking and (presumably) male-dominated and non-farmer audience:

>You as directors of agriculture probably visit the more progressive farms in your States ... [and] you will probably agree that, on these progressive farms, living conditions are fairly good and the people, including the wife and family, are keenly interested in improving their farming and productivity. On the way to these farms you will all have passed many that are not so progressive and will have seen the typical 2 or 4 roomed house with a verandah front and back and a single tank for a water supply, no paint, no trees, no garden, naked under the blazing sun[,] ... a battered utility in the shade of the house, an untidy woodpile, ... a little house about a chain away, a few dejected fowls scratching round and a few grubby children. ... [These are our] rural slums. Could you be an alert and progressive farmer under these living conditions? Would your wife be a happy, energetic and enthusiastic partner in such a farming enterprise? (Tully 1953, p1).

Tully powerfully linked farmer’s social and economic context to the determinants of diffusion and hence agricultural productivity. Through personal application and research, Tully used group-based techniques to improve extension communication systems in Australia, with such concepts as the Membership Reference Group, the Socialisation Process, and Group Control (Tully 1966).

Tully’s work implied a rejection of extension education based purely on one-way information delivery, and at a fundamental level departed from the accepted norms of positivism. Tully’s form of extension introduced the practice of multi-directional communication flows to and from farmers, which implicitly raised the status accorded to farmers to be closer to that of scientists, technologists, extension officers, government officials, agronomists and the like.
Prior to Tully’s contribution to extension, a farmer’s life experience and understanding, now often referred to as *indigenous knowledge* (Sillitoe 2004), were commonly overlooked as valuable to changing farming practice, with *expertise* and *expert knowledge* taking precedence. It appears reasonable to suggest that the early beginnings of an Australian-based, constructivist approach to extension methodology, based on the importance of farmer’s personally constructed reality, was present in Tully’s conception of extension.

Importantly, Tully recognised that farmers were not the sole barrier to technology adoption and hence agricultural productivity, but that all stakeholders, including extension officers, shared the responsibility of improving farm sector performance. In one reference group experience Tully reported that extension students were also beneficiaries who *changed their attitudes toward helping farmers with their problems just as radically as the farmers ... changed their attitudes toward the use of improved pastures* (Tully 1966, p152).

**Limitations of Technology Transfer**

In a similar spirit to Tully’s (above) perspectives on extension, Röling (1988) provided a formal evaluation of the Technology Transfer model. Röling’s critique pointed to a range of issues that called into question the validity of applying conventional diffusion of innovations theory, including:

- the frequency of non-homogeneous populations (of farmers);
- imperfect differential rewards (mainly financial) across different classes of farmers that can lead self-reinforcement of the Technology Transfer process;
- distortions in information availability to farmers;
- bias in favour of more progressive farmers within technology development;
- negative consequential effects, including increased economic rationalisation and hence decline of farming populations, lower commodity prices relative to those of industrial products, and productivity gains by farmers being extracted by supply chain stakeholders; and
• using farmer *innovativeness* as a variable to classify types of farmers.

Similar or concurring limitations are documented by Dunn (1997), Black (2000) and others. These issues were arguably the final nail in the coffin of the long standing supremacy of the Technology Transfer model of extension, although alternative approaches had begun to emerge at least a decade earlier.

**Farmer-First and the constructivist paradigm**

By the late 1970s confidence in traditional extension was waning for some extension professionals, leading to conditions in Australia that were sufficient to develop and implement alternative extension approaches. The most dominant and recognised paradigm shift to emerge was the *farmer-first* approach (Chambers et al (1989), Chambers (1997)), This approach no longer upheld the traditional assumption that farmers’ were to blame for non-adooption of innovations, instead pointing to the *inappropriateness of recommended technologies or the priorities and processes which generated them* (Chambers et al. (1991) as cited in Dart 2000 p44, Rhoades and Booth (1982) in Dart 2000, and, Scoones and Thompson (1994)). Scoones and Thompson (1994) extended the *Farmer First* approach by exploring and promoting the fundamental social and institutional changes required within the power relationships of the various groups that comprise an agricultural domain.

As previously discussed (Chapter 2.3.1), the origins of action research methods stem from the work of Lewin prior to and during WWII. More broadly it could be argued the entire Farmer First paradigm has its roots entwined with Lewin’s contributions, which were intended to help liberate minority groups, including Jews and Blacks in America. In the 1960s and 1970s these methods were adapted, transformed and applied to varying degrees to developing rural communities. In more recent years these methods have been further transformed to become a significant force in Australian and international agricultural extension methods and practices (Huizer 1997).
Divergence from traditional extension practice spawned the development of alternative philosophical and epistemological foundations for modern extension. Similar approaches continued to be delivered by Chambers (1997) who emphasised the mobilization of local knowledge, decentralization of power structures, project democracy (equality amongst participants), diversity of project content (over standardisation), and, dynamism (rather than stabilization) of project goals, amongst other items. Röling (1995) identified contemporary limitations of the Positivist paradigm underpinning traditional extension, and suggested a constructivist epistemology to support future extension development and practice. This shift was not touted as revolutionary, but rather as a different epistemology that includes the conventional one (positivism, or realist-positivism), but ultimately leads to different choices. Röling called this [new] paradigm ‘interactive agricultural science’ (Röling 1995, p17).

Amongst the properties of this interactive agricultural science are the following (Röling 1995, p18):

- **Epistemology:** Constructivism.
- **Concept of truth:** Multiple perspectives, diversity.
- **Nature of treatment:** Interactive and participatory.
- **Goals:** Multiple, often in conflict with each other.
- **System concept:** Soft: a construct and a path to collective action.
- **Policy:** Arises from interaction among stakeholders across levels.
- **Role of science:** Active partner in the social construction of reality.
- **Type of science:** Hybrid of natural and social science.
- **Role of extension:** Facilitating learning, stimulating participatory methods.

With these new parameters, Röling laid the challenge for agricultural science to put this new paradigm into practice, which has occurred to varying extents since the 1970s. Dart (2000) provides a reasonable synopsis of these developments, suggesting the growth and development of farmer-first extension emerged in Australia under the three main categories of:
• systems-based approaches,
• experiential learning, co-learning and action research, and
• group-based approaches to extension.

**Systems Thinking and Farming Systems Research**

Systems Thinking has a history dating back to the 1920s when what is now known as Critical Systems Thinking (CST) emerged (Midgley 2000). A later offshoot from this Systems movement was Farming Systems Research (FSR), which developed in the 1970s and took a broader view of the farming unit than traditional extension by incorporating the whole farm (or even community) and not just isolated components for the attention of research. Farming Systems Research promoted farmer contributions to the research agenda as well as on-farm investigation, rather than relying wholly on research stations or other places detached from the reality of local farming conditions. This approach recast the farm as a complex bio-physical and social system that encompassed the farmer’s decision-making process, points out limits to reductionist scientific methods, and credits farmers, to some extent, as agents of innovation and experimentation (Carberry 2001, Cornwall et al 1994, Dart 2000, Dunn 1997, McCown 2001, Rölling 1988).

These developments reflect the paradigmatic changes experienced in Systems Thinking that originated from the combination of quantitative applied science with human relations theory (discussed in Chapter 2.3.1) that sought to promote the role of people within workplaces (Midgley 2000). Further reference to FSR is made in Chapter 7, section 4.

**Experiential learning and the Hawkesbury School of Extension**

Dart (2000) states that *experiential learning*, as defined by Kolb (1984), was the basis for the development of the *Hawkesbury School of Extension*. This approach, while sharing much with the principles of Farming Systems Research, emphasised the role of people and the importance of the social systems they formed, while still acknowledging a fundamental linkage with the bio-physical characteristics of
a farming system. In addition to experiential learning, the Hawkesbury Agricultural College (as it was then known) promoted adult learning, systemic and contingency approaches to problem-solving, AL/AR approaches, scientific method and group theory (Pretty and Chambers 1993).

A leading figure within the Hawkesbury movement was Richard Bawden, who states (Bawden et al. 1985) that he and his colleagues considered the prevailing reductionist and discipline-based approaches of conventional agricultural and management sciences to be inadequate for meeting the needs of Australian agriculture. Instead they believed a new paradigm and mode of praxis was required that encompassed the interactiveness between the farmer, the natural environment, and the social environment. As a means to meeting this requirement, a Systems-based approach was developed for application within agriculture. This approach acknowledged a multitude of layers of complexity within farming systems, the importance of adult learning, and promoted group and individual learning and research processes for application, namely Action Research.

The Hawkesbury approach resonated with Kolb’s praise of Lewin’s contribution of Action Research because it provided a cornerstone of the experiential learning movement, along with other contributors such as Dewey and Jean Piaget.

Experiential learning conforms to the key tenets of AL/AR methodology by identifying the cyclic stages of learning as: concrete experience, reflective observation, abstract conceptualisation and active experimentation (Kolb 1984 as cited in Dart 2000). As far back as the 1960s and with specific reference to extension, Tully cited Professor Kolbe’s assertion that (Tully 1966, p152):

Practicing extension demands a special form of procedure or mental activity by way of learning, teaching, modeling or education. The system or procedure mostly concerns adults who have a free will of their own and must be convinced or persuaded to change their actions or behaviour, with the result that extension education also depends on exceptional skill as well as on the convincing power of communication. This system or procedure of extension is referred to as its methodology and also requires certain knowledge regarding education, sociology, anthropology, psychology and practical extension.
Further linkages between PPP and the Hawkesbury approach to extension are discussed in Chapter 7.4.

**Group-based extension**
Changing economic and political pressures began to influence publicly funded extension services from around the 1980s. Extension began to be assessed as to whether it was a public or private good, with the result being that public provision of extension services became less tenable in the face of ‘user-pays’ and economically rational principles. One way to overcome this cost-recovery pressure was to ‘wholesale’ public extension services by delivering agricultural knowledge to groups of farmers rather than to individuals (Russell 1989, Marsh and Pannell 1998).

In addition to economic pressures, group-based extension was in-part a product of a growing environmental political agenda within western societies. The consequences of this required tangible changes within agricultural production process and its information delivery systems. One exemplary outcome in Australia was the rise of the Landcare movement and its establishment of regional facilitators to work with local rural communities. These facilitators challenged the traditional linear approach theory to extension because they were not generally technically trained in agronomy. Landcare was aimed at engaging whole communities, as distinct from the once dominant one-to-one extension delivery. These group-based methods altered the traditional extension paradigm by asserting the legitimacy of local knowledge and bottom-up extension methods rather than top-down or linear approaches. The value of using group processes to achieve progressive change within agriculture was being demonstrated both as a more cost efficient mechanism and as a new and emerging conceptual extension paradigm for achieving environmental and production outcomes (Coutts 1997, Campbell and Junor 1992, as referenced in Dart 2000).

**2.4.3 Summary of extension approaches**
To illustrate the wide range of modern extension approaches, Maalouf (1988)
provided a summary of no less than eight categories of (developmental) extension. Some of these categories have already been discussed, such as the technology transfer model, participatory methods (Farmer First), and the systems approach. Apart from these, Maalouf defined the commodity-specialised approach, which provides technology transfer extension through commodity organisations and their field staff but measured success in terms of commodity production levels (not simply adoption rates).

The *training and visit* approach assumed a lack of training and support for government extension officers and so required their regular attendance to local farms and involvement in frequent farm-related activities, with success measured by production levels.

The *project* approach relies on a high level of rapidly imported resources to the farm or rural community that would not have been available through government bureaucracy, with short-term change being the measure of success.

The *cost sharing* approach required local people (including farmers) to pay a portion of the costs of extension services, with their willingness to do so marking the success or failure of a project/activity. The *educational institution* approach provides non-formal instructive education to groups of farmers and other local people, often in a format similar to courses and content offered at linked educational institutions, with success measured by attendance levels (Maalouf 1988).

2.5 **Combining methodologies for this research**

This review examined the methodological underpinnings of AL/AR and extension that are relevant to PPP. The guiding principles and philosophy within AL/AR and extension were combined throughout PPP to form a mixed methodological approach. Both the PPPLT and I (for purposes of this research) adopted and implemented the values and beliefs associated with a constructivist methodology, and upheld the core principles associated with AL/AR. These influences together
produced the following formulation of a methodological framework for this research and the management of PPP:

- openness to external ideas (pluralist),
- democratic process (equality amongst participants),
- social justice (agenda sharing, inclusive, fair),
- learning and research through action,
- action within real world context,
- participation highly valued, as individuals and collectives, and,
- situation improvement for stakeholders.

PPP was in part spawned from the PPPLT’s rejection of the traditions of Technology Transfer, in favour of a mixed farmer-first, participatory, experiential learning approach. Shumsky encapsulates the essence of what the PPPLT aimed to implement, which resonates strongly with the Farming Systems Research approach to extension:

_A cornerstone of the action research movement is its criticism of traditional research for trying to initiate change through dissemination of research results, rather than through the involvement of more people in the process of research_ (Shumsky 1990 cited in Kemmis and McTaggart 1988, p6).

In operating PPP the PPPLT relied upon a tri-disciplinary reference system using the methodologies of AL/AR, contemporary extension theory, and the broadly defined approach of Farming Systems Research. By governing and interpreting events in PPP using a broadly qualitative methodology and the philosophies of AL/AR and extension, insights and analyses were gained that otherwise would have been limited if guided by a single discipline. The methods pertaining to these methodologies are described in Chapter 4 within their real world context of the NSW dairy industry.

This thesis research (similar to the PPPLT) embraces a qualitative methodological approach (as described above) that enables a range of corresponding qualitative
methods to be applied. The specific methods selected to conduct this research are presented in Chapter 3 in light of the research context being investigated.
Chapter 3 — Method Selection

Faulty reflections ... are not the real danger. Rather it is that all single reflections are distortions. True reflections can only come from many images, a selection offered from among which one chooses, discards, makes corrections. Only in maturity, with multiple images, is greater accuracy possible. Only then can one identify not only the false reflections of others, but the distortions one provides oneself.

Myerhoff and Metzger (1980, p99)

3.1 Method selection for this thesis

Distinguishing PPP from PhD research

Throughout PPP I consistently maintained two roles: PhD student and PPPLT member. The methods applied through each role were similar but not identical. This chapter differentiates the methods used to generate this research from those implemented by the PPPLT. Midgley’s (2000, p171) definition of method is
accepted as a set of techniques operated in a sequence (or sometimes iteratively) to achieve a given purpose.

The PPPLT’s purpose for applying AL/AR as a form of extension was to achieve industry outcomes, while this research focuses on the effectiveness of AL/AR to deliver such outcomes to the PPPLT and the dairy industry. The methodological foundations of AL/AR, extension and Farming Systems Research (Chapter 2) are embraced by the PPPLT, and to conduct this research.

Methods employed for this thesis relied primarily upon the qualitative research technique of participant observation. This approach was used to elicit an analysis of social-action processes played out by dairy farmers and industry stakeholders in PPP. On the other hand, the PPPLT literally applied the method of AL/AR, with a view to achieving industry outcomes and outputs. In applying AL/AR, the PPPLT also employed various qualitative data gathering techniques.

**Beginning with a pluralistic methodological framework**

Based on Midgley’s outline of pluralist versus isolationist methodology and corresponding methods, this thesis pertains to a pluralistic methodology (as argued for in Chapter 2). I agree with Midgley’s notion of methodological pluralism where we can use a wide range of methods in support of particular purposes (Midgley 2000, p172).

An isolationist methodology, such as positivism, accepts the validity and/or legitimacy of just one method (or a narrow range of methods), while the pluralistic approach can borrow methods attributed to other methodologies but they are seen through the theoretical lens of his or her own methodology, and are made meaningful in local situations by the way they meet (or fail to meet) the purposes of the agent(s) engaged in intervention (Midgley 2000, p172). Figure 8 shows the relationship between isolationist and pluralistic methodology and corresponding methods, and is adapted to represent the methodology/method context of this research.
(Adapted from Midgley 2000)

In addition to the arguments for methodological pluralism cited in Chapter 2, further support for observation in service of intervention (as promoted by Lewin) can be found in Einstein’s thoughts related to the development of physics, where he states: our inability to know the world ‘as it really is’ means that non-empirical ‘speculation’ has to be an integral part of physics ... What is observed cannot be independent of the observer (Einstein 1934, cited in Midgley 2000, p123).

This linkage between the observed and the observer negates the founding notions of independent observation and objectivity that underpin Positivist methodology. Based on this reasoning, I embrace a constructivist methodology that leads to the literal construction of a research method tailored to suit:

- the qualitative nature of the research domain,
- the dairy industry context of the research, and
- the research requirements of data collection, analysis, and results.
3.2 Elements of ethnography

For this research, I have used the approach of immersing oneself (researcher) within the culture of the subject domain (the researched) by personally engaging with the people and context being observed. Ferguson (1995) points out that this approach follows the view of ethnomethodologists such as Robin Leidner, Barbara Czarniawska-Joerges, John Van Mannen and Clifford Geertz amongst others. In conjunction with this approach I have treated the experience of PPP as a case study that I have described and analysed from my perspective as a participant-observer.

As a student member of the PPPLT, I assisted the Phase 1 coordinator, while in Phase 2, I was the coordinator. Being personally located within the internal workings of all three of PPP’s tiers of research I was mindful of the ethnographic view that what we see, what we perceive is always dependent on where we are. If we ‘observe’ a study object from our ivory tower, we will interpret the behaviour of our study object through our own values and norms (Ferguson 1995, p9).

Not wanting to create my own ivory tower by being an observer without genuine contact with my subject area, I deliberately involved myself in the implementation of PPP. This involvement included: organising PPPLT meetings and farmer meetings; facilitating focus groups meetings with farmers and organising speakers; contributing to the management of Regional Dairy Group projects; co-hosting PPP conferences; compiling and presenting project reports; fostering and maintaining links with contemporary dairy projects; and contributing my thoughts and opinions to PPPLT meetings and management initiatives of an executive nature.

In keeping with Greenwood and Levin’s (1998, p7) view of appropriate methods for AL/AR practitioners I support the notion that Action Researchers accept no a priori limits on the kinds of social research techniques they use. Surveys, statistical analyses, interviews, focus groups, ethnographies, and life histories are
all acceptable ... Formal quantitative, qualitative, and mixed methods all are appropriate to differing situations.

Observation in service of intervention
By melding my PhD role with that of the PPPLT, to gain meaningful and valid insights for research purposes, I became exposed to the dynamics of the PPPLT itself, as well as the impact of its actions upon individual farmers, local communities of farmers, regional communities of farmers, and collectively, upon the NSW dairy industry.

As a PPPLT member I engaged in theory-generating research, firstly, because the project operated within its real world context, and secondly, by seeking emergent issues from a problem domain of which little was previously formally documented. This theory-generating approach was adopted rather than strictly applying established theory, as would have been the case had I embarked on a theory-directed approach.

Intervention within the primary tier of PPP research. At the primary research tier (Figure 4, Chapter 1.2) my role within PPP placed me in contact with virtually all the PPP farmers across the seven dairy regions in NSW. By assisting the implementation of PPP within Regional Dairy Groups, through organising and facilitating farmer focus groups, co-developing farmer projects, organising conferences, activity evaluation and report writing, I was able to track the emergence, understanding, acceptance and engagement of dairy farmers with PPP.

Intervention within the secondary tier of PPP research. At the secondary research level (Figure 4, Chapter 1.2) I witnessed first hand the developmental path of individuals and their collective Regional Dairy Groups. As a participant observer in contact with all PPP groups I was able to assess the characteristics of individual regional dairy groups, as well as consider relative comparisons between groups. While engaging with PPP at the secondary research tier, I gained
an intimate understanding of human behaviour, in order to explain differences in the rate of uptake of PPP activities within and between farmers and their groups.

**Intervention within the tertiary tier of PPP research.** At the tertiary level, I was able to observe a complete cycle of PPPLT functioning. This cyclical process began with (the PPPLT’s) formulation of AL/AR method, development of project strategy, and delivery of this strategy (largely in pursuit of farmer participation), followed by my observation of farmers’ reactions and behaviour to PPPLT actions, and finally identification of the PPPLT’s response to their impact and influence on farmers. This enabled me to better understand and make relative judgements about PPPLT functioning and project management, as well as assess the values, beliefs, conceptual thinking, ideas, and chosen management directions of the PPPLT as they evolved and were delivered to farmers.

An important point is that many elements of interest were dynamic over the life of PPP, but my membership of the PPPLT enabled the identification of repetition and patterns of behaviour and instances of change, such as changes in beliefs, project aims, interpretation of methodology and methods, industry structure, and strategies for action.

An appraisal of individual PPPLT members was possible from my perspective, but of greater value was the ability to observe the PPPLT as a whole: its formulation of AL/AR and extension theory into practice, based on shared understanding of members and friends of PPP.

Beyond the managerial aspects of PPP, the tertiary tier of this research is acutely concerned with the theoretical basis of PPP. The theoretical paradigms that the PPPLT embraced, adapted and applied to the NSW dairy industry are assessed and analysed within this research by relating the underpinning ideological concepts to (my) personal, observed experience of PPP. In this way meta-research issues, based on AL/AR and extension theory and practice, are identified for
discussion and analyses that are intended to result in a theoretical contribution to AL/AR, extension and industry development.

3.3 Qualitative research techniques

Applying AL/AR methods within PPP required the application of a range of qualitative research techniques. This section describes the sources of data, methods of data collection, and, tools of analysis used for this research and by the PPPLT, and demonstrates how the two related to each other.

3.3.1 Data sources for this research

Research data generated across the three tiers of PPP research (Figure 4, Chapter 1.2) are a product of intervention, by me as researcher and the PPPLT, to the NSW dairy industry. These data sources are identified and described (below) in relation to each tier of this research.

Primary research data sources

- Researcher liaison with farmers and their Regional Dairy Groups — this involved being a part of local, farmer-driven projects (usually of a technical nature), as well as observing the social processes that underpin them.

- Researcher liaison with NSW Agriculture, Charles Sturt University and the University of Western Sydney — in many Regional Dairy Groups staff from these PPP organisations assist farmers to meet their learning and research needs. As a result I engaged with and observed the farmers’ interaction with these staff.

Secondary research data sources

- Researcher liaison with DIDCO and Dairy Australia — both these organisations played a reviewing role in PPP, providing funding and broad project guidance to the PPPLT. Of interest to this research is the influence PPP has had on both, particularly in terms of promoting the role of farmers in determining their learning and research agenda.

- Researcher liaison with PPPLT — attending meetings and engaging with people from stakeholder institutions to manage NSW-wide project logistics. I observed the behaviour of participants, as well as my own influence in these meetings.
Tertiary research data sources

- Researcher liaison with UWS and CSU that was conducted from an academic perspective. Reflection upon primary and secondary data and events with respect to relevant theory. In a sense tertiary data is a form of meta-data because it consists of information about information from the primary and secondary sources. To this end, I have engaged with colleagues from both PPP universities in the interests of comparing applied methods with expectations and actual outcomes.

- Discussion, reading, learning and understanding of conceptual models, theory, methodology and related methods by personal research and PPPLT contact.

3.3.2 Data collection methods

The PPPLT communicated with farmers through a wide range of mediums, each of which contributed to the compilation of PPPLT reports to industry and hence primary data sources for this research. In total, seven data collection points (DCP) were identified, including my diarised journal of events.

DCP1: focus groups

The primary qualitative technique for meeting with farmers was the focus group. The PPPLT’s method of recording data from events that occurred in the field is documented in Jennings et al. (2000a, 2000b and 2001) and Jennings and Packham (2000 and 2001).

The following indicates the way in which a typical PPP focus group was conducted to initiate PPP in the dairy industry and gather data for research purposes.

Facilitated focus group meetings were used to define the purpose of each stage of PPP for each Regional Dairy Group, and to establish active community discussion groups where necessary. Participants in focus group meetings include dairy farmers and their families, relevant local consultants, extension officers, and representatives from government and research agencies. The qualitative data, mostly in the form of comments and conversations, generated by these focus groups were recorded by a scribe. Records of all white board notes that reflect discussions, debate and points of consensus as they occur, were kept (Jennings et al. 2000a, p2).
After the ASK stage of Phase 1 it was no longer appropriate to rely singularly on focus group dialogue to collect data. Farmers began to conduct their chosen research activities and created their own data, mostly of a quantitative nature, such as soil information or pasture productivity. In most cases PPP asked for copy of their documented results, or a demonstration of how results were achieved and what they meant to the farmers involved. The majority of data collected since the introductory ASK stage is a collage of farmer activity reports, and *ad hoc* or contingent communications with farmers, and focus group dialogue.

**DCP2: electronic mail and telephony**

E-mail data has been stored electronically, and kept as partial evidence of events occurring in the field. Some personal telephone calls have been documented in my journal, as have face-to-face conversations.

**DCP3: farmer teleconferences**

PPP facilitated farmer teleconferences with one or two representatives from each Regional Dairy Group. All such teleconferences were recorded and transcribed for analysis.

**DCP4: farmer conferences**

Three NSW-wide conferences were held with PPP dairy farmers, each with a proceedings document of farmer presentations (such as Dairy Australia 2003a). In 1999 and 2001 farmer presentations were transcribed and edited for typographic and grammatical errors but otherwise were left as is for publication, while in 2003 farmers provided their own one page summary of PPP activities ready for publication.

**DCP5: PPPLT functioning**

This team of usually 6-8 people came together under standard meeting procedure, with the co-ordinator usually taking a default role as the Chair, while another PPPLT member volunteered to scribe notes as required. On a few occasions a formal facilitator was appointed to run PPPLT meetings. PPPLT meetings were
conducted in a spirit of openness and equality amongst participants, in keeping with the democratic nature of the AL/AR method being employed. On occasions the PPPLT used telephone conferencing to discuss urgent matters or to overcome geographic hurdles and minimise travel costs. Most PPPLT telephone conferences were recorded and stored on audiocassette tapes.

**DCP6: PPP external review**

At the close of Phase 1 an external evaluation of PPP was conducted by a contracted consultant (Roberts 2001). This evaluation relied on telephone surveys and to a lesser extent individual and group interviews.

**DCP7: diarised journal**

Whilst the documentation of farmer activities was evidence of PPP outputs, it was the outcomes of these activities that I was observing and recording in a diarised journal. This personal journal, kept over the life of PPP, was used to inform PPPLT reports as well as this research. My journal provides a record of my personal observations, reflections and interpretation of PPPLT meetings and associated activities, PPP farmer meetings, and similar relevant events.

With the majority of PPP events I documented my personal interpretation of the nature and progress of PPP. Some meetings or events were omitted from my journal if I did not attend, such as project proposal meetings prior to February 1999, or if they were minor, such as administrative processing of PPP funding cheques to Regional Dairy Groups. In meetings which I did not attend I was made aware of their essential content by the PPPLT.

Using this journal as a participating-observer I examined the PPPLT’s bank of data collection across the primary, secondary and tertiary tiers of research. At times, this journal served to inform the PPPLT’s formal reporting requirements, but for this research it has provided a consistent data source for assessing the impact of PPP on human behaviour.
Other data sources
Various other sources of data were generated during PPP and have been accessed for this research, including refereed publications, formal and informal presentations to academic and industry institutions, and other industry project reports and personal communications.

3.3.3 Method of analysis of qualitative data
Formal data analysis was conducted using qualitative analysis software on a computer. The computer program Nudist (Gahan and Hannibal 1998) was used to thematically code transcribed data and then to analyse selected data within these coded themes. Several data validation mechanisms were employed to assess the significance and value of field data. These mechanisms include PPPLT discussion of farmer meetings, reflections on dialogue, discussion of personal values and their impact on data interpretation, as well as feeding back the PPPLT’s interpretation of farmer’s words for validation or correction. Evidence of this is provided by Jennings et al. (2000a, p2):

All recorded data, combined with the thoughts and recollections of the PPP facilitators and scribe were interpreted and standardised to form a consistent qualitative data set that enabled comparison of results within and between the Regional Dairy Groups. In the process of interpreting raw data, the PPP researchers acknowledged their own identified biases and personal values. Qualitative data analysis software was used to manage the data electronically across groups and issues.

3.4 Foucauldian method
The work of Michel Foucault provides a useful method of historical inquiry. Several of Foucalt’s tools are applied to investigate the origins of extension (Chapter 6). In particular, an understanding of problematisation, archaeology, genealogy and discourse are gleaned (below) with a view to providing a useable method based on Foucault’s way of giving order to history and exploring the nature, presence and consequences of knowledge and power (Kendall and Wickham 1999).
3.4.1 Problematisation

Put in the simplest terms possible, but without debasing its meaning, problematisation is Foucault’s approach to history whereby a particular problem or issue is selected for investigation instead of an historical period. For example, Foucault’s own work cited problems such as: How did the prison emerge as the major form of punishment? or How did sex come to be seen as so important in terms of who we are? (Kendall and Wickham 1999, p22).

Foucault guided his historical research of prisons using a radical but unaggressive scepticism which makes it a principle not to regard the point where we are now standing as the outcome of a teleological progression ... which prevents one from assuming that what we have is better than — or more than — in the past. This approach does not deny the historian to reconstruct generative processes, but that it must be done without imposing ... positivity or ... valorisation. By this Foucault is not stating that the progress of humanity does not exist, but rather his historical methodological ontology rejects inquiry guided by the question How is it that we have progressed?, and instead recognises the problem is: How do things happen? (Gordon, 1980, p49)

In the context of the research presented in Chapter 6, this type of problematised research question involves asking why there is an apparent absence of farmers within contemporary industry processes of research, development and extension? Alternatively, this question could be phrased more generally as: How did the current forms of extension emerge?

3.4.2 Total versus general history

As a means for conducting an historical inquiry, Foucault is opposed to total history, and instead emphasises general history. Foucault explains that total history looks for overarching principles which govern the development of an epoch; by contrast, the general history eschews the ‘totalising’ theme, concentrating instead on describing differences, transformations, continuities, mutations and so forth (Kendall and Wickham 1999, p24).
Furthermore, Dean (1994) considers Foucault’s general history approach as
*indispensable*, stating that a general history ...

*seeks series, divisions, differences of temporality and level, form of continuity and mutation, particular types of transitions and events, possible relations and so on. A general history would be non-reductive, non-totalising, one which specifies its own terrain, the series it constitutes, and the relations between them: ... [It] opens up an attention to detail, grain, and complexity, and the specification of form of relation which is indispensable if we are to move beyond caricatures of historical periodisation passing for a science of social development* (cited in Kendall and Wickham 1999, p24).

With these thoughts in mind, the historical investigation of extension (Chapter 6) is aligned with a general history approach, rather than a total history.

### 3.4.3 Archaeology

*Archaeology* is a term defined in *The Archaeology of Knowledge* (Foucault 1972 cited in Kendall and Wickham 1999), as *the analysis of the statement as it occurs in the archive*. In Foucault’s words archaeology *describes discourses as practices specified in the element of the archive*, in which the archive is *the general system of the formation and transformation of statements* (cited in Kendall and Wickham 1999, p24).

Kendall and Wickham’s (1999, p26) interpretation of the principles of archaeology is two-fold. By employing a general, rather than a total history, archaeological research aims to be:

- **non-interpretive, by seeking to provide no more than a description of regularities, differences, transformation etc, and,**
- **non-anthropological, by eschewing the search for authors and concentrating instead on statements and visibilities.**

With regard to this second point, Foucault has suggested a departure from a tradition or inclination to search for meaning in human beings. Although it is difficult to avoid this *inclination*, particularly within an historical account of agricultural extension that is peppered with individual personalities, I am
conscious of Foucault’s approach.

In order to apply the principles of archaeology established by Foucault, Kendall and Wickham (1999, p26-27) offer several points describing the aims of archaeological research, of which the following are considered pertinent to the current study. Archaeological research in action attempts:

- to analyse the relation between one statement and other statements;
- to analyse the positions which are established between subjects in regard to statements – where subjects are human beings;
- to describe ‘surfaces of emergence’ – places within which objects are designated and acted upon;
- to describe ‘institutions’, which acquire authority and provide limits within which discursive objects may act or exist.

To provide a feel for how the above guidelines might be applied to a real world context Kendall and Wickham (1999, p27) provide a demonstrative example, in this case with regard to the third point above:

_The attempt to describe ‘surfaces of emergence’ focuses on ‘the school’ or ‘the family’ as a domain. Within this domain, educational psychology, for example, can determine the ‘proper’ development of children as special types of educational subject (pupils, slow learners, geniuses, etc), and can act on children as raw materials (children as family members, playful individuals, etc)._  

The above points are a methodological guide for implementing Foucault’s principles of archaeology and are applied in this research with regard to the emergence of agricultural extension and education within tertiary institutions (Chapter 7).

### 3.4.4 Genealogy

Foucault considered _genealogy_ as being complimentary to archaeology, although the two have distinct differences. One major difference identified by Kendall & Wickham (1999, p31) is that _archaeology can be understood as Foucault’s method [while] genealogy is not so much a method as a way of putting_
archaeology to work, a way of linking it to our present concerns. We might think of genealogy as the strategic development of archaeological research.

Linking the content produced by archaeological research to present concerns is emphasised by the investigation of extension’s origin in Chapter 7, in which maintaining the relevance to issues in PPP and contemporary extension exists as an ever-present challenge. To meet this challenge the following principles of genealogy, as interpreted by Kendall and Wickham (1999, p34), were adopted as appropriate. Genealogy:

- describes statements but with an emphasis on power;
- introduces power through a 'history of the present' concerned with 'disreputable origins and unpalatable functions', making the older guests at the table of intellectual analysis feel decidedly uncomfortable by pointing out things about their origins and functions that they would rather remain hidden;
- describes statements as an ongoing process, rather than as a snapshot of the web of discourse;
- concentrates on the strategic use of archaeology to answer problems about the present.

In regard to the use of genealogy it is important to recognise that Foucault intended it to be an entirely non-judgemental instrument. [Genealogy] does not judge as it rudely flushes out assumptions; claims about what is right and what is wrong have no place here; Foucault wants to make facile gestures difficult (Kendall and Wickham 1999, p30).

This aspect of genealogy makes clear that historical investigation should be free from pre-determined theories of conspiracy, prejudice or bias. This research aims to examine the historical development of status and inter-relationship of farmers with their surrounding institutional landscape. In doing so, I am not attempting to seek results that, for example, support a conspiracy theory regarding contemporary institutional arrangements and the low level of direct farmer input into industry processes of research and development.
3.4.5 Discourse

Foucault’s definition and discussion of discourse is extensive, with great volumes of literature by other philosophers having been added. For purposes of this research, the definition and meaning of discourse is confined to the elements that elicited a practical application of the concept of discourse.

One way of thinking about Foucauldian discourse is to understand that discourses are productive. For example medical discourses regarding some people’s lack of ability to reason produce mentally disabled people as a social category. Discourses about penology produce the criminal (Kendall and Wickham 1999), and similarly agricultural economics and extension discourses produce the spectrum of laggard to innovative farmers.

Noting that for Foucault, statements are referred to as things, as well as words, Kendall and Wickham (1999, p42) offer the following chronological steps for reading and analysing discourses:

1. Recognise discourse as a corpus of ‘statements’ whose organisation is regular and systematic.
2. Identify rules of the production of statements.
3. Identify rules that delimit the sayable.
4. Identify rules that create the spaces in which new statements can be made.
5. Identify rules that ensure that a practice is material and discursive at all times.

Step 1 is critical to enabling the employment of steps 2-5, since failure to recognise the discursive framework as a corpus of statements that hold regular and systematic properties denies the options (steps 2-5) of identifying what type of rules govern the organisation of discourses.

To engender the term discourse with practical meaning for historical inquiry about extension, the discourse of agriculture is itself comprised of an array of other discourses, including scientific discourse, economic discourse, rural
sociological discourse, biological discourse, pedagogical discourse, extension
discourse, mechanical engineering discourse, the discourses of institutions and
policy making (government) processes, discourses of the self, environmental
discourse, systems thinking discourses etc.

3.4.6 Power-Knowledge nexus

For Foucault, power can be thought of as something that is practiced. Kendall and
Wickham (1999, p55) provide the following interpretation of Foucault’s notion of
power: While power is a relation of forces and knowledge is a relation of forms,
the two relate to each other as different but complementary. Power is non-
stratified, local, unstable and flexible; knowledge is stratified, stable and
segmented.

In recognising these differences it is gleaned that knowledge supports power in
action (in governance) (Kendall and Wickham 1999, p55). These points of
definition provide a framework for accessing the origin of extension through an
exploration of the dynamic balance of power and knowledge, between farmers
and other agricultural stakeholders, within industry research and development.
That is, an understanding of Foucauldian power and knowledge are employed in
Chapter 6.1 to illuminate relations amongst agents of agricultural extension,
including farmers, agronomists, consultants, academics, institutions, officers of
institutions, scientists etc.

3.4.7 Power and subjects

Foucault describes power as being productive — of which one significant product
is the subject. Importantly, subjects are not considered helpless or passive entities,
but rather are active and even contribute to their own status as subjects (Kendall
and Wickham 1999). For example, farmers can voluntarily subject themselves to
new technology, and the institutional processes that generate it, by adopting
commercialised innovations.
3.5 Summary of method selection

This chapter has endeavoured to introduce the methods used to conduct this research, and differentiate them from the methods deployed by the PPPLT. The selection of methods for this research is an eclectic combination of grounded theory, ethnography and AL/AR, qualitative research techniques, and an embrace of some Foucauldian thought on historical inquiry and power relations.

PPP data is analysed for this research from several perspectives, such as from that of the PPPPLT, the Phase 2 coordinator, a PhD student, other PPP stakeholders such as research scientists, and farmers themselves. Where data sources have not undergone the scrutiny of validation by the original source (eg farmers), I (and the PPPLT) concur with Dey’s (1996, p235) view that:

While we can learn from the subjects of our research, and modify our analysis accordingly, we cannot allow them to become its final arbiters. Even if our account makes no sense to the subjects of our research, even if they reject the value of our explanations, we are entitled to persevere with our analysis. The validity of our account does not depend on acceptance by those who are subjects of it. Indeed, a critical account which reinterprets social processes and events may deliberately set against the current preconceptions of those who are subject to the research.

The last sentiment in Dey’s expression concurs with the PPP approach to altering (by increasing) the role of dairy farmers within industry processes of research, development and extension. That is, the PPPLT aimed to enact a degree of social change within its field of research, and so assessed its data with a view to identifying and tracing changes in the roles farmers played within the NSW industry.

Figure 9 illustrates the structural linkages that supported the function and operation of the PPPLT, this research, and together their contribution to the entire mix of PPP processes, content, outputs and outcomes.
Figure 9: Research roles.
3.6 Ethical conduct and researcher frame of reference

The ethical considerations relevant to my roles within this research satisfied the necessary requirements of the UWS Human Research Ethics Committee (UWS 2003). Such considerations demanded respect for collective and individual participant’s welfare, rights, beliefs, perceptions, customs and cultural heritage. The ethical value of justice require[d] that, within a population, there [was] a fair distribution of the benefits and burdens of participation in research and, for any research participant, a balance of burdens and benefits (UWS 2003). These conditions of conduct comply with relevant literature, including Miles and Huberman (1994), regarding privacy, confidentiality, anonymity, intervention, advocacy, honesty, trust, harm, risk, use of results, benefits, costs, and informed consent of participants within PPP.

Throughout my time with PPP it was made explicitly clear to all participants and organisations that I was the PhD student attached to PPP and the coordinator during Phase 2. This situation was stated in public, not only by me at appropriate times, but by members of the PPPLT including the Phase 1 coordinator. As a result I believe the integrity of PPP research data has not been compromised, biased or limited.

3.6.1 Theory of ethical conduct and this research

From a range of ethical theories available, such as teleological, utilitarian, deontological, critical theory, covenantal, relational, and ecological as are presented by Miles and Huberman (1994), the nature of this research, its context, and my personal approach align with House’s (1990, cited in Miles and Huberman 1994, p290) depiction of relational theory in terms of three guiding principles:

- Mutual respect: understanding others’ aims and interests, not damaging self esteem, not condescending.
- Noncoercion and nonmanipulation: not using force or threats or leading others to cooperate when it is against their interests.
- Support for democratic values and institutions: commitment to equality and liberty.
While these principles comply with several aspects of AL/AR methodology adopted by the PPPLT and myself in this research process, I also feel that elements of critical theory are present, particularly because of my dual roles in PPP and a clear purpose of promoting farmer activities. In this sense the theory guiding my engagement with NSW dairy farmers, matches the essence of critical theory which judges actions according to whether one provides direct benefits to the researched and/or becomes an advocate for them (Miles and Huberman 1994, p289).

3.6.2 Researcher frame of reference and the paradigm pendulum

Prior to PPP my professional training was predominately quantitative (economics and econometrics). The bulk of my professional training and work experiences prior to PPP were in quantitative methods, which is a personal and professional slant worthy of declaration, particularly in light of the qualitative nature of this research context (Chapter 2.1).

When first approached by PPP to consider the contents of this research my thoughts focused primarily on applying quantitative methods to the regional dairying communities. This ambition underwent rapid reconstruction during my first twelve months of joining PPP. Being governed by the necessarily qualitative nature of PPP I fostered an appreciation of mixed methodological approaches, whilst necessarily applying methods through a predominantly qualitative framework.

Researcher relations with farmers

Personally I have always felt at ease with farmers and country people. This is despite not having come from a rural upbringing that would normally develop one’s appreciation of rural culture and social traits. My positive appreciation of the farming community stems from experiences throughout my childhood and
subsequent years with farming family members in rural NSW, although I have lived mostly in high density, urbanised suburbs (Inner West) of Sydney, Australia.

Having joined PPP I soon realised how valuable my appreciation of rural culture would be. My childhood links to the country allowed me to confidently go beyond a purely observational role within PPP by engaging in relationships with dairy farmers, and in general, locating myself physically, socially and professionally where multi-faceted and deeper insights to PPP experiences are obtained.

**Concluding comment**

This chapter has detailed the methods used to conduct this research and that were applied to my experience and understanding of PPP as it occurred in the field to produce the issues of research and analysis that are presented in Chapters 5-7. The following Chapter 4 is an overview of PPP as it existed within the NSW dairy industry in both theory and practice, with selected events and case studies outlined for discussion in the remaining chapters.
Chapter 4 — Profitable Pastures Project in Theory and Practice

[What I value most about PPP is that] farmers are able to learn at their own pace.

PPP Dairy Farmer
(Dairy Australia 2003, p49)

4.1 Birth of the Profitable Pastures Project
The concept of PPP emerged from a series of events prior to the formal project application to Dairy Australia. These events (Box 3) provide a valuable pre-history of PPP that links the project to specific types of AL/AR, namely Participatory AL/AR and Emancipatory AL/AR. After two years of conceptually designing the proposed project, funding was approved in February 1999.
Box 3: Background to the Profitable Pastures Project.

The Dairy Industry Development Company NSW Ltd (DIDCO) called for expressions of interest from the Regional Dairy Groups for projects of regional interest earlier in 1997. A number of proposals were submitted, many of which had similar objectives. DIDCO decided that six of the projects fell into the category of feedbase management, and convened a meeting of representatives from these six groups to develop an umbrella project. It was deemed that such an umbrella project would yield a greater benefit for each dollar input. The meeting was attended by farmers representing the various Regional Dairy Groups, and researchers from NSW Agriculture and the Universities of Sydney, Western Sydney and Charles Sturt.

While discussion highlighted some differences in the individual proposals, it was agreed that there was sufficient commonality to develop a project which addressed issues relating to feed management practices in the dairy industry of NSW. It was decided to develop a project covering the six Regional Dairy Groups.

There is a vast amount of knowledge and management technologies available in the area of feed management to improve the profitability of dairy farms. However, surveys such as Project 20/21 Feedbase Survey (NSW Agriculture 1993), have observed that average milk yields from pasture are considerably less than achievable levels demonstrated by research and monitor farms. Such surveys have emphasised the need to increase the pasture management skills of farmers.

A report on the research and extension needs of the NSW dairy industry conducted by PDP Australia (1995) identified the ‘Development and utilisation of the pasture feedbase as a key area. Improving the access to existing knowledge of pasture and grazing management was seen as critical to addressing this need (PDP Australia 1995). The PDP review recommended that active participation of industry groups in monitoring and comparative whole farm analysis was the strategy to achieve the outcome of improving access to existing knowledge.

Given these needs in the NSW dairy industry, future meetings of the research team sought to discuss how a project could be designed to address these needs. It was recognised that the issues influencing feedbase management and the level of knowledge and technology usage would differ between and within the six Regional Dairy Groups. The project therefore needs to be flexible and adaptable to the needs of farmers in each of the regions.

(Dairy Australia 1996)

In summary, the newly formed DIDCO called for expressions of interest from its Regional Dairy Groups to identify local on-farm dairy issues across NSW that constrained farm management, productivity and profitability. In response, one issue was dominant: local pasture productivity could be improved to lift dairy business profitability.

Box 4 describes the genuinely farmer-inclusive process that spawned PPP. Based on this farmer inclusion at the earliest developmental stage of PPP, the project can
justifiably be identified as Participatory AL/AR. Farmers responded to DIDCO’s request for expressions of interest, and DIDCO is a farmer-run organisation — as designed and instituted by Dairy Australia. There was no prescriptivity in the call for expressions of interest, and hence farmers’ genuine priorities (at that time) were conveyed to DIDCO without being corrupted by political or other distorting influences. Contributing farmers were not manipulated or pushed into an ulterior or pre-determined agenda by the expectations of industry, government or the private sector.

**Box 4: Industry consultation by the Profitable Pastures Project.**

The [PPP] proposal has been generated from the individual Regional Dairy Group project proposals, and has involved the Regional Dairy Group’s throughout its development. Their support for the project is indicated [within this proposal] by their time commitment and agreement to pursue this project as a priority. The chairpersons of the regional dairy groups involved in the project are listed under project staff.

(Dairy Australia 1996)

DIDCO then facilitated a state-wide synergy amongst farmers and relevant agencies to form one over-arching project structure. This approach was carried by all contributors, in preference to administering PPP as an individual project in each Regional Dairy Group.

**4.1.1 Formation of the PPPLT**

The University of Western Sydney and Charles Sturt University became key players in producing DIDCO’s application for PPP to Dairy Australia, with the universities providing theoretical models of farmer-participatory approaches and Farming Systems Research. The farmers’ (previously stated) need to improve pasture was married to the Farming Systems approach to produce a farmer-oriented and participatory project.

NSW Agriculture contributed logistic support from its local officers including agronomists, livestock officers for PPP delivery, while senior departmental managers supported project design and the original application for funding. By joining the two universities with NSW Agriculture, DIDCO and Dairy Australia,
a dynamic forum for a multi-institutional partnership was created, with representatives from each forming the PPP Leadership Team (PPPLT).

Although the membership of the PPPLT did transform over the life of PPP, it generally consisted of:

- 2 DIDCO representatives (dairy farmers),
- 2 UWS representatives (academics),
- 2 NSW Ag representatives (senior manager and PPP Coordinator),
- 1 CSU representative (academic),
- 1 PhD student with UWS, and,
- 1 liaison contact with Dairy Australia.

The PPPLT managed the project, although only the PhD Student (UWS) was full-time, with one-third of the Phase 1 Coordinator’s time being allocated to PPP work. The remaining people were part-time contributors¹ with most members’ main input being to attend PPPLT meetings and teleconferences with little, if any, time spent in the field contacting and facilitating dairy farmer activities. Some administrative duties, such as accounting and report/milestone writing were shared across several PPPLT members. The majority of the PPPLT were mostly reliant upon the coordinator and student to relay events in the field. The PPPLT met face-to-face approximately every six months, although teleconferences became more frequent over time and occasionally replaced meetings.

### 4.1.2 Institutional stakeholder perspectives

From the university perspective PPP would not only service farmers’ needs for pasture improvement, but also provide greater opportunity for farmers to engage directly in research, aided by the two universities. The promotion of farmer linkages to the research community would improve the relevance of university research results and increase farmers’ confidence in adopting technology. Both

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¹ Prior to PPP funding key people contributed a much larger proportion of their resources to establishing PPP.
universities (UWS and CSU) had a strong interest in PPP because it applied theoretical concepts of agricultural systems that were promoted by the University of Western Sydney and Charles Sturt academics, including the principles of adult learning, AL/AR and contemporary extension that went beyond the traditional Technology Transfer approach.

From the government perspective, PPP met NSW Agriculture’s charter to support the dairy industry, while strengthening the department’s professional partnership with industry (especially DIDCO) and the universities. NSW Agriculture provided managerial expertise for the PPPLT, as well as field officer’s time and resources to the local operation of PPP. The NSW-wide coverage of PPP satisfied the government and industry requirement of project efficiency by encompassing the whole DIDCO area of dairy regions (one RDG did not join PPP until Phase 2).

4.1.3 Novel intent: fostering a farmer driven agenda
PPP aimed to increase the role that farmers played within industry processes of learning and research, not only by delivering farmers control of PPP funds, but by facilitating a predominately farmer-driven research agenda that, potentially, would displace the status quo of conventional research being directed by non-farmers, such as government agencies and officers, private sector, and non-farmer dairy industry representatives (such as processors).

PPP financially supported a domain of learning and research that was dedicated exclusively to farmers’ agenda, and intended to develop and promote their role in industry research processes. This idea was unique to the NSW (and Australian) dairy industry because of the degree to which PPP was committed to genuinely including the client — farmers — in the economic and social decision-making processes of PPP.

Identifying credible data as evidence of low farmer presence in industry extension is difficult, although Brien (1978, p.i) provides some insight as to the state of play in NSW in the late 1970s. His introduction to The Role of Farmer Organisations
in Agricultural Extension states: there was, in general such a low level of activity on the part of [farmer organisations] in extension that any attempt to undertake a detailed and wide ranging survey would prove fruitless.

The PPPLT envisaged a form of farmer participation that was unique qualitatively, in terms of the extent farmers determined project agenda, and quantitatively, by engaging a dominant proportion of farmers within PPP activities. This high level of farmer involvement distinguished PPP from most contemporary and previous dairy industry projects, including other participatory projects, because of the extent to which farmers were to be encouraged to take on the challenge of personally driving industry productivity and profitability through the pursuit of pasture improvement.

The first brochure distributed to Regional Dairy Groups from the PPPLT, emphasised the novelty of the project to farmers in the following manner (Box 5).

Box 5: PPP brochure.

<table>
<thead>
<tr>
<th>SO WHAT’S DIFFERENT ABOUT THIS PROJECT?</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Farmers are involved in all phases of the project.</td>
</tr>
<tr>
<td>• Problems and best practice are identified locally by locals.</td>
</tr>
<tr>
<td>• Research is carried out locally.</td>
</tr>
<tr>
<td>• Extension is done locally.</td>
</tr>
<tr>
<td>• Each group will develop their own partnerships with service providers.</td>
</tr>
<tr>
<td>• Problems and solutions identified locally are shared between regions.</td>
</tr>
<tr>
<td>• Action, research and learning are integrated into the one process.</td>
</tr>
</tbody>
</table>

(Dairy Australia 1999)

By selecting an AL/AR methodology and corresponding methods, PPP signalled a change away from traditional Technology Transfer methods that were reliant on
reduction and controlled research environments to generate *objective* results that, if worthy in the eye of *experts*, would be extended to farmers whether they liked it or not. Alternatively, the PPPLT supported the philosophy of AL/AR, and hence a re-assessment of conventional research processes, resulting in a belief that research and learning endeavours should take their place within their real world context.

Jennings et al. (2000a) describe the PPP hypothesis that research which takes place within its intended context is likely to bring more relevant solutions than conventional research that is followed by technology transfer extension. In this respect the PPPLT concur with Greenwood and Levin (1998), and so, within the AL/AR framework of PPP, *farmers establish themselves as core researchers of their own issues and farming challenges to generate outcomes which we hypothesise will be more meaningful and effective than results derived from conventional research models* (Jennings et al. 2000a, p1).

This expectation that research would start and end on-farm, with dairy farmers driving research activity, was flagged in the PPP proposal. Originally it was flagged that *research farms* (also known as Focus Farms) be established in each Regional Dairy Group to provide a platform for on-farm learning and research that could be readily accessed by local farmers and supported by relevant professionals as required.

### 4.1.4 Two Firsts: PPP contracts and financial Structure

PPP was contractually instituted across four organisations (Dairy Australia, the University of Western Sydney, Charles Sturt University and NSW Agriculture), and was the first time Dairy Australia issued a project contract with more than one organisation. This was significant in that it heralded a participatory ethos at the institutional level that was substantiated by Dairy Australia’s investment in PPP.

A guiding principle of PPP was that a minimum of fifty per cent of project funds would be distributed to the farmer groups. Each participating Regional Dairy
Group received $25,000 in Phase 1 and $10,000 in Phase 2. The farmer groups could also apply to the PPPLT for additional funds for casual assistance.

At the beginning of Phase 1 the only condition attached with the dollar allocation to Regional Dairy Groups was a broad requirement (by the PPPLT) that funds be spent on feedbase-related activities that increased on-farm pasture profitability. Within this requirement farmers had the flexibility to conduct a wide range of pasture-related activities. Flexibility was emphasised to ensure farmers realised the PPP research agenda was theirs to create. If farmers devised a project budget larger than the available PPP funds, it was accepted that farmers could seek additional external funding, with PPPLT assistance as required. Hence PPP funds could be considered (by the Regional Dairy Groups) as ‘seed money’ for significantly larger projects.

As noted by Dunn et al (2003), the PPPLT’s criterion for Regional Dairy Group expenditure (of PPP funds) was considered critical to delivering the ownership of learning and research processes to farmers, although it was not the only avenue for achieving this outcome. The PPPLT considered that transferring half of PPP funding directly to farmers with few strings attached, was a symbolic and tangible demonstration to industry that NSW dairy farmers had a greater role to play in learning and research processes within the dairy industry.

4.1.5 Piloting participatory processes for Dairy Australia
At the time PPP came into being the participatory approach was evident in the NSW dairy industry, although it was not commonly applied in projects funded by Dairy Australia. Previous dairy industry examples include projects such as Interest-Specific Learning Groups in Victoria, and Improving Educational and Advisory Services to the Dairy Industry in NSW and Victoria (Kelleher et al. 1990, Kelleher et al. 1991, and Woog et al.1990). Non-dairy industry examples also exist, such as the grains industry-sponsored project Improving Research Adoption by Wheat Producers (Woog et al.1993 and Kelleher et al. 1992). Relative to such projects the PPP approach was new because it investigated
unchartered territory in terms of the extent of farmer participation in learning and research processes.

The novelty of PPP is supported by comments from Dairy Australia officers. These comments are paraphrased as: *Dairy Australia considers PPP as a pilot project for participatory research processes, and the success or otherwise of PPP will determine the extent to which credence is given to future dairy industry funded projects that are similar in nature, ideology and structure (Diarised Journal).*

**4.1.6 PPP methodology**

By facilitating farmers to take control of the PPP agenda, the PPPLT hoped to engender a sense of responsibility amongst farmers for their research outputs and outcomes. This approach is encapsulated in the methodology cited in the original project proposal (Box 6).

**Box 6: Methodology of the Profitable Pastures Project.**

*The methodology for this five-year project is centred around the notion of farmer participation in identifying local limitations to pasture-based milk production, and deciding what existing technology and knowledge will be appropriate to implement to improve profitability, and what further research needs to be conducted. The project concept has been identified by farmers in the Regional Dairy Groups, and it is critical that farmers are involved throughout the project. Identified farmers, representing as many as possible of the types of operations in their sub-region, will collaborate with researchers from Universities and NSW Agriculture, as well as Agronomists and Livestock Officers from NSW Agriculture. The role of the researchers and extension officers will be to facilitate the various stages of the research, assisting farmers in identifying limitations and potential for improvement.*

(Dairy Australia 1996)

**4.1.7 PPP method**

The PPPLT chose AL/AR as the project method. This decision meant each Regional Dairy Group was expected to conduct PPP activities (of their choice) using AL/AR. The PPPLT pledged to build AL/AR into its own practice as an exemplary gesture.
Box 7: Method and stages of the Profitable Pastures Project.

The first planning meeting of the research team identified four sequential stages in the [PPP] research process, namely:

1. **ASK, DON’T TOUCH**
2. **WATCH & MEASURE**
3. **INVESTIGATE and**
4. **ACT (or IMPLEMENT)**

The first two [stages] of the inquiry seek to understand the practices, productivity and limitations to individual systems; the investigate phase involves experimentation with alternatives on farms; while the last phase involves the sharing of the findings with other farmers through extension approaches that emphasise farmers’ learning and adoption as the key outcomes. In a methodological sense, this approach falls within the popular category of ‘Action Research’. (Dairy Australia 1996)

PPP model as described in ‘farmer-friendly’ language from industry information brochure:

**Stage One: ASK (DON’T TOUCH)**
This [stage] will only be carried out once in the life of the project. In the first year, groups will find out what is happening with pastures in their region and will look at what management practices work and what don’t. A PhD student will help the groups gather information for this part of the project.

**Stage Two: WATCH & MEASURE**
For this [stage], groups will work in partnership with universities and NSW Agriculture to document and assess current practices. This is the time to look at what information is already available and what work has been done in the past so that the project can build on other activities such as Project 20 and 21. Farms that represent the local situation will be monitored to find out which practices are better than others and to find out what is preventing better practice.

**Stage Three: INVESTIGATE**
Farmers and project partners will collectively discuss new ideas, solutions to problems or different practices on local farms. Where new information is needed farmers will suggest research priorities. Research and different practices will be tried out on selected local farms and then evaluated. [The Project Coordinator] will work with groups to make sure there is a flow of information and ideas between the groups and that the group projects are complementary.

**Stage Four: ACT**
Farmers will assess which practices worked for their region and which didn’t. They will also decide how project findings will be extended, both in the local area and between groups. New or altered practices that come out of the research findings will continue to be trialed on local farms. Farmers will evaluate their results and may return to [Stage] 2 or [Stage] 3 to address the next problem. Some groups may do one large project and only do one cycle of the project whereas groups that initiate a number of small projects may cycle through the stages a number of times.

(Dairy Australia 1999)
In Phase 1 the AL/AR cycle (plan-act-observe-reflect) was the core element of PPP method, with an expectation of this cycle being enacted by farmers within their real world context, thus creating on-farm action learning and research. The steps of the AL/AR cycle were presented to industry in farmer-friendly language (Box 7).

4.1.7 PPP extension

The original PPP proposal emphasised the role farmers could play in delivering extension processes, especially to those farmers outside PPP activities. This was flagged as a commitment to symposiums, conferences or field days that would allow farmers to access PPP activities and results (Box 8).

**Box 8: Transferring results in the Profitable Pastures Project.**

_As farmers will be involved in the research process, the results of the work will be applied directly on the selected farms in each region. Each 'action research' farm will have a group of farmers meeting regularly with the researchers to discuss pasture performance and the potential management options available for implementation. As farmers involved in these groups will be actively learning, it is anticipated that the transfer of improved pasture management techniques will be high. Involvement of local extension officers and other Regional Dairy Group members is aimed at maintaining the local discussion groups, hence improving the transfer of results._

_Funds are available in the final year of the project for established regional groups to conduct appropriate extension activities in their own region. Individual groups could also use these funds for study tours of other NSW Dairy regions to observe the outcomes of their projects. These exercises will be valuable in reaching those farmers unable to participate in the project, and consolidating the learning of those involved in the project. The research team are also committed to publishing the results in relevant industry journals and newsletters, as well as workshops and seminars where appropriate._

_Symposiums are planned at the end of the second and final year of the project. These will provide opportunities for those involved to discuss results with others, both people involved in the project and those not. Such symposiums will be cost neutral, utilising existing field days or obtaining industry sponsorship. The communications budget will be used to produce reports which will be available at the symposiums._

(Dairy Australia 1996)

4.1.8 PPP aims, objectives and outputs

Collaboration amongst the PPP organisations ensured that project aims, methods and principles (Box 9) originated from farmer input, but developed in conjunction with industry, academia and government.
Box 9: Aims, objectives and output of the Profitable Pastures Project.

**PPP Principal Aims:**
- Establish the range of feedbase management systems and enable farmers to identify current limitations and issues confronting these systems.
- Conduct farmer-participatory research to address specific feedbase issues.
- Improve farmer confidence to assess the suitability of various practices for adoption in order to improve profitability.

**PPP Objectives:**
- To develop an understanding by farmers and service providers of existing feedbase management systems and their effect on productivity in six regions of NSW by working with thirty farmers in each region. This will be achieved through surveying thirty farmers in each region, then selecting up to ten farms within each region for monthly monitoring.
- To work with these farmers to identify current limitations and potential for improvement in feedbase management. This will lead to a greater awareness among farmers of limitations in their pasture production, grazing management and supplementary feeding, and may lead to identification of issues requiring future research.
- To develop farmer confidence in assessing the suitability of knowledge and technology relating to feedbase management to improve the milk production from pasture-based systems by 10% in 10% of NSW dairy farms. This will be achieved through working with discussion groups in on-farm research and extension in each region. In this case farmers will be actively learning as they make decisions.

**PPP Output:**
The primary output of the project will be improved regional-specific feedbase management systems. However, the methodological approach to the work (ie farmer involvement in the research process) will itself be an output. The formation of localised discussion groups (where not already in existence) will provide an ideal medium on which to base future research and extension programs.

(Dairy Australia 1996)

### 4.1.9 Logistical constraints to contact with farmers

Given the large geographic coverage of PPP, meeting farmers face-to-face on a regular basis proved difficult, particularly in terms of time and travel resources. Visits to each Regional Dairy Group usually required an overnight stay, with many requiring more. Visiting all Regional Dairy Groups consecutively took approximately 6 months, meaning that only two visits per year, on average, were feasible.

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2 The geographic area of PPP is more than double the size of Victoria’s combined dairy regions.
The reasons for a six-monthly visiting schedule included: finding mutually agreeable dates between the PPPLT and farmer groups; finding mutually agreeable dates for the PPP Coordinator and student to both attend (and occasionally other PPPLT members); clashes with dates on which the whole PPPLT met; lengthy travelling times; financial constraints on travel costs; and avoiding clashes with other industry events such as seasonal on-farm work (calving period, silage making etc) and other industry meetings, (conferences, deregulation meetings, processor workshops etc).

All visits to Regional Dairy Groups were pre-arranged by the coordinator and/or student. Having gained consent for PPPLT members to attend local meetings, or to hold a specific PPP meeting, a mutually acceptable date and time was established (either by phone or face-to-face at industry meetings), along with an indication as to how much time the PPPLT would have to address farmers directly.

4.2 Experiences from the field
This section analyses activities and experiences of PPP across both Phase 1 and Phase 2.

4.2.1 Phase 1: positive first steps
*Stage One: Ask* was PPP’s first public foray into the NSW dairy industry. It consisted of focus group meetings facilitated by the PPPLT with each Regional Dairy Group. During this encounter, which was the first introduction of PPP to NSW dairy farmers, the concept of AL/AR was presented and the PPPLT had an opportunity to *listen* to what farmers believed were their most important learning and pasture management needs.

These initial engagements with farmers resembled Greenwood and Levin’s (1998, p4) requirement that *the first step professional action researchers and members of a community or organisation take is to define a problem that they seek to resolve.*
They begin by pooling their knowledge. [AL/AR] democratises the relationship between the professional researcher and the local interested parties.

The PPPLT encouraged farmers to be pro-active with PPP resources. The main message of the first round of Stage One: Ask meetings with farmers is paraphrased (in the voice of the Phase 1 coordinator addressing a farmer group) as follows:

PPP is your project, the PPP funding is now your money, and what benefits you derive from PPP is largely dependent upon the extent to which you (farmers) make your own local activities happen. PPP farmers are not alone in this endeavour because there are resources and expertise of the PPPLT to draw upon, including technical and strategic support from NSW Agriculture officers, the resources of two universities, DIDCO, and professional links to approach other organisations external to the PPPLT. The difference with PPP activities is that farmers will have the opportunity to lead and drive the research. Now, what do you feel are the important issues on your farm, and what do you think would be a good use of your PPP money and resources to improve your farm and others like it? (Diarised Journal)

The final PPP report (Dairy Australia, 2003, p14) provides an insight to the context and state of the Regional Dairy Group network during the early stages of Phase 1, and how the PPPLT responded to these conditions.

The Regional Dairy Group network [as instituted by Dairy Australia] was in its infancy when PPP began in February 1999. This meant PPP was faced with differing scenarios of group dynamics within each DIDCO region. ... At the start of Phase 1, the Regional Dairy Groups ranged widely in their levels of group function in terms of farmer participation, motivation and energy, available operating resources, ability to access additional resources, frequency of group meeting, group actions taken or supported, projects conducted and vibrant farmer discussion forums.

On one extreme end of the spectrum were some Regional Dairy Groups that existed in name only, conducting a predominantly administrative function to DIDCO run by a couple of key farmers or associated stakeholders, while the other end of the spectrum had strong levels of farmer input to Regional Dairy Groups that serviced a wide variety of local needs, including farmer discussion groups, delivery points for industry projects, access to government advisory services, accessing additional resources, as well as constructive relationships with milk processors and other agricultural service providers.

PPP approached all Regional Dairy Groups by first and foremost seeking to work with the pre-existing group, regardless of its level of robustness and state of health. The PPPLT was aware that each Regional Dairy Group had its own internal order and that pre-existing local power structures, formal and informal, needed to be respected, especially when approaching Regional Dairy Groups for the first time. Although the PPPLT was mindful of its own farmer-oriented agenda, after engaging with each Regional Dairy Group the PPPLT sought to either enhance farmer-driven group processes that were already in place or, in cases where group dynamics were non-existent, set about establishing group-oriented farmer forums from scratch.
The first round of focus group meetings were deemed successful by the PPPLT. This was based on:

- good numbers of farmers attending focus group meetings (most or all local dairy farmers, or in larger regions between 10-40 farmers attending);
- facilitated farmer discussion on pastures;
- prioritisation by farmers of discussed research issues;
- qualitative data collected, collated, standardised, returned to Regional Dairy Groups and validated;
- introductory concept of AL/AR not rejected, and farmers seem open to the notion;
- PPP and the PPPLT were warmly received by farmers.

### 4.2.2 Regional Dairy Group data
A sample of one Regional Dairy Group’s data is provided in Figure 10. This sample is representative of the data that the PPPLT collected and collated, and is evidence of the extent to which farmers were encouraged to determine their own local project agenda and development.
Figure 10: Sample of Regional Dairy Group data

<table>
<thead>
<tr>
<th>Issue</th>
<th>What You (Farmers) Said</th>
</tr>
</thead>
<tbody>
<tr>
<td>PPP Projects</td>
<td>• Farmers as a group have to run PPP.</td>
</tr>
<tr>
<td></td>
<td>• PPP project could be investigation of specific varieties of grass for our region.</td>
</tr>
<tr>
<td></td>
<td>• PPP project could be finding out what is the best model/system for each farm, ie litres/ha or t/cow farming. In other words getting the pasture mix right on farms, especially with deregulation around the corner.</td>
</tr>
<tr>
<td></td>
<td>• PPP project could be research into lucerne, eg trials on farm, alternative varieties.</td>
</tr>
<tr>
<td></td>
<td>• PPP project could be on how best to fit corn into our pasture program and grow it.</td>
</tr>
<tr>
<td></td>
<td>• PPP project could be trying to find a year-round pasture species.</td>
</tr>
<tr>
<td></td>
<td>• PPP project could be trying to find the easiest and quickest way to monitor pasture growth, eg look into computerised plate meters.</td>
</tr>
<tr>
<td></td>
<td>• PPP project could be looking into what pasture-related computer software is available and how we could use it on farm.</td>
</tr>
<tr>
<td></td>
<td>• PPP project could be trying to learn more about when to apply fertilisers.</td>
</tr>
<tr>
<td></td>
<td>• PPP project could be reviewing what dairy research has already been done that is relevant to our region, but is still sitting in university filing cabinets (this will probably be done outside of PPP).</td>
</tr>
<tr>
<td></td>
<td>• PPP project could investigate the role of irrigation in dairying into profit, to work out if irrigation is worthwhile.</td>
</tr>
<tr>
<td></td>
<td>• Most of us think the PPP focus group meeting was good to generate discussion about farms and farming especially in terms of gaining knowledge of practices in my region.</td>
</tr>
<tr>
<td></td>
<td>• The problem with the existing information base is that it is Vic/NZ based and we need NSW and region-specific research.</td>
</tr>
<tr>
<td></td>
<td>• Focus farms are a good idea but I am not volunteering.</td>
</tr>
<tr>
<td>Limitations</td>
<td>• The poor quality of kikuyu limits our pasture use and we don't have a very good year-round rye grass for the Camden climate.</td>
</tr>
<tr>
<td></td>
<td>• We are not sure if we know enough about pastures, ie we are limited by our lack of knowledge.</td>
</tr>
<tr>
<td></td>
<td>• We are limited by our exposure to existing research and information about dairying, eg research is sitting in university filing cabinets.</td>
</tr>
<tr>
<td></td>
<td>• We are limited by what our soil types are capable of.</td>
</tr>
<tr>
<td></td>
<td>• We are limited by ourselves by not linking pasture utilisation with grain utilisation.</td>
</tr>
<tr>
<td></td>
<td>• We are limited by not knowing enough about the interface between supplements, pasture and the cow.</td>
</tr>
</tbody>
</table>

(Jennings et al. 2000a)

4.2.3 Dilemma (1): Blurred concepts of learning and research

Considerable internal debate over the meaning of research against that of learning shaped the PPPLT’s conception of Action Research and Action Learning during the early period of Phase 1. This debate was critical because it directly influenced the form of AL/AR delivered to farmers in PPP.
The PPPLT members each had their own understanding of AL/AR leading to a diversity of opinion as to what its merits and weaknesses were. Jennings and Packham (2004, p9) characterised the blurring of the concepts of Action Learning and Action Research as follows.

Amongst the PPPLT, discussions about the theoretical definition of [AL/AR] and how it would best be delivered as a process for use by dairy farmers revealed that [AL/AR] was not a uniformly accepted and understood concept, and its meaning was, to say the least, ambiguous. Observation of these discussions identified that the term [AL/AR] was interchangeably referred to as a method (a way to act) and as a methodology (principles to guide action). An assessment of the PPPLT’s early definition of [AL/AR] included the following aspects, simultaneously:

- The discretely defined steps of the [AL/AR] cycle were generally considered to constitute method, while principles of [AL/AR], such as democracy; learning by doing; single, double and triple loop learning (King 2000); social justice and equality of status amongst participants; acknowledgement of power relationships, etc, held connotations of methodology.

- To varying individual tastes, [AL/AR] existed somewhere on a spectrum ranging from a single individual’s experience to a community of practice, sometimes in a mutually exclusive fashion and at other times simultaneously. To the former [AL/AR] was an intensely personal experience for achieving individual goals and developing one’s own capacity, while the latter believed [AL/AR] existed in the public domain to promote social justice. For some [AL/AR] was a mixture of both.

- [AL/AR] was narrowly expressed as a mechanical exercise of implementing the four-stage cycle of plan-act-observe-reflect, while others promoted [AL/AR] as an organic process that could accommodate unforeseen events and facilitate changes in agenda priorities that were a natural part of any project and indeed of life itself.

- The [AL/AR] cycle was believed to hold properties that ranged from a discrete process targeted to specific action, to being a continuous process that was beneficial on several levels, including to individuals, combinations of individuals within groups, an entire group of [AL/AR] participants, stakeholders outside the [AL/AR] group affected by externalities, as well as the institutions participating in [AL/AR].

- Doubt was expressed as to the effectiveness of [AL/AR] as some questioned its theoretical basis relative to that of traditional scientific process, or felt [AL/AR] was co-opting the term research.

- Distinctions were made between Action Research and Action Learning, with peer review and adaptability of results to other situations being unique to [AL/AR].

Evidently, the … definition[s] of [Action Learning and Action Research] meant different things to different people depending on their construction of reality, experience, ideological basis (such as positivism, constructivism, etc), and the context into which [Action Learning and/or Action Research] was to be applied. From the observer’s perspective, a high level of variation, inconsistency and interchangeability of the elements and definition of [Action Learning and Action Research] was identified as a major barrier to effectively applying such methods to the NSW dairy industry.
It became clear to me that literature on AL/AR was itself inconsistent and variable in emphasis.

**Response (1): Differentiating AL/AR**

Midway through Phase 1 the PPPLT agreed upon reDefinitions that distinguished Action Learning from Action Research. These are presented in section 4.2.4.

Defining Action Learning relative to that of Action Research enabled the PPPLT to better communicate concepts and approaches for enacting participatory processes itself, and amongst PPP stakeholders — especially farmers. It provided the PPPLT with consistent and accurate terminology to address PPP participants. Furthermore, distinguishing Action Learning from Action Research improved the accessibility of AL/AR language for people unfamiliar to PPP and participatory processes by employing a *common* meaning of learning contrasted with research.

Evidence of the communicative benefit of distinguishing between Action Learning and Action Research was clear when PPP entered Phase 2. At this juncture, the Phase 2 coordinator was powerfully advantaged by being able to accurately and consistently state to farmers (and other PPP players) that Phase 1 had successfully achieved Action Learning, while Phase 2 was aimed at achieving Action Research. Moving to Action Research was expected to be built on the learning experiences of Phase 1, by challenging farmers (in Phase 2) to improve the intellectual rigour of their projects using Action Research. This progression from learning to research-oriented activities made sense to farmers and agronomists alike, was an exciting prospect for many farmers to pursue, and simultaneously met the PPPLT’s project aims and objectives.

**4.2.4 Dilemma (2): Content versus process**
The initial PPP proposal to Dairy Australia indicated that Focus Farms would be established in each Regional Dairy Group (Box 9, first objective) to provide the forum for farmer learning and research activities. As PPP engaged with farmers,
the PPPLT was struck by a blatant contradiction: by delivering AL/AR method to farmers they would be *emancipated* from their traditionally low level and passive participation in industry research and development processes, but the very same farmers could only reach this PPP-induced state of *enlightenment* if they followed the PPPLT’s desired agenda of Focus Farming.

This placed the PPPLT in a quandary because it took seriously the democratic values of AL/AR, and refused to simply over-ride or negate farmer’s perception of what group structures they wanted, even if this meant displacing PPPLT strategy. This was despite the fact that the PPPLT had the administrative power to control project operations and, for example, could have re-assessed funding arrangements to farmers to be contingent upon the unilateral establishment of Focus Farms across the Regional Dairy Groups.

**Generalisation of Dilemma (2)**

This somewhat paralysing dilemma became recognisable in more general terms as the PPPLT struggled to determine a theoretically and practically appropriate level of intervention into farmer behaviour. This problem resonates with Rowan’s relation of *alienation* and *social change* regarding different research styles (Figure 11), noting that PPP was intended to be located toward the bottom of Rowan’s scale, and hence equated with a high degree of social change.
(Rowan 1981)
The issue of what level of farmer-driven agenda was appropriate within PPP became to some extent an unsolved riddle during the latter half of Phase 1, with Jennings and Packham (2000, p6) characterising the situation in PPP as follows.

Given the desire of the funding body [Dairy Australia] to learn about improved ways of researching dairy pasture production, how far can the project [(PPP)] drift from its focus on pastures if the groups decide that this is not the main issue? A firm adherence [(to Dairy Australia’s desire)] would mean adopting only a technical [AL/AR] stance, while a practical or emancipatory [AL/AR] approach might lead to improved lifestyle and financial returns to the farmers [as a result of possible outcomes of non-pasture related activities].

Phase 1 response to Dilemma (2)
PPPLT deliberations on how farmers should engage with PPP and conduct AL/AR culminated in withdrawal of the expectation that all Regional Dairy Groups would establish a Focus Farm. Instead the Focus Farming concept was promoted by the PPPLT at its first farmer conference, where documented evidence showed that Focus Farming may suit some farmers in some regions but not in others. In instances of the latter, alternative farmer participatory discussion forums were strongly encouraged.

During Phase 1 the PPPLT believed that each Regional Dairy Group must have
some form of group-based farmer forum to put AL/AR into practice. Without group forums PPP did not exist. As a result PPP assisted every Regional Dairy Group to either:

- set up a new Focus Farm or similar discussion forum, or
- support and enhance pre-existing discussion forums.

By acting this way the PPPLT contributed to the creation of new social capital, or increasing existing stocks in the form of farmer-run learning forums. Now the challenge to farmers was how effectively they could use their social capital within an AL/AR framework to their benefit on-farm. The PPPLT left this challenge entirely in the hands of farmers, at least for the remainder of Phase 1.

**Dilemma (2) expressed in terms of AL/AR**

*Stage One: Ask* achieved the most notable outcome of Phase 1: the establishment and/or enhancement of farmer group forums within each of the six participating Regional Dairy Groups (one Regional Dairy Group delayed its involvement). This in itself seemed a superb achievement, and the PPPLT believed it could, and in accordance with Emancipatory Action Research theory should, withdraw its direct input to Regional Dairy Groups and simply wait to hear from farmers as they achieved learning and research results from local, PPP-funded activities.

Disappointingly, and surprisingly to the PPPLT at the time, farmer-run activities did not subsequently take off, and evidence of AL/AR being embraced by farmers was minimal. This was depressingly obvious when budget estimates (collected at the start of Phase 2) showed that overall less than half (48%) of distributed PPP money had been spent, or allocated to be spent in farmer proposals, across the Regional Dairy Groups over the full three years of Phase 1.

This financial statistic indicated an obvious lack of farmer-run activity, while the situation could have been interpreted as somewhat worse because the PPPLT had intervened in some Regional Dairy Groups to induce some of their spending.
These interventions included guiding Regional Dairy Groups to conduct soil tests, purchasing pasture measurement tools on behalf of farmers, and hosting a high profile pasture expert to conduct workshops with Regional Dairy Groups.

The PPPLT was concerned about the lack of Regional Dairy Group activity, but similarly remained gripped by a concern for being democratic and allowing groups to take action when and how they saw fit. It was commonly expressed (within PPPLT discussion) that the groups should not be kick-started or hand-fed by excessive PPPLT intervention because they could become reliant upon others to conduct local activities — the exact tradition PPP aimed to change.

As far as implementing AL/AR was concerned the PPPLT did not consider groups to be healthy, self-motivated agents of change (for the better) if they were not functioning in an autonomous fashion. Although setting up farmer groups was a difficult task in Stage One: Ask, the PPPLT did not consider that they should by continuing to lead farmer behaviour beyond a minimal administrative level. AL/AR was not considered to be occurring if the Regional Dairy Groups were not taking responsibility for their own participation in PPP and actually doing pasture-related learning or research activities.

After the Stage One: Ask round of meetings with farmers, the PPPLT decided (unanimously) that insisting farmers adopt AL/AR methods was untenable and that the adoption by farmers of AL/AR processes must rather be emphasised once each group had become more active and at least recognised the source of support PPP activities. This decision signalled an acceptance (amongst the PPPLT) of the idea that content of farmer actions must be allowed to take precedence, at least initially, over the type of processes they used.

The PPPLT believed that it would be more effective in pro-actively engaging Regional Dairy Groups to embrace AL/AR once they had embarked on the doing part of their local projects. In most cases, the level of action required by a Regional Dairy Group before the PPPLT expected to explicitly introduce AL/AR
was the completion of a small project (such as soil test interpretation), or the first stages of a larger project (such as a pasture trial).

The four farmer-friendly stages of PPP (Box 7, above) were no longer promoted to the Regional Dairy Groups. These four stages were dropped because the PPPLT now believed they failed to accurately replicate AL/AR method. An indicator for this was that groups did not appear to be emulating, or likely to implement, any of the stages beyond Stage One: Ask (Diarised Journal 1999). Despite the postponement of AL/AR delivery to farmer activities, AL/AR remained the central methodology and method for operating PPP within the collective mind of the PPPLT, for application to its own operations and that of future Regional Dairy Group activities.

Within this unanimous support for using AL/AR, the PPPLT differed internally on aspects of AL/AR, which had increased the PPPLT’s uncertainty about delivering AL/AR during Stage One: Ask. If the PPPLT could not agree on what AL/AR was and how it could be used, how could farmers be expected to embrace it? Roberts (2001, p13), who independently reviewed Phase 1 of PPP, noted that:

*The fact that the leadership team disagrees about some aspects of the implementation of the action research cycle may have affected the way group members in general interpret action research for themselves. The lack of clarity about what is action research among respondents to the telephone interviews may be an indicator of this uncertainty.*

In addition, Roberts (2001, p7) asserted a key challenge to the PPPLT for Phase 2, based on its Phase 1 performance: *The action research process underpinning the project should be made more overt.*

**Consequences of dilemma (2)**

Amid an array of dialogue about the meaning and application of AL/AR the PPPLT’s documentation of its own project plans, actions, self-reflections and observations as an AL/AR group fell away in the second half of Phase 1. This occurred in a manner that was not consciously agreed, nor formally recognised until the end of Phase 1 (Diarised Journal). Evidence of this was the cessation of
documenting minutes of PPPLT meetings, which had earlier been diligently and enthusiastically practiced and circulated to members.

My diarised account is supported by Roberts’ (2001, p14) external evaluation which states:

_The leadership team decided, on reflection, to decrease the emphasis on the implementation of action research within the project. They decided that an emphasis on content was more important than an emphasis on process. They also decided that the establishment of focus farms in all regions was not achievable and that these farms would be established as it became possible to do so, time, resources and willing farmers allowing._

_The leadership team is aware of the steps of the cycle and documentation of the critique of its practice has largely fallen to Jess Jennings who is collecting data for his PhD thesis. Some further documentation took place through the minutes of meetings. Actions and observations are recorded but not necessarily as part of the leadership team’s action research or action learning practice. For example, proposed modifications to the use of the cycle were mentioned in the minutes of a meeting in June 2000 but their follow-through was not documented._

Although it was in my PhD research interest to document the behaviour of the PPPLT, it was never a formal responsibility of mine (as PhD student or as a PPPLT member) to record meeting minutes. Rather, I provided an assumed default data gathering service for PPPLT events. In particular I recorded an historical log of each Regional Dairy Group’s activities, as well as observations of the behaviour and thought lines of the PPPLT.

**Data gathering and quality of Regional Dairy Group activities**

Some activity information was formally supplied (to the PPPLT) by a few Regional Dairy Groups, although data inconsistency and an overall poor quality of written reports heavily discounted its value for the PPPLT to assess progress and the practice of AL/AR by farmers. These strands of data from the Regional Dairy Group and my personally sourced records were compared, discussed and validated where appropriate, usually by conversation or email with the Phase 1 coordinator and other PPPLT members. These records formed the basis of milestone reports to industry.

Based on these observations I recognised that _reflection_, in the AL/AR sense,
continued to occur within the PPPLT, but because it was no longer formally documented members relied on their individual and group memory to verbally recount past events on an ad hoc basis. As a result, the PPPLT capacity for reflection had become constrained to the capacity of people’s memory.

Phase 2 response to Dilemma (2): Content then Process
At the commencement of Phase 2 the PPPLT’s conception of AL/AR was reconfirmed as Jennings and Packham’s (2000) distinction between Action Learning and Action Research, as stated in Dairy Australia (2003, p11):

*In essence, the PPPLT was in broad agreement that Regional Dairy Groups were engaging in Action Learning if they conducted activities that utilised previously established, reliable knowledge, such as soil test procedure, pasture measurement, chemical properties of fertilisers, established pasture growth rates etc. But when a Regional Dairy Group generated new classes of data or localised data that was additional to existing knowledge, the group was engaged in Action Research, but this was conditional upon the Regional Dairy Group results being novel and relevant to the direct participants and a wider audience after peer review.*

The Phase 2 approach to delivering AL/AR to farmers was notably different to that of Phase 1. In Phase 1 the PPPLT had been reluctant to conduct activities on behalf of farmers because it wanted self-motivating, autonomous farmer groups that were not spoon fed by the PPPLT for ideas, or the initiation of activities, to improve farm profit. In Phase 2 the PPPLT was aware of the delicate balance between intervention and leaving a group entirely to its own devices, with Phase 1 experience indicating that the latter would not produce any significant resulting action or outcomes at all.

For Phase 2 the coordinator was granted leeway by the PPPLT to act as an *initiator* with Regional Dairy Groups, and especially for organising funding allocations under new Phase 2 rules. This position, combined with a fulltime commitment to PPP, enabled the Phase 2 coordinator to stimulate farmer groups to generate proposals for their Phase 2 funds, particularly before PPP ended (in less than 12 months time).

*As an initiator within farmer groups the Phase 2 Coordinator often linked key*
people together to *germinate the seeds of ideas* raised by farmers. Once a sound project proposal had secured its funding from the PPPLT the Phase 2 coordinator immediately withdrew. This was not a surprise to farmers as they had been explicitly informed this would happen and when it was likely to occur.

4.2.5 Dilemma (3): Farmer reflection versus industry transparency
The four farmer-friendly stages of PPP (Box 7) were no longer implemented after *Stage One: Ask*. Instead *Stage Two: Watch & Measure* began in name only, and for most groups became a mixture of all four stages rolled in together. The Phase 1 Coordinator is quoted in Roberts (2001, p.14):

> The documentation of the [AL/AR] cycle remains an issue and I agree that there needs to be a stronger focus in the future on collecting and documenting. The final [Phase 1] report ... may go some way towards documenting the project activities.

The AL/AR requirement to reflect on actions and their consequences coincided with the dairy industry’s desire to monitor and evaluate farmer activities. Throughout Phase 1 obtaining documented farmer reflection proved almost insurmountable to the PPPLT. The issue of what constituted reflection in an AL/AR sense consumed hours of discussion and deliberation. A multitude of questions arose, such as:

- How should farmers reflect?
- What evidence of reflective practice should be required from farmers?
- What type of evidence should be required from farmers that demonstrate their reflective practice (for example, written, oral, visual, or audio-based forms)?
- Are local facilitators or *champions* of AL/AR necessary, and if so, who should they be?
- Should farmer groups reflect at regular points in time (such as monthly, annually etc), or only when the reflection stage arrives in their activities (that is, after *observing* and before *planning*)?
- Should all PPP participants record their personal reflections?
- Should each step or just the reflective element in the AL/AR cycle be reported?
- Should farmers design their own *reflection reports* or should the PPPLT provide a standardised *pro forma*?
• Was it reasonable to assume farmers were adequately skilled to design their own reflective process and documentation?

Central to these uncertainties was the issue that farmers must, in some way, demonstrate their reflective practice to the PPPLT so it could in turn report the value of PPP and its AL/AR method to industry.

**New industry transparency measures increase complexity**

During the period of this dilemma within PPP, Dairy Australia ushered in a new monitoring and evaluation program to *determine the value and effectiveness of stakeholder participation in the identification, development and implementation of projects and other activities undertaken by DIDCO* (DIDCO 1999, p3). This extended industry transparency mechanisms to formally include qualitative techniques to capture the process and sociological aspect of projects, and coincided with the PPPLT’s own attempts to capture qualitative data in the form of farmer reflection using AL/AR.

This coincidence led the PPPLT to contribute to DIDCO’s *Monitoring and Evaluation Sub-Committee*, with PPP’s impact being twofold. The Phase 1 coordinator of PPP and myself, as a student of AL/AR and extension, directly contributed to DIDCO’s strategy for improved project accountability, while indirectly the PPP culture of promoting participatory processes, and associated techniques, had some influence on the DIDCO Executive in favour of collecting standardised qualitative data to achieve industry transparency (Diarised Journal 1999).

Evidence-based evaluation of project processes was now a common cause for the PPPLT and Dairy Australia through its implementation of the DIDCO’s *Monitoring and Evaluation Strategy*. The effect of this commonality was to increase the complexity and compound the PPPLT’s responsibility to observe farmer behaviour. This increase in the demand for reporting local Regional Dairy Group activity processes distracted the PPPLT from devising its own project-
based strategy. The PPPLT was now conscious of aligning its own monitoring and evaluation strategy with that of the dairy industry.

Regardless of these contorting factors, reporting the progress of PPP by the PPPLT was necessary to meet professional standards of transparency and accountability to Dairy Australia. In doing so the PPPLT reported project milestones directly to Dairy Australia and also submitted copy to the DIDCO Executive.

By the end of Phase 1 the structural mechanism for farmer reporting within PPP was unclear. Attempts were made to devise a pro forma for farmers to fill out as their local activities unfolded, but this approach was brief and soon abandoned. As a result the PPPLT had a poor stock of farmer reports of PPP activities and was heavily reliant on anecdotal evidence from conversations with farmers and NSW Agriculture field officers and documented by the PhD student.

This situation meant the PPPLT did have a rough picture of how farmers were responding to PPP as a project, but the information that informed this picture was often second or third-hand and based on singular accounts of an issue or project. Consequently, the PPPLT did not have a comprehensively informed view of the state of PPP in each region, nor did it have the mechanisms to facilitate the collation of formal, standardised reporting by PPP participants. By the end of Phase 1 the PPPLT was even unsure as to exactly what PPP funds farmers had spent and on what activities. Roberts’ (2001, p7) evaluation of Phase 1 identified this issue, with a key suggestion being:

A structure of reporting the results of the project should be used that reinforces an awareness of the action research cycle and allows for its assessment.

**Phase 2 response to dilemma (3): Farmer reflection as industry transparency**

At the beginning of Phase 2, in regard to farmer application of AL/AR and monitoring and evaluation of PPP activities, the PPPLT agreed upon the following (noting that by Phase 2 DIDCO had finalised its Monitoring and
Evaluation Strategy, and instituted the use of a Small Projects Application Form and complementary Monitoring and Evaluation Form):

[In Phase 2 of PPP], farmers [were] required to demonstrate that the components of AL/AR ... were present in their processes. To ensure this outcome was achieved the PPPLT abandoned all previous forms and pro forma designed to capture the AL/AR process in favour of simplified versions of DIDCO’s Small Projects Application Form and corresponding Monitoring and Evaluation Form. This documentation requirement, in combination with the PPPLT understanding of each specific group, their level of functioning and their efforts to improve their situation, became PPP policy at the outset of Phase 2. Of critical importance was the process of participants reflecting, as individuals and as collectives, either consciously or unconsciously. Reflection was considered valid when an individual or group verbally expressed their reflections to the PPPLT, either in writing or discussion at their local learning forum (e.g. focus farm, or discussion group), or through presentation of results to wider audiences, such as PPP facilitated conferences (Dairy Australia 2003, p11).

There was no imperative or instruction for Phase 2 of PPP to use DIDCO’s forms, but given they essentially met the PPPLT’s requirements and no alternative mechanism within PPP existed from Phase 1, it was logical not to duplicate what DIDCO had established across the NSW dairy industry. To further their suitability for PPP purposes, the forms were modified to become simpler and branded with the Phase 2 PPP letterhead logo.

By adopting the above approach the PPPLT was able to meet its contractual obligations of project transparency, from management down to farm level, and simultaneously improve the extent and quality of AL/AR being conducted by farmers by ensuring reflection upon action.

4.3 Transformations from Phase 1 to Phase 2
1. Funding of Regional Dairy Groups
The funding arrangements for Regional Dairy Groups were changed in Phase 2, primarily because an internal audit revealed that almost half of PPP funds were not spent or earmarked for expenditure. Understandably, the PPPLT was concerned that additional Phase 2 funds to farmers might similarly not be spent. Consequently the PPPLT decided that Regional Dairy Groups with unspent carry-over funds from Phase 1 must spend or allocate their entire Phase 1 budget before applying to the PPPLT for Phase 2 funds.
Regional Dairy Group applications for Phase 2 funds were made by completing the *PPP Application Form* for PPPLT approval. These forms were a minimal administrative burden on farmers because the Phase 2 coordinator deliberately liaised with farmers about prospective projects, and these exchanges were relayed to the PPPLT to determine approval, rejection or approval subject to specific conditions. In practice all submitted applications to the PPPLT were approved, although several required significant improvements in their design or desired levels of farmer participation.

The changes made for the Phase 2 funding arrangements (Dairy Australia 2003, p36) were intended to:

- ‘wean’ the Regional Dairy Groups off the expectation of ‘free’ money,
- *increase the intellectual and scientific rigor of projects where possible,*
- *familiarise Regional Dairy Groups with industry expectations when applying for funds,*
- *familiarise Regional Dairy Groups with meeting the industry obligations of transparency and accountability,* and
- *familiarise Regional Dairy Groups with conducting their own monitoring and evaluation processes and documentation that amounted to reflective action.*

*This change in PPP funding policy meant the PPPLT was always updated, primarily through email, as to what new projects were being applied for by the Regional Dairy Groups and exactly what they entailed. The diversity of skills in the PPPLT meant that members could comment personally on Regional Dairy Group applications or suggest direct contacts for the Regional Dairy Groups to approach a superior level of expertise.*

## 2. Pasture to whole farm focus

A major change in PPP from Phase 1 to Phase 2 was a broadening of its original aim of improving the profitability of pasture systems within dairy systems. Dairy Australia suggested PPP become a whole-farm focused project, and this was gladly adopted. Farmer groups could now use PPP money for subjects across the whole dairy operation, and were not limited solely to pasture related activities. For example, in Phase 2 farmers could investigate such issues as milking shed performance, labour efficiency, business management techniques and tools,
effluent control, environmental issues, herd health etc, to either reduce costs or increase revenues on-farm to produce an increase in net profit.

3. Promotion of Action Research
Based on the PPPLT’s final agreed definition of Action Research (as distinct from Action Learning, defined in section 5.1) Phase 2 of PPP aimed to increase the intellectual rigour and scientific design of farmer projects, with a view to generating genuine research outcomes. This change of emphasis from learning to research encouraged farmers to think big in terms of the issues they could challenge and the projects they could muster.

This emphasis on research was an acknowledgement and reaction to Phase 1, which had facilitated instances of farmer learning but little progress in the way of research. Although Action Research was promoted in Phase 2, farmer projects based on Action Learning remained in the majority. Key differences in farmer’s activities from Phase 1 to Phase 2 were that project designs were better as a result of scrutiny by the PPPLT and they were distinguishable as Action Learning or Action Research.

On visits to Regional Dairy Groups the Phase 2 Coordinator suggested that farmers should use PPP resources as an opportunity to think laterally to tackle new or challenging ideas. To meet these challenges farmers were encouraged to increase collaboration with relevant research agencies. The intent of these messages was to expose farmers’ projects to expert input in order to achieve increased relevance and robustness of results than occurred in Phase 1.

4. AL/AR for individuals
Throughout Phase 1, it was assumed that all farmer activities were to be group-based, although in reality key people in each region were often doing the majority of the work that led to group learning. In Phase 2 it was accepted that AL/AR can and does occur at the individual level. In recognition of this the PPPLT agreed that individual farmers could devise and run their own projects using PPP funds,
with the following conditions attached:

- the individual farmer in question had to seek approval from the Regional Dairy Group that he/she was a member of, and
- the farmer had to report the project outcomes to the Regional Dairy Group.

This flexibility was in part designed to cater for farmers who felt uncomfortable doing group work, and to capture farmer ideas, motivation and action that originated with individuals but were likely to be withheld or undetected in group processes.

5. Increasing public profile

During Phase 2 industry recognition of PPP as a participatory project increased. This was the consequence of a considered marketing effort that produced a project logo that farmers could easily recognise, and complimented the verbal nickname of P-P-P that farmers had associated with during Phase 1. The Phase 2 logo (Figure 12), designed with the wording PPP: By Farmers … for Farmers, was used consistently as part of PPP documents, such as funding application forms, monitoring and evaluation forms, PPP letterhead, business cards for coordinator, milestone reports, conference proceedings, and web site images where possible.

Figure 12: Phase 2 logo of the Profitable Pastures Project.
When making verbal and written presentations about PPP, the Phase 2 coordinator preaced his contribution with an introduction that elaborated on the new PPP logo. This introduction was later realised to be synonymous with what Joan Tully (1967) had written about the context within which farmers’ operate (as quoted in Chapter 2). The Phase 2 Final Report (Dairy Australia 2003, p46) presented the project’s ethos and the coordinator’s preacing statement as follows:

Since its inception PPP has consistently upheld its core principle of increasing the role of farmers within local level learning and research processes in pursuit of on-farm and industry improvement. The importance of this principle is linked to the high level of regard the PPPLT has for farmer’s indigenous knowledge, life-long experiences and the fact they are the critical determinant of rates of on-farm technology adoption. Throughout Phase 2 this scenario has commonly been expressed by the following statement:

‘Farmers are expert managers of extremely complex systems that are commonly known as farms’.

This statement implies recognition that farmers are constant managers of a range of fluctuating variables that are inter related in a complex fashion, such as maintaining microbial populations within soil structure to balancing the social dynamics of the family farm.

This statement was an effective way of communicating to farmers that they were considered the main focus of PPP, not simply because they were farmers, but because they had highly valuable knowledge to contribute to industry development. In addition it gave a clear indication to non-farmer stakeholders involved in PPP, and to complete outsiders, that farmers were considered much more than passive end-user adopters of technology, or instruments that could be utilised to conduct researcher-driven industry projects.

The image of PPP was deliberately promoted more widely than in Phase 1, primarily to reach more dairy farmers, and secondly to grow existing awareness and support for PPP within the NSW dairy industry. To these ends, the Phase 2 coordinator contributed PPP material to regional newspapers and local and national radio programs to publish or publicise project events and outcomes.

4.4 Case Studies from the Profitable Pastures Project
This section provides case studies of three external events that impacted upon
PPP, two scenarios of non-participation, and the advent of farmer forums within PPP.

4.4.1 Externalities (three case studies)

Externality (1): PPPLT member departure
A partial explanation for the low level of awareness and practice of AL/AR in Phase 1 can be attributed to the departure of a key member of the PPPLT shortly after the Stage One: Ask round of focus group meetings. This member had been the driving force behind the use of AL/AR and he had brought knowledge of relevant theory, practice and personal experience to the PPPLT. This member’s presence imbued the PPPLT with confidence to deliver AL/AR to Regional Dairy Groups and largely regulated the PPPLT’s own usage of AL/AR. Without the authority of this member the PPPLT was significantly reduced in professional AL/AR expertise, but, perhaps more importantly, lacked a passionate advocate.

Consequently, the level of understanding and the professional capacity for use and delivery of AL/AR fell primarily to two students — myself as PhD student and the Phase 1 coordinator, who was undertaking a Masters course focused on AL/AR. Both of us were new to AR, except for our brief experiences within PPP. Under these circumstances the Phase 1 Coordinator and I were landed in a true state of Action Learning — we were attempting to achieve PPP’s ambitious and novel project outcomes by doing PPP. We were, in reality, enacting the sentiment that the best way to understand something is to try to change it. In this case we were Action Learning our way into an understanding of AL/AR, within the context of PPP.

Externality (2): Deregulation of the national milk market
Deregulation of the national milk market was a major pre-occupation for Regional Dairy Groups that further eroded the PPPLT’s confidence in foisting AL/AR onto farmers. Deregulation came into force on the 1st July 2000 (Wilkinson 1999), although the mood of milk producers leading up to this event was one of extreme uncertainty. Most were primarily concerned with trying to assess the viability of
their businesses post-deregulation, often by attending industry and government projects. This situation intensified competition for farmers’ time and attention, and thus the advocacy of AL/AR by the PPPLT appeared to farmers as a minor issue.

The PPPLT accepted farmers’ need to concentrate on the issue of deregulation and hence withdrew its promotion of PPP. In hindsight the PPPLT’s approach to *tread water* was vindicated because a sizable proportion of dairy farmers left the NSW industry — for these farmers there was clearly no point investing time in PPP or vice versa.

For farmers who remained in the industry, the PPPLT believed they would need a project like PPP more than ever in a deregulated environment, but their full participation in PPP would be contingent upon having made a firm decision to continue dairying. As a result it appeared that some farmer’s full participation in PPP was compromised primarily because of a pre-occupation with the essential operation of their businesses, or attempts to increase production through increased herd sizes.

**Externality (3): Drought**

Drought became a major factor during Phase 2 of PPP, with NSW experiencing what colloquially became known as *the worst drought in 100 years*. PPP farmers were taken away from their non-core business pursuits (such as running research projects with PPP), to concentrate on keeping their stock fed, watered and milked. With a high drought-induced price for purchased feed many farmers were again pondering the viability of their businesses, especially within the deregulated environment.

In response, the PPPLT had learnt from previous distractions, such as deregulation, and did its utmost to meet the learning and research needs of PPP farmers. This meant meeting farmers on their properties, rather than off-farm, working more after hours through telephone contact, and being patient and
accepting that action in some projects would have to be delayed until the pressures of drought were relieved.

4.4.2 Non-Participation (two case studies)
PPP commenced Phase 1 (in 1999) with six Regional Dairy Groups. Within these original six RDGs, there were two cases where participation was less than the PPPLT had hoped for. These cases are discussed below.

Non-Participation (1): Regional Dairy Group A
In Regional Dairy Group A, PPP was rejected from the very first meeting with the Phase 1 Coordinator, although the agenda was nothing more than a discussion session to introduce PPP and inform the Regional Dairy Group what funds were available. Although the PPPLT found it hard to fathom that any group of farmers would be rejecting the offer of free money to improve their profitability, this is exactly what happened.

Occasional contact with members of Regional Dairy Group A, and particularly other farmers from the region, began to shed light on why PPP was so emphatically rejected. The major barrier to Regional Dairy Group A was a single leader within the group, whose personal opinion dictated many of Regional Dairy Group A’s decisions, including abstaining from PPP. It became obvious over time that this view was not unanimous (Diarised Journal).

The local leader felt PPP could not contribute anything new to the region in terms of pasture research. It seemed clear to the PPPLT that obstruction to PPP occurred because of one person’s concern about their territory and power to influence the local agenda.

This issue is picked up in Jennings and Packham (2000, p4) and outlined as follows:

_The experiences from one PPP group revealed a 12-month exclusion of PPP from their region._
It was deemed beyond the control of the PPP Leadership Team to overcome this postponement, and it was not until local social and institutional structures changed that PPP was introduced through this group. Reflection upon this scenario suggested that participation within PPP was clearly perceived as having no potential benefit, or at worst, was threatening to the established modus operandi of the dairy farmers and their advisers in that region.

Eventually, the local leader chose to leave Regional Dairy Group A and this opened the way for the PPPLT to re-invite their participation in PPP. This opportunity was taken and the group became a full participant in all PPP events during Phase 2.

**Non-Participation (2): Regional Dairy Group B**

In Regional Dairy Group B active participation in PPP failed to emerge in Phase 1, although the conditions were of a different nature. The final report to Dairy Australia (2003, p21) stated:

> Throughout Phase 1 PPP did manage to establish its profile but no farmer-run group processes emerged. This region, from a PPP perspective was difficult to establish a regular and well attended farmer forum, despite several attempts to ‘kick-start’ the process through direct PPP facilitation and meetings to initiate autonomous farmer action. The reasons for this are varied, but there can be little doubt that the financial stress of deregulation was a major distraction.

> The social dynamics within the region seemed to stall the development of any continuous farmer forum, often characterised by a mismatching of attempts by PPP and NSW Ag staff with the expectations of farmers and their needs. Prior to PPP there was no formal discussion group in the region and it seemed after several years of the PPPLT trying, that perhaps this was for a reason and group activities were simply not suited to the local farmers, at least if it were largely left to the farmers to initiate and run them. [Regional Dairy Group B] meetings were generally attended only by a few key people, with other farmers not playing a role, and of those key players about half were farmers.

A partial explanation of the inability to get local activities going was offered by Jennings and Packham (2000, p6):

> In ... [Regional Dairy Group B] ...consistently low levels of attendance led to ... [participants of group formation meetings] ... feeling unjustified in making decisions without more potential participants present. Consequently, important issues for [Regional Dairy Group B] were continually 'tied-over' for future meetings, which then had a different group composition. This cycle repeated itself for approximately 12 months, despite frequently vocalised enthusiasm for PPP and the potential educational and economic benefits it offered. ... Intermittent group participation also appeared to increase the instance of speculation and doubt about project activities and goals that were previously agreed under the auspices of 'the group', directly contributing to less comprehensive investigation efforts.
In addition to poor attendance levels, deeper issues became significant causal factors in Regional Dairy Group B’s failure to become active. In total the Phase 1 Coordinator was expected to play out no less than five roles in relation to Regional Dairy Group B. These were as PPP Coordinator, PPP representative on the Regional Dairy Group B board, NSW Ag Livestock Officer, Secretary of the Regional Dairy Group B board, and as a local identity and resident in a small rural town where people saw each other frequently in their private lives. Personal conflicts arose, with the net effect that Regional Dairy Group B remained part of PPP in name only, although its Phase 1 funding remained intact.

A brief description of the outcome for Regional Dairy Group B in Phase 2 is provided by Dairy Australia (2003, p21):

At the beginning of Phase 2 a considerable effort was made by the PPPLT to get this region going, with the consequence of repeated failure likely to mean the reclaiming of PPP funds from past financial transfers to ... [Regional Dairy Group B] and exclusion from access to Phase 2 money. Fortunately the issue did not come to this, although it was discussed within the PPPLT. Instead a range of projects were identified, applied for, and successfully approved, and are now in operation or have been completed. Because of the lack of activity in Phase 1 it was deemed that [Regional Dairy Group B] would have to submit an application form for each project, regardless of whether it was using PPP Phase 1 or Phase 2 money.

By prioritising a list of projects and [the PPPLT] allocating funding to them early in Phase 2, [Regional Dairy Group B] went from being the most underspent Regional Dairy Group in PPP to having allocated 100% of its Phase 1 and Phase 2 funding – which was more than any other Regional Dairy Group at that time, which was all formalised in the course of one [board] meeting!

During the period in which the Phase 2 coordinator liaised directly with Regional Dairy Group B a range of communication techniques were employed, including telephone contact, farm visits, milk tanker deliveries, local newspaper articles and interview-announcements on the public and private radio. When it came to dealing directly with the Regional Dairy Group B board and key farmers it was clear that PPP still carried baggage from Phase 1 and reaching agreement on how funds should be spent was not easy. The PPPLT held a strong line with Regional Dairy Group B that PPP funds must be spent in accordance with the philosophy of PPP, particularly that activities be farmer-driven. After a series of sometimes tense negotiations the PPPLT was satisfied its basic principles were being met,
and although the Regional Dairy Group came to accept PPP’s approach it was clear they would not have acted the same way if given a choice.

Importantly, these events with Regional Dairy Group B were different in nature to the events in Regional Dairy Group A, but both resulted in limiting participation levels within PPP’s AL/AR processes.

4.4.3 Facilitated forums for dairy farmers (four case studies)
A primary aim of PPP was to create a forum within industry to support farmer-driven learning and research. The PPPLT approached this aim on several fronts by facilitating a range of forums that enabled farmers to determine their own learning and problem-solving research.

Facilitated farmer forum (1): Regional Dairy Group Teleconferences
Partly because of geography and partly because farmers requested to be informed about other Regional Dairy Groups activities, the PPPLT instituted a series of NSW-wide telephone conferences. Each Regional Dairy Group Teleconference was arranged, administered and paid for by the PPPLT, with each farmer usually being rung twice beforehand to establish and confirm a date and discuss any topics the farmer had in mind. Each teleconference was facilitated by the PPPLT and was kept to a strict time limit of one hour. A follow-up call from the PPPLT was often made to evaluate the farmer’s value of participation. No negative feedback was ever received. Several teleconferences were summarised by the PPPLT and returned to Regional Dairy Groups (by fax, post or email) for local dissemination.

Regional Dairy Group Teleconferences were a veritable PPP success. Communicating with all the Regional Dairy Groups at once, without incurring significant travel costs, was a major advantage. An average Regional Dairy Group teleconference cost $A300-$A500, where as a face-to-face group meeting of the exact same participants would have cost $A3000 - $A5000, depending on venue. More important was the efficient use of farmer’s time, with the average Regional
Dairy Group Teleconference taking a maximum of two hours to prepare for and conduct, while a face to face meeting typically involved an overnight stay plus approximately 2 days travel for many farmers. Figure 13 shows group participation/representation levels for farmer teleconferences over the life of PPP.

Figure 13: Participation levels at teleconferences and farmer conferences.

<table>
<thead>
<tr>
<th>Event</th>
<th>Regional Dairy Groups</th>
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<tbody>
<tr>
<td></td>
<td>1</td>
</tr>
<tr>
<td>Regional Dairy Group Teleconference #1</td>
<td>✓</td>
</tr>
<tr>
<td>Regional Dairy Group Teleconference #2</td>
<td>✓</td>
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<tr>
<td>Regional Dairy Group Teleconference #3</td>
<td>✓</td>
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<tr>
<td>Regional Dairy Group Teleconference #4</td>
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<td>Regional Dairy Group Teleconference #5</td>
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<td>PPP Conference #1 (1999)</td>
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<tr>
<td>PPP Conference #2 (2001)</td>
<td>✓</td>
</tr>
<tr>
<td>PPP Conference #3 (2003)</td>
<td>✓</td>
</tr>
</tbody>
</table>

na: not a part of PPP at the time  a: absent

(Value of Regional Dairy Group Teleconferences

This form of communication enabled the PPPLT to more effectively express its position on project matters and importantly put farmers in the position of being an information provider to fellow farmers. This role was ideal for many farmers because it did not require large preparation efforts, but did require farmer reflection on local activities by both the Regional Dairy Group and individual farmers.

An element of pride in representing the region also stimulated participating farmers, who became increasingly conscientious about local projects, improving their design quality, content relevance and their outputs and outcomes. Regional
Dairy Group Teleconference farmers developed a sense of community across NSW, which in combination with increased conscientiousness led to farmers fostering an attitude that they could actively help each other through the sharing of quality information.

Additionally, farmers were emotionally bonded to each other by discussions of weather patterns and the adverse impacts of negative externalities, such as drought and deregulation. This social support component was not an anticipated aim or outcome of PPP, so it was not explicitly monitored and evaluated, but it was clearly present to varying extents in a range of PPP activities.

The PPP Final Report (Dairy Australia 2003, p40-41) noted the following characteristics about Regional Dairy Group Teleconferences:

> Farmer responses to these teleconferences were always extremely positive, which was probably in part because they were kept strictly to one hour, unless farmers were willing to stay on the line. Because of the flexibility of teleconferences farmers took their calls in the dairy, on their mobile phone whilst working paddocks, on the side of the road if away from the farm, or from home or office. The content of the calls provided clear insight into a range of local on-farm activities across NSW and stimulated questions and discussion to almost every farmer representative. Productivity gains were included in the feedback about Regional Dairy Group teleconferences, with the [Farmer A] family at Wauchope taking fertiliser and weed spray advice from trials conducted in the Southern Highlands by [Farmer B] that led to vastly superior pasture establishment than any previous year at [Farmer A’s] farm.

In addition to Regional Dairy Group Teleconferences, the PPPLT facilitated many project-specific teleconferences. These were useful in scoping out projects and establishing a core team of individuals who would conduct the work. Introducing external stakeholders was often achieved with these teleconferences, with farmers and scientists and other professionals given the opportunity to question each other and establish the terms of reference for projects.

Invariably, external professional stakeholders (non-farmers) were invited to join Regional Dairy Group project teleconferences, but at the request of farmers with the PPPLT making contact. This enabled farmers to maintain a large degree of control of the project agenda. Other benefits of project-specific teleconferences
were similar to those of Regional Dairy Group Teleconferences. In several cases stakeholders from interstate were available by telephone, a situation which otherwise would not have been possible.

**Facilitated farmer forum (2): Virtual farmer networks**

During Phase 2 the PPPLT instituted a dairy industry listserver, known as DairyNSW. This list was based on a pre-existing Victorian model (*Vicdairy*) and was administered entirely by the Phase 2 Coordinator. DairyNSW provided an electronic forum within which farmers could send and receive email discussion about any professional matter. Although the list was targeted to farmer needs, non-farmer stakeholders in the dairy industry were encouraged to contribute.

In theory, the more diverse the membership of DairyNSW the more effective it could be at answering farmer questions and communicating industry information. In practice, DairyNSW was poorly utilised by farmers as active contributors, although most found it of value as an information source. The reasons for lack of farmer participation were outlined in an evaluation report that stated (DIDCO 2003, p3):

_The underutilisation of DairyNSW may in part reflect a relatively low email/internet usage within the NSW dairy industry, as well as an unawareness/unfamiliarity/reluctance amongst subscribers to exploit the full potential of email list server facilities. For DairyNSW to be successful in future it must:_

- Reach a wider farmer and industry audience (increase subscribers)
- Achieve active participation by subscribers (more discussion)
- Be utilised appropriately as an information management tool (no-one be frightened/annoyed to hit delete)

Despite the low level of success of DairyNSW, it represented a genuine attempt by the PPPLT to offer farmers their own domain for communication and inter-industry dialogue. Presumably the overall effect of DairyNSW was positive because an overwhelming majority of subscribers (farmers and non-farmers) stated it should continue, but in a modified form.
Facilitated farmer forum (3): PPPMenu
A further attempt to keep PPP farmers in touch with each other across NSW was the establishment of a one-page newsletter, called PPPMenu. This leaflet was a brief summary of current PPP activities across each Regional Dairy Group, providing each project’s title, contact person, region, and sometimes a brief description. PPPMenu could be emailed, faxed or posted to keep PPP farmers aware of what other areas were doing, and facilitated inter-Regional Dairy Group communications.

PPPMenu was considered useful by farmers and effectively satisfied the common Phase 1 farmer requests for more information on other Regional Dairy Group activities. This information leaflet provided PPP farmers with a sense of community within PPP, and contributed to greater appreciation of what other farmers were doing across NSW. By doing so, PPPMenu enhanced farmer interest in other on-farm projects and stimulated farmers to reflect on their own activities by way of comparison with other farmer-run PPP projects.

Facilitated farmer forum (4): Farmer conferences
Three farmer conference forums were hosted over the life of PPP, with the first two occurring Phase 1 and the third in Phase 2.

The first farmer conference
Focus Farming was the theme of the first conference with guest speakers invited from Victoria to talk about Being a Focus Farmer. The PPPLT harboured hopes that the FF concept would be embraced by all the Regional Dairy Groups so that PPP would have comparable AL/AR forums across NSW. The percent balance of farmers to non-farmers was approximately 50-50, with dialogue throughout the forum generally guided, and at times directed, by the non-farmers.

The second farmer conference
The second farmer conference heralded the end of Phase 1, and the farmer to non-farmer percentage ratio was about 60:40. The theme of this forum was simply to
get Regional Dairy Groups reporting to each other about what activities they had been undertaking with PPP in their local area. Additionally, several non-farmer presentations were made, but the prime focus was on farmer-to-farmer dialogue across different Regional Dairy Groups. Unfortunately farmers did not have a lot of PPP activities to report, so they tended to speak about general issues within their region and how they were being dealt with. Farmer presentations were mostly ‘off the cuff’.

The essence of these farmer presentations was compiled into proceedings by the PPPLT, and distributed to all Regional Dairy Groups. Notably it was PPPLT members or other non-farmers who composed almost 100% of the text of the farmer reports, and these were based on phone calls, conversations, notes from the conference and PPPLT knowledge of each Regional Dairy Group’s activities. The fact that most farmers did not supply their own text reflected the lack of activity and documented reflection occurring in PPP, which in turn indicated that the PPP strategy for Regional Dairy Groups to monitor and evaluate their own progress was non-existent by the end of Phase 1.

**The third farmer conference**
The third and final PPP farmer conference was held in the last months of Phase 2, with the experiences of the previous two conferences informing the planning and facilitation of the third.

Of particular interest to the Phase 2 Coordinator were observations from Phase 1 of farmer-to-farmer interaction compared with farmer-to-non-farmer interaction, at both individual and group levels. Observations were drawn from meetings with Regional Dairy Groups, where the overwhelming majority of participants were farmers but the non-farmers did most of the talking. This in turn seemed to create a mini-culture in which farmers resigned themselves to listening and non-farmers made the most of a captive audience. Farmers were sensitive to the conditions within which they spoke, with competition for talking time usually leading to farmer withdrawal from conversation, even if they disagreed with the content of
discussion. Alternatively, most non-farmers who regularly dealt with farmers were confident public speakers — for these people it was their job to speak in public to farmers and, in general, the larger the group the better (Diarised Journal).

The second PPP Conference provided similar evidence. Farmers were observed to gravitate towards each other during conference breaks (breakfast, lunch, dinner etc) and were clearly more relaxed, than when engaged with a non-farmer who was an identifiable industry, government, or academic type of person. During the discussion within conference sessions, it was obvious that the non-farmers were eager, confident and intent on asking questions and/or making their point known to the group. Alternatively, farmers were less confident and appeared slightly inhibited by non-farmers taking up much of the discussion space (Diarised Journal).

Farmers generally appeared less confident to ask what may be considered a silly question or even less likely to press a controversial point, while non-farmers were keen to ask any question that came to them regardless of what the individual or group response might be. In observing the second PPP conference it became clear that most farmers are not regular conference attendees, while the non-farmers were and they considered conferences as key learning and networking opportunities at which potential benefits could only be realised through active participation.

Based on a belief that farmers did behave differently in their own company, the third PPP conference was structured to have the highest possible farmer to non-farmer ratio; in this instance the percentage break up was 75:25. Involving more female participants became a priority, with female participation being 42% and 35% respectively in conferences two and three. For both forums farmers were encouraged to attend with their wives or partners, even bringing children if necessary, expecting that females would participate fully alongside males.
For the first time in the trilogy of PPP conferences farmers were expected to prepare their own presentations, providing hard copy to the Phase 2 coordinator before the event began in order to construct a concise proceedings document available at the conference. The professionalism and high standard of farmer’s one-page project summaries as well as their speaking presentations (often using unfamiliar communication technologies such as Power Point, overheads, microphones, lecterns, digital photographs, illustrations, and handouts) were considered excellent by the PPPLT and all conference participants.

The PPPLT noted that many farmers, even those experienced in public speaking, were quite nervous in making their presentations although, during question time, two-way discussions were all in-depth and strong. The reason for this probably lay in the fact farmer-presenters were for the first time taking centre-stage as information providers, they were talking to a farmer audience, that is, *their own kind*, who could not be easily fooled, there was some pride in representing the region they came from, and the work they had been doing actually mattered to them and their region, so presenting data and on-farm experiences was important both personally and as a contribution to industry.

Farmers commented on the value of having a proceedings document that provided enough information to know what each project was about and that doubled as a state-wide address book to follow-up information or farmer contacts (Dairy Australia 2003a, Diarised Journal).

**Summary indicators of farmer conferences**

Comparative indicators of the three farmer conferences are shown in Figure 14 with the Regional Dairy Group attendance levels for teleconferences and farmer conferences reported in Figure 13 (above).
Figure 14: Comparison of farmer conferences.

<table>
<thead>
<tr>
<th>Indicator</th>
<th>PPP Conference #1</th>
<th>PPP Conference #2</th>
<th>PPP Conference #3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Participants</td>
<td>18</td>
<td>36</td>
<td>38</td>
</tr>
<tr>
<td>Farmer Audience (%)</td>
<td>44</td>
<td>53</td>
<td>50</td>
</tr>
<tr>
<td>Farmer Presenters (%)</td>
<td>11</td>
<td>22</td>
<td>79</td>
</tr>
<tr>
<td>Non-Farmer Presenters (%)</td>
<td>33</td>
<td>19</td>
<td>5</td>
</tr>
<tr>
<td>PPPLT speakers (%)</td>
<td>56</td>
<td>59</td>
<td>16</td>
</tr>
<tr>
<td>Female Participants (%)</td>
<td>6</td>
<td>42</td>
<td>30</td>
</tr>
<tr>
<td>PPPLT Support to Farmers to Attend/Present (dollars &amp; resources)</td>
<td>High</td>
<td>High</td>
<td>Low</td>
</tr>
<tr>
<td>Farmer Input to Conference (dollars &amp; resources)</td>
<td>Low</td>
<td>Low</td>
<td>High</td>
</tr>
</tbody>
</table>

4.5 The Profitable Pastures Project in perspective

Phase 1: project design and implementation

Having taken the principle of farmer participation to heart, the PPPLT ensured farmers’ independence to construct the local PPP agenda, and design projects. This was coupled with the delivery of project resources to farmers through the Regional Dairy Group bodies. This allocation of resources provided *new space* within industry for farmers to express their learning and research needs, as well as forming ideas and strategies to meet these needs.

By the end of *Stage One: Ask*, the PPPLT was confident it had installed the necessary conditions for Regional Dairy Groups to progress their own AL/AR processes, as described by Jennings & Packham (2000, p6 citing Allen and Kilvington): *stakeholders [need to] develop a common understanding of the perceived issue, and collectively decide on the project goals and the different roles that groups will undertake. Building this climate for change is the single*
most important step in initiating any collaborative approach.

By the end of Phase 1 the prime PPP achievement was the enhancement of existing farmer groups or the creation of new ones, with all such groups imbued with a heightened value of farmer-driven learning and research. The level to which farmers chose to utilise the space provided by PPP, and drive their own forums of learning and research was realised in Stage 2, but the latter period of Phase 1 witnessed low levels of farmer-run PPP activity.

Although the lower than expected levels of farmer-driven activity had disappointed the PPPLT in Phase 1, its efforts did provide a fundamentally critical basis for progression in Phase 2. This key outcome is encapsulated in general terms by Kemmis (1981, p3):

The first step in action research turns out to be central: the formation of a communicative space...and to do so in a way that will permit people to achieve mutual understanding and consensus about what to do, in the knowledge that the legitimacy of any conclusions and decisions reached by participants will be proportional to the degree of authentic engagement of those concerned.

Transition from Phase 1 to Phase 2
The Phase 1 Coordinator resigned after the second PPP conference, and he remained a friend of PPP, providing input to Phase 2 as appropriate. Appointing the Phase 2 Coordinator took eleven months, after which Phase 2 formally began. During this interim the PPPLT attempted to stay in touch with Regional Dairy Groups by holding a farmer teleconference, although the operations of PPP were essentially on hold for approximately ten months until the Phase 2 coordinator position was filled.

This interim period negated much of the revived momentum from the second PPP farmer conference resulting in a significant period in which PPP farmers knew little about what was occurring within PPP management, although most probably assumed the project was to be continued.
Phase 2: delivering results to farmers

With a revamped approach to PPP, based on the learning experiences of Phase 1, the PPPLT approved a large number of Regional Dairy Group projects over the course of Phase 2, most of which the Phase 2 coordinator played a role in establishing. Evidence of increased farmer activity, as indicated by expenditure or allocation of PPP funds from Phase 1 to Phase 2, as well as the value of in-kind contributions that Regional Dairy Groups won from collaborating stakeholders, is shown in Figure 16. On average, each Phase 2 project was worth approximately three times that of a Phase 1 project, as can be gleaned from Figure 17.

**Figure 15: Total expenditure and in-kind support by Regional Dairy Groups.**

<table>
<thead>
<tr>
<th>PPP Phases</th>
<th>Regional Dairy Group (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
</tr>
<tr>
<td>Proportion of Phase 1 funds spent/allocated at end Phase 1 (100% = $25K)</td>
<td>100</td>
</tr>
<tr>
<td>Proportion of all Phase 1 &amp; Phase 2 funds spent/allocated at end Phase 2 (100% = $25 + $10K = $35K)</td>
<td>100</td>
</tr>
<tr>
<td>Additional in-kind contributions to Phase 2 projects as a proportion of Phase 2 dollar funding to Regional Dairy Groups (100% = $10K)</td>
<td>100</td>
</tr>
</tbody>
</table>

**na:** not part of PPP at the time

*Dairy Australia 2003*
Based on a mental collation of all PPP data sources and my personal understanding, the life of PPP is mapped in a schematic illustration in Figure 18. The X-axis represents time and although is not depicted to scale it identifies significant events within the life of PPP and links them to levels of *PPP activity* on the Y-axis. The Y-axis represents a low-high scale of project activity within PPP that is my combined perception of three aspects of project management:

- the level of Regional Dairy Group activity being stimulated by the PPPLT,
- the recognition and profile of PPP within industry as indicated by farmers’ awareness of, interest in and associated value of PPP,
- the PPPLT’s own levels of enthusiasm, project management activity and effectiveness in delivering PPP to industry.
Figure 17: Schematic illustration of activity levels within the Profitable Pastures Project.

Concluding comment
Chapter 4 has outlined the history of PPP, and, from my perspective as a participant-observer, provided deeper insights into a selection of events (case studies) from PPP in the field. The issues identified from these experiences form the starting point for research that is discussed in the following chapters.
Chapter 5 — Primary Tier Research: Learnings About the Application of AL/AR with NSW Dairy Farmers

*Writing and ploughing are two different talents and he that writes well must have spent in his study that time which is necessary to be spent in the fields by him who will be master of the art of cultivating them.*

Jethro Tull (cited in Prothero 1912, p111)

**Introductory comment**

This chapter grapples with the primary tier research (Figure 4, Chapter 1) issues that arose from PPP. In particular, various PPP experiences are identified as issues for discussion that led to on-farm results and practical learning about the delivery process and effectiveness of AL/AR as applied to the NSW dairy industry.

**5.1 Theoretical distinction between Action Learning and Action Research**

Clarifying differences between Action Learning and Action Research was an important step for the PPPLT. Partly because this matter could not be satisfactorily resolved from AL/AR literature (see Chapter 2), the PPPLT
embarked on a PPP-contingent formulation of relative differences between Action Learning and Action Research.

It took the PPPLT over a year to recognise that its use of the terms Action Learning and Action Research was problematic. Dialogue about these processes was ambiguous and disrupted effective delivery of PPP to NSW dairy farmers. Given that AL/AR was central to PPP methodology and method, this was a major concern. How could AL/AR be advocated (by the PPPLT) to others (farmers) with little or no experience of such concepts, when those attempting to deliver the process had no common understanding of what the process actually was? Initially this issue was a personal, and not voiced, concern to me as an observer of PPP, but within twelve months the issue had become explicit to the PPPLT as a whole.

Having arrived at PPP immediately from an economic research background I made mental comparisons of the way in which discipline-terminology, or jargon, was being applied in AL/AR against that of economics. In reality there was no comparison because it seemed obvious that all competent economists are familiar with, and consistently apply, at once standardised and specific, terms such as inflation, terms of trade, monetary or fiscal policy, floating currency exchange etc. Even more general terms such as Keynesian or Neo-classical economics evoke a clear understanding of a set of assumptions and complex combinations of economic principles and policy.

I hypothesised about the uniformity of response from asking a sample of economists to define inflation. Each person would probably give a similar answer, employing key language to indicate a phenomenon of the same meaning. I also imagined a scenario in which the sample of economists responded with a diverse, conflicting or jumbled meaning of inflation, but quickly came to the conclusion that if any economist were unsure about a definition from their discipline, an accurate and definitive version could be found in a dictionary of economics or any number of text books on the subject.
By comparison, I could not imagine any two responses from a sample of competent AL/AR practitioners providing uniform language, or more importantly, indicating conceptualisation of a phenomenon in AL/AR such as defining the basic term Action Learning relative to Action Research. Worse was that there was no coherent body of literature that could be drawn upon to clarify the matter, as was the hypothetical case with economics.

The following passages are provided by Bob Dick (2004, http://www.scu.edu.au/schools/gcm/ar/arp/actlearn.html#a_al_al), who is a recognised authority and AL/AR proponent in Australia. Despite his status, Dick’s definitions of Action Learning and Action Research are nothing short of confusing to both new and experienced AL/AR practitioners alike.

**Action learning**

Action learning can be defined as a process in which a group of people come together more or less regularly to help each other to learn from their experience. As Reg Revans used and described it, it was mostly used across different organisations. That is, the participants typically came from different situations, where each of them was involved in different activities and faced individual problems. Most commonly the participants have been managers, though this is not essential. The current practice more often now is to set up an action learning program within one organisation. It is not unusual for a team to consist of people with a common task or problem. There may or may not be a facilitator for the learning groups which are formed. Revans mostly avoided them. Current practice, I think, is mostly to use them.

**Action research**

Action research is a process by which change and understanding can be pursued at the one time. It is usually described as cyclic, with action and critical reflection taking place in turn. The reflection is used to review the previous action and plan the next one. It is commonly done by a group of people, though sometimes individuals use it to improve their practice. It has been used often in the field of education for this purpose. It is not unusual for there to be someone from outside the team who acts as a facilitator.

**A comparison**

I used to think that action research was the umbrella term, and action learning was an application of it. Some of my colleagues, I found, argue that action learning is the umbrella term. On reflection, I don't think it's worth debating. As they were previously practised, I think a useful distinction could be made. In action learning, each participant drew different learning from different experience. In action research a team of people drew collective learning from a collective experience. More recently, the advent of in-company action learning programs has begun to change this. The use of a team with a common project or problem leads to an action learning program which looks remarkably like action research. There were also some differences, on average, in field of application. Action learning was more often used in organisational settings. Action research is more common in community and educational settings. This distinction, too, is beginning to blur. I now wonder if the distinction is worth preserving.
The existence of Dick’s above definitions are accepted by some as the basis of a conceptualisation of Action Learning versus that of Action Research. Although it may not be the dominant comparative definition used by practitioners, it is this diversity and ambiguity that is itself the problem. By way of example and as a consequence of employing Dick’s ambiguous terms, a definitional dilemma is evident in the related work of Higgins et al. (2004, p297, p299, p304, p306, p307), published in the reputable *Australian Journal of Agricultural Research*, where the following terms are used interchangeably in reference to a singular conceptualisation of what they originally refer to as *Action Research*:

- action learning methodologies,
- participatory research,
- agricultural participatory research,
- action learning,
- action research, and participatory action research.

Following personal electronic communication (Diarised Journal), Higgins suggested that Dicks’ above definitions were the basis of the AL/AR work presented in Higgins et al. 2004. What is most remarkable about the inconsistent use of such terms is not just the fact that definitional properties of each term are not differentiated, but that this state of confusion and blurred meaning of terms is accepted and published by peer review processes and is common across AL/AR literature. It would seem an unfortunate, but perhaps indicative, blight on the AL/AR community that its most basic conceptual terminology is unclear but that it remains accepted by the wider research community (such as the editorial board of the *Australian Journal of Agricultural Research*). This suggests that confused AL/AR terminology is considered normal within the AL/AR community, both by the members of that community and those outside it.

The discipline’s own professional journal is itself undemanding of distinctions between Action Learning and Action Research. For example in the *Action Learning and Action Research Journal*, Fisher (2003, p3) claims that her enactment of emancipatory action research *led to insights that may contribute to a more effective activist response in a postmodern world*. In this context is the
reader to assume that *insight* pertains to learning outcomes, research outcomes or both? Given the classroom context of the work presented, Fisher is most probably referring to learning as opposed to research, based on a common understanding of the terms.

In the same vein, I have observed dialogue beyond the PPPLT but within the AL/AR community that is similarly inconsistent or internally contradictory. My participation in workshops, conferences, and meetings with other AL/AR practitioners including direct dialogue with respected professionals such as Stephen Kemmis has highlighted the need for a common or standardised language and corresponding theoretical framework within the AL/AR community (Diarised Journal 1999).

In practice, this issue is critical to all participants of AL/AR processes for establishing and maintaining accurate inter-group communications and developing group knowledge that is reliably understood by all involved. It is also a major determinant in attracting (and deterring) prospective AL/AR participants. From PPP experience, potential AL/AR participants, ranging from project managers to farmers to scientists, were easily confused by the inter-changeability of AL and AR terminology, and hence greater clarity is likely to have increased people’s confidence in joining the process. In some cases, often involving tertiary trained scientists, the intermingling of the words *research* with that of *learning* was off-putting, and at times considered offensive and undoubtedly caused reservations about joining an AL/AR process. In essence the need for clear and accurate AL/AR terminology is twofold:

- to improve the clarity and hence effectiveness of dialogue within AL/AR processes, and
- to present an unambiguous methodology to the those not familiar with AL/AR in theory or practice.

Far from allowing the terms Action Learning and Action Research to collapse
totally into one another, I disagree with Dick’s above definitions both in content and his related sentiment. Based on PPP experience I argue for a strengthening, not weakening, of professional terminology and its use throughout the domain of AL/AR.

**Action Learning does not equal Action Research**

In response to the ambiguity surrounding the meaning of Action Learning and Action Research the PPPLT established its own, new definitions. The PPPLT concurred with Greenwood’s view: *We do not think there is one right way to do [AL/AR], even though we have practices that we prefer personally. [AL/AR] is both context-specific and linked closely to the skills, background, and interests of the practitioner* (Greenwood and Levin 1998, pxii).

On this basis the PPPLT discussed and developed its own intrinsically relevant notion of Action Learning and Action Research. This step was deemed necessary for applying the theory of AL/AR for managing PPP and for Regional Dairy Groups. Although these definitions were founded on specific contextual characteristics of PPP, their formulation is argued to provide a universally applicable conceptualisation of Action Learning and Action Research.

In 2000, Jennings & Packham (2000, p3) wrote the following, which was backed by the PPPLT after extensive internal discussions:

*Action Research begins when the “researcher(s)” join a group of people who are concerned about improving their situation. (Bawden 1990) suggests that it continues as it achieves five outcomes that are placed in the context of, and are subjected to critique from public knowledge; it is this latter point together with the fifth outcome, that in our view separates Action Research from Action Learning (Pedler 1997). The five outcomes are:*

- the situation of concern is improved,
- the understanding (learning) by the practitioners in the situation is improved,
- the practice of the researcher(s) is improved,
- the understanding of the research practice by the practitioner(s) is improved, and
- the research process and outcomes contribute to social knowledge, and the learning outcomes can be shared to other similar situations.

*In this methodology, there is a clear focus on learning (Bawden and Packham 1993) as a way of seeking improvement, through the facilitation of the process leading to decision making by*
During Phase 1 the PPPLT achieved consensus that there is a difference between AL and AR, and that this difference was synonymous with the difference between learning and research. As a result the PPPLT agreed that, in essence, Action Learning occurs when participants become aware of and utilise knowledge, while Action Research occurs when new knowledge is generated by the participatory process, and, this contribution is considered valid by peer review (as indicated by the last dot-point above).

AL involves the development of participants’ knowledge through their exposure to pre-existing knowledge and its re-formulation into local practice, or simply a new understanding. Examples of Action Learning in PPP included increased farmer awareness of soil components through improved soil analysis, and improved farmer understanding of specific fertilisers, pasture species and their value to on-farm management based on literature and practice that was previously available.

For Action Research to occur the results of the process must be audited by peer review for their novelty, credibility, data and research integrity, relevance and applicability beyond the original participants conducting the research. Notably this process of peer review is basically the same as the peer review process that is facilitated by the numerous mainstream research journals and conference forums. In PPP, examples of Action Research included investigations involving Kikuyu grass, insect survey, silage wastage impacts of chicken litter, and the potential use of aquaculture to treat dairy effluent.

**Why distinction matters**

The experience of the PPPLT supported the position that clear distinctions within Action Research terminology are critical. In delivering AL/AR to dairy farmers and industry stakeholders, the PPPLT found separation necessary for its own understanding of the terms. Evidence from PPP suggests that farmers did not
grasp the concept of AL/AR until the PPPLT itself had established its own definitions. This occurred to the extent that AL/AR was poorly recognised by farmers during Phase 1 (Roberts 2001), although the reasons for this had little to do with the character or capacity of farmers.

One aspect within the PPPLT, prior to the establishment of agreed distinctions between Action Learning and AR, was that some members did not have sufficient confidence to present AL/AR to farmers largely, not solely, because of the ambiguity of the terms. Without clear definitions of Action Learning and Action Research there was unease about facilitating public meetings that attempted to impart the virtues of AL/AR to people who had (mostly) never heard of it, but were expected to become personally responsible for enacting the process. Although definitions of Action Learning and Action Research were established in Phase 1, this unease in publicly advocating AL/AR persisted to the end of Phase 1.

**Facilitator confidence and Action Learning versus Action Research**

Armed with a clear and concise distinction between Action Learning and Action Research at the start of Phase 2 the coordinator had the personal confidence to overtly describe AL/AR processes and how they differed between Phase 1 and Phase 2, with public meetings usually receiving the message that Phase 1 had been about Action Learning while Phase 2 (the future of PPP) was about Action Research (relative to Action Learning in Phase 1). The Phase 2 coordinator was able to convey this message confident that questions asked by farmers on AL/AR could be answered, knowing that he had the support of the PPPLT in expressing this view, and knowing the distinction between Action Learning and Action Research was real and had implications for practice in PPP.

AL/AR was central to PPP and throughout the project the PPPLT felt it had a mandate of sorts to fully pilot its use in the NSW dairy industry. This became possible with the clarification of the terms Action Learning and Action Research for the fundamental reason that it was impossible to implement any AL/AR
process when the PPPLT (as a group) had not definitively established what the relevant concepts within AL/AR were.

The PPPLT clarification of Action Learning and Action Research was critical to the way AL/AR was perceived and received by participants within all facets of PPP, as well as to outsiders who, for whatever reasons, became aware of the PPP methodology and method. It was critical because early impressions could make or break a farmer’s interest in joining PPP or directing his/her efforts elsewhere.

Embedded in the PPPLT’s definition of Action Learning and Action Research was an opportunity to tap the mainstream or conventional understanding that most people have of the terms learning and research. This aspect of the definition of AL/AR increased the capacity of the PPPLT to more easily deliver the concepts of Action Learning and Action Research to farmers, funding bodies, research partners, and all other interested stakeholders.

**Action Learning versus Action Research for society**
Throughout Phase 2 the coordinator made contacts with researchers (mostly technical scientists) employed by a range of organisations, including the CSIRO, many universities, other research institutions and consultants, and state government research bodies including NSW Agriculture. In most cases the coordinator was aiming to initiate a collaborative working relationship between the research institution and one of the Regional Dairy Groups. In order to do so, the coordinator was understandably expected to describe PPP to the researcher.

Based on the image presented the researcher decided whether or not he/she was even interested in the specific issue at hand. In Phase 1 the level of contact with research institutions was low (apart from those within the PPPLT), but the issue of AL/AR definitional ambiguity was a factor that limited greater external contact in Phase 1. Conversely in Phase 2, after the ambiguity had been eliminated, the definitional clarity of AL/AR was a factor that no longer limited PPP in approaching external agents, and in most cases provided newcomers to PPP with
an easily accessible entry point to their understanding of participatory learning and research processes.

The clarification (of the meaning of Action Learning and AR) made it clear to any researcher what he or she (and their organisation) were likely to be involved with if they agreed to participate, which was important in determining their availability. In some cases scientists wanted to be involved in strictly scientific research, while other circumstances suggested that researchers were interested in facilitating farmer learning, but if they had no indication from the PPPLT as to what their role was then their willingness to participate evaporated.

**Engaging AL/AR with society**

In several respects the value of the Action Learning and Action Research distinction is recognised as vital. People who worked as pure scientists or technical research officers were consistently sceptical (for example, professionals from universities, government departments, public and private research organisations, etc) that PPP farmers were doing research and they were frustrated and extremely critical when the terms Action Learning and Action Research were used interchangeably to describe PPP activities of the exact same nature, as did occur in the first half of Phase 1 (Diarised Journal).

I found this criticism reasonable on the basis that common usage definitions of learning and research are different, with strong implications of professional identity and the type of outcome each activity leads to. Traditional scientists rightly defend their status as researchers, as do teachers as facilitators of learning, but within PPP the mixing of AL/AR terminology unintentionally caused scientists, and many people who simply subscribed to the value of science, to believe that PPP was co-opting the term research, because the majority of its activities led to learning outcomes. That is, PPP ran the risk of being perceived as claiming that farmer learning experiences were equivalent to scientific research processes and results.
This argument has been stated in literature critical of AL/AR, in which Frideres (1992) attacked the participatory research movement on several fronts. Frideres refers to participatory research as it emerged by application in developing nations, but his arguments are transferable to AL/AR as it was applied by the PPPLT within a developed nation. The ambiguity of terms within participatory research is evidently scorned by some external to the AL/AR community, although their criticism resonates with the PPPLT’s dilemma over the meaning of Action Learning versus that of Action Research. Frideres (1992) makes the following criticism, with reference to Latapi (1998):

Latapi (1998) points out, participatory research advocates reveal a great deal of confusion as to whether or not their actions are to develop new knowledge, educate the people or create action. ... Advocates of participatory research are also vague in their definition of what ‘participatory research’ is! ... ‘[T]hey give the impression of accepting any type of knowledge as scientific’ or as factual based knowledge (in Frideres 1992, p7).

I acknowledge Frideres (and Latapi’s) complaint as valid, as did the PPPLT to the extent that it realised the need to be specific about the meaning of the terms Action Learning and AR. This problem of perception about participatory research does not equate to an absolute condemnation of participatory research, as long as its proponents are consistent and honest about what form of activity they are engaging with, be it learning or research by nature.

Frideres (1992, p10) agrees with the overarching aim of most AL/AR projects to increase the participation of local people within institutionalised improvement programs that aim to operate more inclusive and democratic frameworks, on the condition that the conventional concept of research is preserved and distinguished from alternative formulations:

If the participatory research advocates are referring to development strategies which require agents to listen to local people, then the activity is appropriate. But to confuse it with research is inappropriate and confusing. As such, the term [participatory research] is a misnomer and should not be used.

Although this objection to loose usage of the term research is valuable, not
everything Frideres argues regarding participatory research is borne out by PPP experience, and nor is it acceptable as valid criticism of participatory research. Even so it is useful to examine Frideres’ criticisms in more detail and in light of the PPP experience.

**AL/AR for multiple research paradigms**

In stating that increased participation by local people within research processes is *not antithetical to the traditional positivist position*, Frideres (1992, p6) goes on to say that …

> over time, community activists have come to argue that respondents [ie local people] must participate in the research process at all stages and must be given final authority to cancel, change or restrict data collection, analysis and problem identification. This position meant that community residents had to develop the theoretical perspective by which the results would be interpreted. They would develop the data collection instrument, identify the concepts and carry out the process of operationalization. Sampling procedures and a multitude of other technical aspects of the research would also be carried out by community residents. The ability of lay persons to carry out these activities has gone unaddressed by the proponents of participatory research.

Firstly, Frideres appears to advocate research as a singularly Positivist approach, which is contrary to the approach applied within PPP. Rather the PPPLT embraced a constructivist philosophy that recognised the reality of individual farmers and all stakeholders involved in PPP. An interesting point is that, while farmers valued the capacity of the PPPLT to listen to them and support their agenda for learning and research ambitions using a constructivist approach, many farmer-run activities within PPP relied on technologies, processes and protocols that pertain to the traditional Positivist paradigm. For example, farmers wanting to know more about their soil composition depended on scientific laboratory test procedures to find out what was in their soils. Farmers engaged in silage wastage research required similar lab testing of silage samples to know what nutrient content was being wasted in discarded silage.

PPP activities that did not depend on, or pertain to, the Positivist tradition were primarily the social process initiated or enhanced by the PPPLT. For example, a focus group started in one Regional Dairy Group relied on the assumption that
each group member experienced their own reality that constituted a valid
collection to the focus group’s collective reality. The PPPLT operated on the
same basis, although it is again important to note that in both cases a large degree
of the content of PPP activities relied upon pure science, practiced within a
traditional Positivist paradigm. Notably, the Constructivist approach allows for
the inclusion of Positivist elements, while the reverse is not generally accepted
(within the Positivist paradigm).

The product of this mix with PPP, of Positivist processes being employed within
an overarching constructivist framework, provides a balance that proved effective
for delivering AL/AR to the NSW dairy industry, although explaining the
operational detail (of PPPLT) and rebutting criticisms such as Frideres bears
further discussion.

**Laity as professionals in AL/AR**
Frideres’ complaint about *local* people being allowed or expected to take
responsibility for conducting all facets of scientific research may have been
relevant for part of Phase 1 of PPP, although given the definitional uncertainty
that prevailed it is not easy to really say what was expected of farmers at that
time.

However, during Phase 2 there is no doubt, whatsoever, that local farmers were
never considered to be in a position to fully execute scientific research. Although
possible, most PPP farmers were not *bona fide* scientists (as is probably
representative of farmers in general), and as such were never expected to conduct
scientific research alone.

Not surprisingly, farmers themselves were reluctant to take on the role of being
wholly responsible for conducting all facets of their research, not only because
they were unfamiliar with directing learning or research processes, but because
they recognised the value embodied in a technical officer, scientist, pasture
research specialist or other similarly qualified professional. Indeed Phase 1 of PPP
reported that data collection conducted by farmers for a collective research process was identified as unreliable, primarily because its quality was variable and data omissions were common (Jennings 2000b).

PPP (in Phase 2) never intended to turn farmers into professionally trained scientists, but instead aimed to provide a greater role for ordinary farmers to guide and contribute to on-farm oriented learning and research activities. Through their participation in PPP, farmers were given a greater voice within the NSW dairy industry. This in turn led to increased farmer ownership and responsibility for these processes, and with increased practice, improved farmer’s confidence in managing local research projects and implementing change by adopting the products of their personally experienced learning and research activities.

**Linking farmers with scientists in AL/AR**

The PPPLT approach to farmers engaging in research was for farmers to *outsourcing* any and all skills that they themselves felt were lacking in their group and were necessary for discovering the knowledge they wanted. The form of outsourcing was varied, and did not only occur on a financially contracted basis. Evidence of PPP farmers’ capacity to engage relevant expertise and skills, as commonly occurs in ‘institutional’ research, is provided in the PPP Final report (Dairy Australia 2003, p47):

*From observing PPP, various models emerged for conducting farmer-driven research activities, with a key determinant being the extent to which farmers could take time out from the daily operation of their business to engage with learning, research and innovation processes. Having decided their issue PPP farmers implemented their agenda in several ways, including:*

- contracting the work out to a research consultant,
- farmers themselves have carried the bulk of work in a project but in collaboration with technical experts who have provided design and technical guidance as required,
- creating linkages to other industry projects of a relevant technical nature and collaborating with them,
- building formal institutional linkages between Regional Dairy Groups and research/advisory agents that service the local region, and
• individual farmer-run research efforts who were, at a minimum, required to present their results to the wider dairying community and PPP funding had to be approved by the local Regional Dairy Group.

In Phase 2 the PPPLT placed strong emphasis on increasing the intellectual and scientific rigor of Regional Dairy Group activities, which in effect meant putting the skills and confidence gained in Phase 1 to the test and increasingly incorporating members of the mainstream research community into local activities. To a large extent PPP farmers have achieved a major increase in the technical validity of their Phase 2 projects and are in several instances associated with credible research results of a publishable standard. (Dairy Australia 2003)

PPP experience demonstrates that farmers are capable of participating within industry learning and research processes to a larger extent than is traditionally accepted, although this participation requires supportive structures, policies, and strategies for farmer participation, as were developed within PPP.

5.2 Clarifying the method of AL/AR

A range of factors contributed to AL/AR proving difficult to implement with farmers during Phase 1 of PPP. Some of these factors were circumstantial, such as the distraction of deregulation, the departure of a key AL/AR expert from the PPPLT, and the fact that the Phase 1 coordinator was allocated only one-third of his work time to PPP. Nevertheless, there were also the detrimental causal factors (discussed above) that stemmed from the form of AL/AR method that the PPPLT was attempting to implement in Phase 1.

Introducing AL/AR to farmers during Phase 1 was predominantly characterised by a concern amongst the PPPLT to deliver AL/AR as a step-wise process to Regional Dairy Groups. This created uncertainty within the PPPLT because of its prescriptive and relatively narrow definition of AL/AR, founded on the cycle of plan-act-observe-reflect. The PPPLT’s definitional reduction of AL/AR, to primarily being the cycle (method), came at the expense of emphasising as broad principles (methodology), the notions of democratic, reflective and context-specific activity. A prescriptive sequentially ordered position of the role of reflection within the cycle limited the capacity of the PPPLT to emphasise the importance of reflective behaviour at times that were most appropriate, and
contingent upon each group’s path of activity. With such a narrow definition of AL/AR the PPPLT was unable to justify (to itself) the unreasonable proposition that Regional Dairy Groups should be forced into adopting and implementing the Action Research cycle in order to be liberated from their traditionally low levels of direct input to industry learning and research.

The fact that Regional Dairy Groups did not embrace AL/AR explicitly in Phase 1 compounded the issue within the PPPLT, creating a dilemma as to what extent AL/AR participants should be left alone to develop their own healthy group functioning. Of critical concern was a debate as to which element should come first in AL/AR: process or content of group activities.

Based on the experiences of Phase 1, and the subsequent theoretical AL/AR changes embraced by the PPPLT for Phase 2, evidence suggests that a prescriptive and narrow definition of AL/AR, particularly based strictly on the cycle, was not appropriate for the NSW dairy industry. The reasons for this are twofold, with the first related to problems presented by the theoretical and practical properties of the cycle itself, while the second pertains to the contextual characteristics of PPP with the NSW dairy industry.

**AL/AR beyond The Cycle**

Prior to the commencement of PPP (Phase 1) the PPPLT’s understanding of AL/AR was dominated by the concept of the plan-act-observe-reflect cycle. It was anticipated that participant adherence to the cycle would produce individual and group learning benefits of a single, double or even triple loop order, and in doing so result in tangible industry outputs, such as gains in on-farm productivity.

The simplistic beauty of the plan-act-observe-reflect cycle to represent such complex processes as learning and research was no doubt appealing to most in the PPPLT, as it is for AL/AR proponents. The belief that the cycle would be implemented on farms by farmers was equally attractive. As the PPPLT attempted to apply the cycle in Phase 1 cracks started to emerge in the theory. Based on my
own understanding of the cycle of AL/AR I formulated the following reasons as to why the cycle cannot possibly be applied as the main tenet of any AL/AR project, unless heavily qualified and overtly defined.

In terms of its operation the AL/AR cycle is depicted as a discrete and circular process, and it seemed to me that (perhaps unfortunately) the PPPLT in Phase 1 construed this to mean that each discrete step should be enacted and documented as if they occurred as isolated events in the real world of participant’s individual and collective AL/AR experiences. Evidence for this exists in the Phase 1 discussions about how best to deliver the cycle to farmers, the presentations that were made by the PPPLT to Regional Dairy Groups, as well as in the various attempts to design an AL/AR pro forma that replicated the discrete steps of the AL/AR cycle (Diarised Journal). The PPPLT’s interpretation of AL/AR may seem wrong or unwarranted by other AL/AR practitioners, but there is no clear argument or explanation within relevant literature as to exactly how the AL/AR cycle should be interpreted and implemented in practice.

It remains the responsibility of practitioners to determine what aspects of the cycle are of value and how to comprehend and implement them. For example Fisher (2003) states that cycles of plan/act/observe/reflect were iterated each week within her emancipatory action research method, which highlights the needs for practitioners to construe their own intrinsic formulation of the AL/AR cycle. In PPP the PPPLT adopted an understanding of the cycle that (similarly to Fisher 2003) valued the discreteness of each step in producing learning and research outcomes through documentation of each, and an emphasis on the critical nature of reflection to facilitate learning.

From my observations of the PPPLT’s interpretation of the AL/AR cycle in Phase 1, and my understanding of relevant literature, I believe two key criticisms can be made. Firstly, although the cycle is depicted as a discrete process, it is in reality attempting to describe a continuous process. Second, the cycle is useless for determining the operating level(s) at which an AL/AR activity will be conducted.
Myth of discrete and sequential stages of the AL/AR cycle

During Phase 1 I observed the way in which PPPLT members (myself included) referred to the purpose and applicability of each step in the AL/AR cycle as isolated events. The PPPLT itself attempted to govern its own actions by using the AL/AR cycle, and members talked about ensuring we collectively paused at certain points in the future to reflect on our actions.

Regarding the dairy industry, PPPLT members suggested farmers should document their planning sessions and put those plans into action and document them. This should be followed by a separate event in which (presumably) all those involved reflected on what had happened, before moving onto a fresh cyclical AL/AR spiral, beginning with a deliberate and wholly dedicated session of observation.

Such discussion about PPPLT activities, farmer activities, or even my individual activities within PPP seemed logical based on the way the cycle was understood in Phase 1. Several PPPLT members even suggested this PhD research be structured as an Action Research project, perhaps similar to that of King (2000). The more I became familiar with being an Action Researcher based on the cycle, the more difficult I found it to relate my experiences to discrete and sequential events. I found that conducting any activity revealed the four individual steps of the cycle (amongst many others), but they were presented to me so randomly and seamlessly it was impossible to justifiably separate one part of an activity from another. In addition there was no logical order to the enactment of the steps of AL/AR as they occurred in reality, hence making the sequential order of the cycle problematic, especially to espouse for others (farmers) to use.

The work of Donald Schön provides a useful distinction that is applicable here. Schön (1987, cited in Packham 1995, unpublished) distinguishes between reflection-in-action and reflection-on-action, whereby the former relates to thoughts that stem from direct action regarding whether or not that action has
‘worked’ as intended or expected, and as a result may be perceived as the ‘right’ or ‘wrong’ immediate action. The later term relates to observing and reflecting on our actions to make a description of the tacit knowing implicit in our actions; we can describe the values, strategies and assumptions that make up our theories of action. The AL/AR process applied in Phase 1 of PPP was focused on the value of reflection-on-action, while the difficulties I personally experienced and observed amongst the PPPLT and farmer groups required (I believe) a greater appreciation of the value of reflection-in-action. Within PPP the act of reflecting-on-action provided a more tangible, easily defined and documented method for identifying progress within AL/AR processes, be they within farmer groups, the PPPLT or individual applications.

The innate tangibility of reflecting-on-action was perhaps more alluring for the PPPLT to use as a means for identifying and reporting how AL/AR processes were progressing, but this approach failed to detect the complex and many issues being dealt with on a regular basis that were related to reflection-in-action. This situation is identified by Schön (cited in Packham 1995, p9), when he states: knowing-in-action is dynamic, whereas the facts, procedures rules and theories emerging from reflection-on-action are static. We can usually more easily create change through reflection-on-action, since reflection-in-action leads to habits that smooth the path of our everyday world.

A second difficulty associated with the use of the AL/AR cycle, particularly for beginners, is the fact that the cycle does not reveal or suggest itself to be applicable at any particular project level indeed a reasonable interpretation is that the cycle is universally applicable. PPPLT discussions about what aspects of Regional Dairy Group activities should be validated using AL/AR drew confusion. Should project participants be documenting stages of the AL/AR cycle based on the:

- overall aim of an AL/AR project,
• key objective(s) of an AL/AR project,
• strategic plan of AL/AR project,
• sub-strands of the strategic plan of an AL/AR project,
• clusters of participants that might form and take action within an AL/AR project,
• individual actions that participants take within an AL/AR project, and/or the
• thoughts and emotions of participants within an AL/AR process?

If the AL/AR cycle is considered a universally applicable concept, then, by
definition, the range of scenarios within which it can be applied must be infinite.
This situation is difficult, if not untenable, for practitioners to grapple with,
particularly in funded projects, because no-one wants to leave out any information
that may be of value. In theory the universally applicable AL/AR cycle could be
applied to guide all seven of the above levels of activity and as such all seven
levels could justifiably be documented with respect to the AL/AR cycle. This is
clearly an onerous task given the massive documentation implications.

In PPP the apparent universality of the cycle led PPPLT members to easily
identify and even list elements of Regional Dairy Group actions that should be
included in any AL/AR activity, but they could not confidently state what
elements should not be documented as part of the AL/AR process. With
experience the PPPLT rejected its original literal interpretation of the AL/AR
cycle and tailored its understanding of AL/AR to suit the NSW dairy industry
context. This understanding of AL/AR as applied in Phase 2 is provided below
but in essence the PPPLT accepted that certain core criteria had to be present
within a project to make it eligible as AL/AR, but their sequence was flexible.

5.2.1 Spatial Boundary
The problem of not knowing at which level an AL/AR process should be enacted
led to further thought on the theory of AL/AR. Based on PPP observation I found
that local Regional Dairy Group activities commonly struggled to become actual projects, being run by a functioning individual or group, until the group had intentionally or unintentionally defined the key dimensions of the issue they aimed to explore.

In response to PPP experience Jennings and Packham (2004, p3) developed a framework to address the open-endedness that mostly resulted in confusion when attempting to put AL/AR theory into practice. In Phase 1, when the PPPLT perceived AL/AR as universally applicable it implied the theory was boundless in the range of situations it could be applied to. A major lacking component of AL/AR theory appeared to be some form of boundary theory that could guide practitioners into the most effective uses of AL/AR.

In addition, given that literature on AL/AR was diverse and basically inconsistent in its conceptual presentation of AL/AR, I came to realise that AL/AR theory was limited to basically generalised statements. For example the cycle is a basic representation of a process but there is little if any consistent theory within the literature that extends the theory to a more specific form. This is, to some extent, justified on the basis that most proponents argue that the context of AL/AR practice is always different and a generalised model of AL/AR allows practitioners to formulate their own conception of theory in order to implement their practice.

I find this justification holds true, but does not excuse the lack of contributions toward the development of more refined AL/AR theory. Additional AL/AR theory should be generalisable but also useful for practitioners as a guide for implementing AL/AR, and in this context particularly within the dairy industry or more broadly, agricultural industries.

Jennings and Packham (2004) defined a spatial boundary within any AL/AR process as follows.
A Spatial Boundary primarily refers to the nature and number of stakeholders involved in an Action Research group. The inclusion of any stakeholder brings with him/her many elements that influence [AL/AR] processes, including the organisation(s) a person represents; their geographic origin, current place of residency or concern, cultural identity, gender, political beliefs, ambitions, personal history, nationality, professional skills, social standing within society/community, economic status, networking skills and networks, and their ability to access resources.

Regarding the application of the spatial boundary concept in PPP, Jennings and Packham (2004, p3) provided these insights based on four PPP examples (listed as examples A, B, C, and D).

Example A refers to a single farmer’s investigation of the use of aquaculture within her dairy effluent system. Example B consists of a regional project run by five farmers and several research institutions aimed at investigating on-farm silage wastage over a six-month period. Example C relays the experience of on-farm fertiliser and pasture species trials run by individual farmers over several years. Example D refers to the PPPLT’s management of the project over a five year period.

Identifying spatial boundaries enabled Action Research participants to resolve competing concerns about the level at which an Action Research cycle was implemented. That is, decisions were made about the elements of action that were chosen to be reconciled within the Action Research cycle. In the PPP Example A that occurred on one farm, the Action Research cycle was addressed by an individual with minimal input from an involved research organisation; while in PPP Example B that occurred across five farms, the Action Research cycle was addressed in a collective manner with the research agent incorporated. In PPP Example C, several farmers collaborated within an Action Research framework without a research agent involved, which limited the accountability for learning to only participating farmers. In PPP Example D, the PPPLT’s experiences of operating PPP were primarily reflected upon from a collectivised institutional perspective with few individual reflections being of relevance unless couched within the group discussion.

Throughout PPP the union of Action Research stakeholders was observed to have simultaneously determined the scale and scope of the action to be taken. In Example A, where a single farmer embarked on an Action Research project the physical scale was limited to one farm, while the Example B project was conducted across five farms that represented differing farming systems throughout an entire dairying region.

In both Examples A and B, external institutions with relevant expertise were invited onto projects to provide technical knowledge and analysis. This inclusion of institutional stakeholders increased the scope of the work to be conducted, particularly in terms of building and maintaining new relationships and the increased complexity that comes with specialist knowledge that is framed within the organisation’s cultural and professional work ethic. In Example C, farmers conducted on-farm trials, such as weed control strategies without seeking external advice and the absence of additional stakeholders effectively limited the scope of the work to be done to the local level. For the PPPLT (Example D) the scale of the NSW dairy industry and scope of PPP was similarly determined by the depth of resources and intent of the five stakeholder institutions and their representatives.

The formulation of the concept of a spatial boundary was drawn from specific circumstances to formulate a generalisable theoretical construct; the resulting
advantage of this theory, as perceived in PPP, is described as follows (Jennings and Packham 2004, p4).

Knowing the spatial boundary location of Action Research activity progressed farmer’s implementation of their Action Research processes, seemingly because participants gained a critical degree of clarity about the nature of the task(s) at hand and their scope, even if the finer details were not yet obvious. Based on PPP observation, spatial boundaries were not always established in the early stages of farmer-initiated projects and in these cases the project tended to tread-water until the spatial boundary was recognised and accepted. As a consequence, PPP experience suggests that Action Research processes should actively seek to explicitly identify spatial boundaries in the early stages of a project’s life, and should be made an overt part of the Action Research methodology, in order to reveal sooner to all involved what their Action Research experience was likely to entail and how each participant could contribute.

The spatial boundary concept could be applied in practice equally well by facilitators of AL/AR or by participants. It could be an overt part of the design of an AL/AR project or it could be less formally acknowledged. It could be a documented component of AL/AR or it could be a matter for discussion. In either scenario a spatial boundary will be set by the AL/AR participants in order to do AL/AR, and using this framework is designed to clarify the location, and hence effectiveness, of any AL/AR process.

5.2.2 Temporal Boundary

A Temporal Boundary refers to the time line of an AL/AR project. Addressing the issue of time-tableing is not new within project development, but this approach, when coupled with the spatial boundary concept, can be utilised to guide AL/AR processes to more efficient outcomes. The gains in efficiency observed in PPP are documented in Jennings and Packham (2004, p4), with the key benefit being the clarification of the roles AL/AR participants were expected to play.

Identifying the Temporal Boundary of PPP projects was significant in building group understanding of what people wanted to achieve and how they would best go about it. Many farmer-run projects began with a vaguely defined, usually assumed 2-3 year timeframe for completion, but when this was made explicit and formally discussed in conjunction with the (sometimes still emerging) spatial boundaries, most projects were scaled back and focused upon temporal targets that could be reached or at least monitored on a monthly or six-monthly basis.

Through [group] facilitation and naturally occurring group discussion the recognition of temporal boundaries of an Action Research project led to clear individual and group
understanding of what the project would require of them and for how long. For time-poor
farmers the temporal boundary was a crucial determinant of their involvement because it
elicited assessments of the extent to which new stakeholders could be brought in if desired.
Observations suggested that shorter Action Research projects (from one day up to six months)
had less chance of expanding the spatial boundaries than longer-lived projects (over six
months). From a theoretical perspective this may imply a trade-off exists within Action
Research processes, in which decreased temporal boundaries come at a cost to spatial
boundaries.

5.2.3 Combining Spatial and Temporal Boundaries
Identifying and combining spatial and temporal boundaries is suggested to be a
sound mechanism for locating the level at which any AL/AR project is to be
conducted and thus clarifying the method of AL/AR. Using the same four
eamples (A, B, C, and D), Jennings and Packham presents the following
diagrammatic depiction of the spatial and temporal spectrum (Figure 18).

The examples from each quadrant in Figure 18 are taken from PPP experience
and can demonstrate the value of accurately identifying spatial and temporal
boundaries within AL/AR processes. Example C consists of several farmers being
facilitated to run on-farm pasture trials over two years, with no formal
involvement of other stakeholders (such as agronomists, seed companies etc).
Example A consists of a single farmer working in conjunction with several formal
project partners in an aquaculture trial lasting six months. Comparing these two
eamples on the temporal scale easily identifies that Example A is being run in
one-quarter of the time of Example C.

From the experiences of PPP, a common consequence of groups not identifying
temporal boundaries was that projects were designed that were much more time
consuming than there was time available amongst participants. By formally
identifying the temporal boundaries of an AL/AR process, it is argued that more
precise planning and better participation will result. Identifying the temporal
boundary of a project is critical for engaging participants in a manner that is
appropriate to their ability to commit their time, as well as planning project
activities in an explicit manner so that participants are aware of the expected
timeframe. If participants in Example C (short term project) attempted to govern
their AL/AR process using the longer term timeframe of farmers in Example A, they run the risk of over committing their group’s resource of time. Conversely if the longer term project only secured time commitments based on a six-month limit, it would likely find its time resources severely depleted and unlikely to complete the project.

The spatial boundary is not as easily defined, as most professional projects (as distinct from processes) do expect to identify their working timeframe. The spatial boundary of Example C is vastly different from that of Example A because Example C has many more stakeholders (who are non-farmers). As a result, Example C involves a more complex set of communications, negotiations, expectations, resource contributions and stakeholder participation. Explicit identification of the spatial boundary is important for participant recognition of the nature of the political characteristics of the group, as well as the other key elements such as geographic, religious, skills, expertise, authority, and access to networks.

In combination, the use of spatial and temporal boundaries enable a formal evaluation of any AL/AR process with respect to its spatial and temporal characteristics, which in turn define the roles of individual participants as well as the common purpose of the group. In doing so these boundaries can also be used to clearly identify the scale at which an AL/AR process should be monitored and evaluated. For example, it was appropriate for the PPPLT to pitch its own evaluation processes in the top-right hand quadrant (Figure 18) of long term and multiple stakeholders, while individual RDG projects were less likely to operate at this same scale and so would fit more appropriately into the other three quadrants depending on their intrinsic characteristics.
5.3 Principles of AL/AR for agricultural development

A rigidly formulated conception of AL/AR method could only be effectively applied if it were conceptually accepted and physically enacted by all participants, which in the NSW dairy industry context did not eventuate using a narrow definition of AL/AR. Why this did not happen within the Phase 1 context of PPP can be traced to the way in which the PPPLT delivered the AL/AR method to Regional Dairy Groups, which in itself has implications for the NSW dairy industry and future applications of participatory approaches.

Within the PPPLT’s engagement with farmers, it was my opinion during Phase 1 that farmers were poorly educated and resourced by the PPPLT about what AL/AR was and how it could be used to farmers’ benefit. Although some AL/AR
terms had been mentioned in the first round of focus group meetings, such as Action Learning, Action Research, critical reflection, depictions of the cycle etc, there was little that farmers could take away from these meetings to actually put into practice – despite the fact that PPP funds had started to arrive in their Regional Dairy Group accounts. I believed that (in Phase 1) farmers had, in effect, been encouraged by the PPPLT to go out and build their own regional level social capital using AL/AR but itself failed to provide any insights into how this might happen, or even provide any guidance of a technical or educational nature to facilitate group development and action.

In a reflective PPPLT workshop held at the end of Stage One: Ask, I ranked the PPPLT support to farmers in developing AL/AR as the lowest amongst all participants (Diarised Journal), despite noted differences of opinion from fellow PPPLT members. The lesson gleaned from the fact that Phase 1 failed to harness Regional Dairy Groups within a process of self-motivated and overtly identified Action Learning or Reseaching is perhaps overly simple and true of many aspects in life generally: for participatory processes to be successful the participants must be adequately skilled and resourced. In this context I believed farmers may have taken up the language, ethos and practice of AL/AR if they had engaged in training on the topic. Whether or not this is true remains a moot point that cannot be tested, but PPP results have shown that re-formulating the construction of AL/AR as a method for farmers to adopt can garner positive results.

In Phase 2, the PPPLT dropped the narrow definition of AL/AR (based on the cycle), and a strict requirement that participants must be conscious of the AL/AR process before they embark on any form of action – otherwise they were not doing Action Learning or AR. Instead the PPPLT’s understanding of AL/AR was taken to be a more complex conceptualisation of AL/AR that required all of the following elements to become present within Regional Dairy Group actions at some point, including conscious reflection upon actions and an appreciation by farmers that they were (or had) been conducting Action Learning or AR, as the
case may be. The following defining elements of AL/AR are methodological principles that the PPPLT was required to convert into a practical *method* in Phase 2 (Dairy Australia 2003, p10):

**AR/AL cycle**
The cyclical steps of plan, act, observe, reflect, with the process of reflection being critical.

**Democratic framework**
Ensure a democratic framework within group processes. All stakeholders have equal right and access to express their voice regardless of their knowledge base, professional status, educational status or other means of distinction.

**Context**
Action is taken in the real world to ensure project relevance is high, rather than single issues being extracted from the real world and investigated in isolation from the reality of multiple parameters resulting in research efforts that are abstract and of low relevance to the context being investigated.

**Diversity**
Encouragement of diversity within groups. A wide range of participants is recognised as critical to capitalising on the intellectual power of a group of co-researchers.

**Farmer-driven agenda**
Farmers are the originators and predominant determinants of setting the agenda of issues to be investigated, and farmers are integrally involved and aware of the implementation process for the chosen agenda. Within PPP this has extended to farmers being in control of PPP funds to Regional Dairy Groups. Aspects of Emancipatory AR/AL must be present.

An additional point was made in the Final Report (Dairy Australia 2003, p11):

*In Phase 1 PPP expected that farmers would have to become consciously aware of the Action Research process [as a method] they were embarking upon through PPP activities. The logical extension of this expectation was to require farmers to monitor and evaluate their own AL/AR processes as referred to within the literature and understood by the PPPLT, and there was particular emphasis on Regional Dairy Group documentation of their own plan-act-observe-reflect cycle for each activity conducted.*

*This requirement proved problematic, as described in Phase 1 Milestone Six, and consequently the PPPLT’s position on this changed in Phase 2. Instead of requiring farmers to report their actions in terms of AL/AR jargon, the Phase 2 PPPLT considered it reasonable and transparent for farmers to go through the cyclical steps of AL/AR but without necessarily documenting them as discrete and sequential items.*

During Phase 2 the responsibility for identifying the presence of these elements of AL/AR was split between the PPPLT (mainly the coordinator) and PPP farmers. It was the coordinator’s responsibility to assess each Regional Dairy Group activity on the merits of the Phase 2 conception of AL/AR, but in doing so, with
newly administered forms for farmers to evaluate their own activities, farmers were responsible for supplying the information that made the coordinator’s assessment possible. In practice this combination was effective, particularly at the third farmer conference for which farmers prepared reflective presentations, upon which they reflected again by engaging with peer group questioning and discussion. This aspect of the farmer conferences supports the three levels of learning discussed by Bawden and Packham (1993).

Coupled with this reflective activity, the farmer forum was a prime opportunity to reinforce the elements of AL/AR that each had been engaged in during their local activities. Some farmers related to the concept of AL/AR better than others, with some choosing to adopt the language and publicly state its value to them (Dairy Australia 2003).

Although farmers did become conscious of the AL/AR framework,, the degree to which they identified themselves as qualified or experienced Action Learners or Researchers was not evaluated, nor was it a specific objective of PPP in Phase 2. What mattered to the PPPLT and presumably to the funding providers was that farmers had improved their confidence and farming situation using participatory processes, and they had recognised this as such.

5.4 **Reflective behaviour and industry accountability**

As with most industry-funded projects, requirements of accountability were never far from the collective mind of the PPPLT. In this instance the PPPLT was accountable to DIDCO and DA. At the same time, the PPP aim of increasing the role of farmers in RD&E appeared to rest on the capacity to which the PPPLT could facilitate local level learning and research through critical reflection. An advanced formulation of reflection that simultaneously satisfies industry transparency requirements warrants exploration, in the interests of both AL/AR theory and its applicability, and industry’s propensity to deploy AL/AR processes.
In Phase 2 the PPPLT abandoned its previous approaches for establishing transparent industry records including the expectation of farmer documentation of their AL/AR processes. It did this because both approaches were poorly communicated to farmers, and hence farmers did not respond to them. Detailed reasons why farmers did not respond to AL/AR were addressed in sections 5.2 and 5.3, and this failure to deliver AL/AR included the documentation of farmers’ reflections on PPP activities.

During development of the Phase 2 approach that combined AL/AR with industry transparency, several important realisations were made about the compatibility of these with each other. In particular the similarities between AL/AR reflection and industry outcomes are explored, as well as industry outputs and the tangible products of AL/AR processes.

**AL/AR reflection and the dairy industry**

Within the Phase 2 definition of AL/AR, the matter of reflection was designated to be a conscious activity that farmers had to achieve at some point in their PPP projects. Notably farmers were required to demonstrate reflective behaviour through a range of means. These occurred in the form of written documentation of farmers’ reflections supplied to the PPPLT, individual and group descriptions of reflection to the Phase 2 coordinator, and public presentations at PPP farmer forums, including teleconferences and farmer conferences. In all cases the information reflected by farmers was supplied to the PPPLT and was able to be documented within the PPP Final Report to meet industry accountability requirements.

It should be noted that although some PPP projects were completed and reported by farmers for the PPPLT by the end of Phase 2 (30 June, 2003), the majority of PPP projects remained in progress. Consequently, this research cannot draw on the full range of completed PPP projects to assess the relationship between AL/AR and industry transparency, but sufficient evidence exists from the
transformation of the PPP approach in this matter from Phase 1 to Phase 2 to conduct a credible analysis. The thought behind the transformation of approaches from Phase 1 to Phase 2 was the critical period from which this exposition is drawn.

**Dairy industry terminology of accountability**

Dairy Australia uses the terms *outputs* and *outcomes* as two distinct categories by which industry development may be measured. The former refers to tangible products of a project, such as the final report, or a technical report describing the impact or findings of a particular project, usually in relation to the original aims of the project. Although not strictly true in all cases, there is a sense that outputs refer to results that are expressible using quantitative measurement techniques, such as the number of farmers to adopt an innovation, show up at a field day, or the establishment of new, scientifically proven knowledge.

The latter refers to almost everything else that occurs within a project including the social dynamics and project products of interest, but that do not necessarily fit within the original project goals, or could even contradict them. There is a converse implication that outcomes refer to results that are best depicted in qualitative terms, such as describing the development of social capital, perhaps in the form of an unanticipated but successful focus farm, or farmers’ satisfaction with an aspect of a project that was not one of its original or primary objectives.

**Reporting products of the same kind**

In essence, industry outcomes can be reasonably equated to the reflective criteria established under Phase 2 of PPP. Both are interested in capturing project experiences that are of value to the participants. In AL/AR the goals of a project are accepted as changeable once the process is underway. Uncertainty is acknowledged as a project-changing force that cannot be predicted, or *factored in*, to negate changes to the original goal, or project objectives, plans, methods etc.

Within AL/AR, the experiential path of participants produces a valuable plank of
information upon which reflections can be made to the benefit of individuals and the collective, although they may not all be congruent with each other. The richness and diversity of experience within an AL/AR project is similarly valuable to industry because it enables projects to report what value was created above and beyond what was expected when the project was funded.

Consequently, there is a strong argument for the application of the Phase 2 formulation of reflective practice to be amalgamated with industry requirements for reporting industry outcomes. This commonality should amount to AL/AR being recognised as an increasingly tenable method for future industry projects, particularly within the NSW and Australian dairy sectors. Within PPP the industry terms of monitoring and evaluation were adopted to effect reflection in PPP activities, but importantly the M&E formulation was constructed on the basis of an AL/AR method and was couched within the AL/AR environment of PPP.

An important point is that farmers, like most sane people, have an aversion to paperwork. In my experience farmers of PPP, relative to professional project managers and industry officers, generally tend to be unfamiliar and lowly skilled in writing project applications, associated reports and documenting human behaviour, which perhaps reflects the reality that farmers are more commonly the subject of evaluation rather than perpetrator. In every Regional Dairy Group within PPP it was evident that local stakeholders other than farmers were usually laden with the task of writing up funding applications, monitoring and evaluation, and reporting results. If this perception is valid it would seem plausible that further research should investigate opportunities for better tailoring conventional methods of accountability, particularly in participatory research but with relevance to any work involving farmers, to meeting the requirements of farmer participants. Within PPP farmers were encouraged to personally come to terms with meeting the requirements of winning PPP project applications and fulfilling accountability obligations which essentially mirrored standard industry protocols. Nevertheless, the challenge remains to establish industry processes of accountability, and associated methods that compliment the characteristics of the
farming community.

**Using AL/AR to better capture industry outputs and outcomes**

Reports of industry outputs and the tangible products of AL/AR processes are essentially the same. Both aim to state plainly what happened in a project, usually how much it cost, and what was its immediate impact expressed as a simple cause-effect relationship. As a result it is plausible for these two approaches to be merged, with the industry requirement of monitoring and evaluation being equated to the element of observation within the AL/AR framework.

The outcomes of industry-funded projects are less readily defined and captured than outputs. In addressing the challenge to tailor the reporting requirements for industry outcomes to compliment farmers’ characteristics, it is reasonable to suggest that documentation of reflection that occurs within AL/AR process would satisfy industry outcome requirements.

The manner in which reflection is performed and documented within AL/AR is not a standardised procedure, and although this ambiguity may at first appear unattractive to industry for incorporating into its repertoire of accountability methods, this flexibility may also be advantageous. Reflection activity by farmers within PPP was captured in a variety of ways and then converted into written form for documentation. These ways revolved primarily around communication in the following written and oral forms:

- written documentation of farmer’s reflections supplied to the PPPLT
- farmer’s individual and group verbal reflections made in dialogue to the Phase 2 coordinator
- farmer presentations and audience dialogue at PPP farmer conferences
- farmer reports, and resulting discussion, from PPP teleconferences
- face-to-face dialogue between individual PPPLT members and farmers
- face-to-face dialogue between individual PPPLT members and a group of farmers
• face-to-face dialogue between several PPPLT members and a group of farmers
• one-to-one telephone contact between individual PPPLT members and farmers
• one-to-one telephone contact between individual PPPLT members and a group of farmers
• one-to-one telephone contact between several PPPLT members and a group of farmers
• face-to-face farmer to farmer dialogue in presence of PPPLT.

Given this range of communication types with farmers to elicit reflection, the role of facilitation cannot be underestimated. In PPP Phase 2 there was a conscious effort made to better facilitate dialogue with and amongst farmers that served two purposes: first, to help farmers’ identify their project issues and progress them, and second, to better generate reporting information for transparency and evaluation purposes by the PPPLT. This facilitation took the form of greater PPPLT involvement in RDG activities, and the provision of meeting contexts in which farmers were comfortable developing their PPP activities.

In Phase 2 there was a greater awareness amongst the PPPLT of the need to identify local project coordinators, or drivers, regardless of whether they were formally or informally attached to the local farmer group. These people, once established in their role, became key points of contact for monitoring RDG progress across NSW but also facilitated the PPPLT’s suggestion of reflective behaviour, usually through encouraging farmers to critically question their own activities and outcomes. Documentation of these information and discussion points became valuable data for both local and state level reporting.

A key learning from PPP experience was that the right context and atmosphere had to be created before farmers could be expected to engage in valuable reflective dialogue. In essence they had to be allowed to feel confident enough, and indeed interested enough, to offer their personal views in an environment that
was not threatening but rather encouraging and free of expectations placed on the group, particularly by non-farmers. For example, if PPP farmers were told they had to tell the PPPLT where they had spent their money, farmers quickly felt an element of authority that inhibited their project thinking. Alternatively, if farmers were engaged on a basis of the PPPLT helping them to help themselves — by supporting their learning and research activities — with discussion turned over and opened up to farmers, they felt less imposition of an expectation to adhere to authority and rules and instead perceived PPP as an opportunity to progress their farm management by voicing the thoughts and experiences they had as farmers applying a myriad of technologies on a daily basis.

The value of the creating the right context in which farmers could reflect on their activities became a special focus with PPP. These farmer forums were considered a key learning experience from PPP that is applicable to future industry R, D and E. To better appreciate the nature of farmer forums, the following section discusses the experiences and mechanisms that PPP used to deliver ownership and responsibility to farmers for their own learning and research interests.

5.5 Farmer Forums
This section builds upon PPP experiences that were detailed in Chapter 4 (section 4.4.3). During the course of PPP, farmer-oriented forums of various kinds were established within and between Regional Dairy Groups. These forums provided farmers with a unique industry space in which farmers could express their own concerns, interests and motivations. These forums were unique to the extent that PPP itself was unique in promoting farmers’ role in agenda determination and ensuring they were central, and not end-users, to learning, research and industry development activity.

5.5.1 Farmer conference forums
One characteristic of the NSW (and probably Australian) dairy industry is the lack
of wholly farmer-oriented conferences exist. Whilst technology oriented conference forums, such as the Australian Agronomy Conference, do appeal to farmers, they are far from being the sole target audience. Rather they are largely aimed at professional research scientists and agronomists, to subject research to peer review and information delivery.

Industry conferences such as the Australian Dairy Conference are pitched at farmers, but have minimal farmer presenters. Such industry conferences generally present non-farmer experts who deliver one-way information transfer to the sectors that directly service farmers (agronomists, extensionists) and, to a lesser extent, farmers. A relatively minor capacity exists for two-way exchanges between audience and presenter, but this is restricted to the times allocated for questions and is seldom a thorough and satisfying exchange.

In NSW the only regular (annual) farmer-oriented conference forum is the Dairy Research Foundation Symposium (hosted by the University of Sydney), in which a minority of sessions are generally allocated for farmer presenters with the remainder led by the domestic and international research community. Although a farmer audience is encouraged, amongst other dairy industry stakeholders, the format relies mostly upon information transfer from technical experts to themselves, other industry stakeholders and those farmers who have the time and resources to attend. The Dairy Research Foundation does attempt to reach more farmers by holding a travelling road show of the key presenters to regional dairy areas, although this simply repeats the top-down information transfer process from the off-farm domain to farmers, as occurs at the conference proper.

**Atmosphere of the Farmer Conference**

The PPP Farmer Conferences were unique in NSW because of their wholly farmer-oriented approach. They literally provided farmers with a voice (in the form of a microphone and lectern) within industry, a facilitated process through which farmers could receive and exchange information, and the physical and metaphoric space within the industry’s calendar of events and conventional
processes to liaise with each other in a professional capacity.

Although networking farmers with each other was the prime ambition, farmers were also able to access a select and limited proportion of non-farmer professionals. This limit was found to be necessary for creating and maintaining an atmosphere in which farmers were, and perceived themselves to be, in the majority, in control of the conference agenda, and in all respects, at the very heart of the purpose of the conference.

**Dual purpose of Farmer Conferences**

Having established a wholly farmer-oriented conference forum, the PPP approach aimed to create farmer-to-farmer communication networks, both ephemeral and longer lasting, to more widely circulate and better develop farmer’s ideas, management practices, and experiences of on-farm change. By representing almost all dairy regions in NSW a wide representation of different geographic regions, management practices, family farm structures, industry issues, climate patterns, and farming systems, were brought to a single forum, and importantly, these variables arrived as first hand, personal knowledge and experience of the farmers in attendance.

This latter characteristic, of farmers being the main source of various types of information, led the PPP Farmer Conferences to reveal a second major forum purpose of promoting social networks within industry. Bringing farmers together enabled farmers to experience what they knew in theory must be true: each farmer experienced the reality that they and their family were not alone as milk producers, but in fact were part of not only their local social network, but also regional, state and national networks of farmers in similar circumstances. Without an industry-supported forum, such as provided by PPP, farmers seldom have opportunity to mix with their industry at large primarily because of the time consuming nature of their on-farm responsibilities.

By providing a farmer-oriented forum a social safety net is established because
farmer’s experience a stronger sense of belonging to their community at all levels of industry. This is inextricably associated with farmers being at the centre of attention as presenters and feeling their words are of value to the audience, as well as each attending farmer unavoidably being made aware that he/she belongs to the community of farmers, and that their contribution, understanding and experiences are similarly valued by the presenters and other farmers in order to improve ideas, innovation and their industry.

Outcomes of Farmer Conferences
Farmer conference forums in PPP increased the awareness of participating farmers about other farmers’ experiences. In doing so all participants were required to both receive and contribute to forum dialogue. This aspect was reported by farmers to have elevated the value they placed on knowing others’ opinion and gaining insights into others’ perspective, or in other words valuing diversity as being central to AL/AR. Importantly, farmers identified that the process of learning from others was as significant as the content they learnt. As is documented in the qualitative evaluations, PPP Farmer Conferences reported instances of farmers increasing their value of learning how to learn, or double loop learning. It is logical to suggest that this increase in farmers’ value of the learning process is a form of increasing farmers’ capacity to learn.

Furthermore, the learning process was key to PPP activities and this was demonstrated by verbal communication throughout Phase 2, not only at the Farmer Conferences, but throughout all farmer-run activities across the seven Regional Dairy Groups. As a result when PPP farmers came together at the third PPP conference, the presentation of farmer-run projects of different content but similar process (AL/AR) amounted to the collectivisation of an approach to learning: in essence, a community of practice was established by PPP, but was only wholly observable at the Farmer Forum. The community of practice concept deserves further description as its relevance to PPP is high.

Wenger (1998) characterises a community of practice in the following way:
Members of a community are informally bound by what they do together – from engaging in lunchtime discussions to solving difficult problems – and by what they have learned through their mutual engagement in these activities. A community of practice is thus different from a community of interest or a geographical community, neither of which implies a shared practice. A community of practice defines itself along three dimensions:

- **What it is about** – its joint enterprise as understood and continually renegotiated by its members
- **How it functions** – mutual engagement that bind members together into a social entity
- **What capability it has produced** – the shared repertoire of communal resources (routines, sensibilities, artifacts, vocabulary, styles, etc) that members have developed over time.

In the case of PPP, farmers met the criteria of Wenger’s description of a community of practice although they were also bound as a geographical community as well as by their interest: improving dairy farm management. Wenger (1998, p4) illustrates how communities of practice typically develop over time, which fits with the manner in which farmers came together under PPP. Notably, PPP farmer forums of various types (teleconferences, face-to-face meetings etc) were instrumental in promoting each of the stages of development of farmers’ communities of practice, although the Farmer Conferences captured the final ‘Memorable’ stage in which farmers told their stories.

**Figure 19: Communities of Practice.**

(Wenger 1998)
In addition to relating to these stages of development, PPP farmers behaved in a manner consistent with Wenger’s (1998, p2) view that:

*communities of practice develop around things that matter to people. As a result, their practices reflect the members’ own understanding of what is important. Obviously, outside constraints or directives can influence this understanding, but even then, members develop practices that are their own response to these external influences. Even when a community’s actions conform to an external mandate, it is the community – not the mandate – that produces the practice. In this sense, communities of practice are fundamentally self-organising systems.*

As stated at the end of the previous section (section 5.4), PPP became conscious of getting the context and atmosphere of PPP farmer meetings to be supportive rather than instructive. This meant that the PPPLT was not pushing its mandate for industry results onto farmers in a way that negated farmers’ freedom and independence to determine their own learning agenda. Instead, the PPPLT chose to strengthened its mandate to offer farmers greater opportunity to genuinely own local learning and research activities, which, in terms of Wenger’s above point, enabled farmers to engage with PPP on a relatively ‘mandate-free’ basis. Indeed farmers were actively encouraged to recognise that PPP was a project in which the mandate for action resided with farmers at the local level.

At Farmer Conferences, farmers remarked upon the value of understanding the learning process in the form of AL/AR and demonstrated a shared conception of the nature and requirements of conducting quality learning and research activities, particularly through the process of hearing and seeing each other’s on-farm activities and patterns of project conduct. The capacity of farmers to develop a community of practice approach to their learning and research needs existed at the local and inter-regional levels, but was recognised as such by taking a ‘helicopter’ view that is possible at Farmer Conference forums.

By exposing themselves to a public audience of farmers, the PPP Farmer Conferences increased farmer’s personal skills and capacity for communication. This was true to the extent that farmer presenters voluntarily committed themselves to speak in public, and in doing so were required to contemplate how best to conduct personal effective communication en masse. This not only
involved considering their personal presentation style, but also utilised a range of communication technology largely unfamiliar to farmers, such as microphones, computers, presentation software, overheads etc. In this sense Farmer Conferences have demonstrated their use in increasing farmers’ capacity to communicate in public, as well as within their local PPP activities.

**Taking farmers to the off-farm domain**

The PPP Farmer Conferences were effective in temporarily taking farmers away from their regular environment of the on-farm domain and placing them in the off-farm domain. Several advantages flowed from this experience, not least of which was that attending a farmer forum was a great excuse for farmers to actually leave their time-demanding on-farm schedule. A key reason farmers could justify their departure was that they were leaving the on-farm domain to attend a forum that was directly related to their on-farm activities. As a result, many acknowledged they were still working while they attended the conference but in a different capacity to their usual routine.

Given that dairy farmers harvest their product twice daily, as opposed to say, wool growers who harvest their product annually, those concerned with milking cows are rigidly tied to their properties on a daily basis. As a result, the prospect of an off-farm ‘holiday’ in which the family or part thereof travels in excess of at least 100kms off the farm is not a common lifestyle habit within the dairy industry. The implications of high labour costs to cover farmer absence, and the risk of not being on hand if things go wrong, have contributed to increasing the importance of the farming family having a holiday away from the farm.

Given these constraints on dairy farmers, the PPP Conferences ensured that invited farmers had sufficient time to plan for their off-farm activities (at least 3-6 months). Directly because of these constraints the PPPLT devised a Conference forum that was intellectually rigorous, but with adequate pauses for attendees to appreciate the location and venue of the forum. The PPPLT realised that if farmers left their farm to attend a PPP conference it could well be at the direct
expense of an alternate off-farm expedition, such as a family holiday. As a result it was considered important to hold the third PPP Farmer Conference at a partially holiday-oriented location, in this case by the sea (which for many inland farmers was a novelty in itself).

To accommodate farmers in attending PPP conferences, invitations were sent to farmers with an accompanying explicit invitation for their partners to attend. If partners did attend, they were expected to personally participate in the conference along with all other invitees. This was significant in that other conferences often separate spouses on the poor assumption that other activities would be preferable to conference participation. It also under-recognises the often critical role that farmer’s spouses play in the financial management of the farm, and hence their interest in improving it through conference participation.

Particularly for the dairy farming context, but relevant to all farming sectors, farmer-oriented forums were demonstrated in PPP to hold greater value for the participants if they provided simultaneous opportunities for participants to increase their learning and industry networks within an enjoyable off-farm location. In instances where the location was less enjoyable or not able to be experienced due to time constraints, the entire conference experience for farmers became increasingly like a continuation of their on-farm duties, except cooped up in a conference room. For example, the first Farmer Conference held at Tocal Agricultural College in NSW contained farmers indoors in the same room for the entire working day. It was also held in a rural setting that was not overly unfamiliar to farmers, and hence no great sense of novelty accompanied the venue, other than farmers actually leaving their own farm.

Capturing reflections at Farmer Conferences
The PPP Conference Forums served a key purpose of facilitating farmer reflection on their PPP activities. Reflection was a necessary part of farmer participation because farmers had to reflect on their local activities in order to be able to express them at the conference. In addition the reflection process was formalised
and documented within farmers’ presentations, which were both video recorded and documented in a proceedings document. In addition farmers mostly had prepared notes and material that provided clear evidence of reflection upon actions.

Conferences are effective for facilitating critical reflection processes whereby audience members observe and then question the work being presented. This process was heavily emphasised within the third PPP conference and its potential value to serve as an industry mechanism for evaluating the processes, outputs and outcomes of farmer-participatory projects is worthy of further investigation and application within agriculture.

In approaching any of these media outlets the content of farmer’s presentations is the key determinant of the appropriateness of submitting a story, but its uptake by media could also be enhanced by a high industry profile of the farmer-oriented forum in itself. At present there is no such forum, high or low in profile, in the NSW dairy industry so it would seem reasonable to make a recommendation to further investigate the potential net benefits of farmer conference forums.

**Concluding comment**

This chapter has discussed issues that pertain to the primary tier of research (as presented in Figure 4, Chapter 1), and in particular, matters arising from the PPPLT’s approach to implementing AL/AR. The following chapter addresses issues arising from PPP that relate to the secondary tier of research.
Chapter 6 — Secondary Tier Research: Participation

Theory

The temptation
To take the precious things we have apart
To see how they work
Must be resisted for they never fit together again

Billy Bragg (1988 lyrics, Must I Paint You a Picture)

Introductory comment
This chapter considers issues arising from PPP that pertain to the secondary tier of research (Figure 4, Chapter 1). The following matters of technical learning about participation stem from PPP experiences (Chapter 4) and lead on from the discussion of primary tier research presented in Chapter 5. The content of this chapter relates the farming community’s actions as they occurred in PPP to the theoretical development of participatory approaches in academic research, and their applicability within research, development and extension conducted by agricultural industries.
6.1 Why a theory of participation?

The core component of any participatory method such as AL/AR is, self-evidently, participation. Without *participants* a group does not exist. The extent to which a participatory process succeeds is a function of the level of engagement that participants enact. In the case of AL/AR processes conducted by an individual, the method of AL/AR cannot be utilised if the individual chooses *not* to engage with AL/AR. The possible number of factors that cause an individual, or group of people, to participate in AL/AR process may be infinite. People may deliberately choose to participate or not, for any number of personal reasons, or people may be restricted from joining a participatory process by influences beyond their control and unforeseen circumstances. Furthermore, an existing AL/AR process can be halted by factors beyond the collective participants’ control, potentially leading to the cessation of the process.

A fundamental factor influencing the level of participation that individuals and groups of people contribute to an AL/AR process is the issue of power. Pretty (1995) outlines a typology of degrees of participation ranging from *passive participation* (least personal engagement and control) through to *self-mobilisation* (most personal engagement and control). This scale of participation echoes Arnstein’s (1971) ladder of citizen participation that ranges from *manipulation* to *citizen control*. Together these typologies underline the importance of power relations that permeate any AL/AR or participatory process. The power dynamics within an AL/AR process in part determines the level of each individual’s participation, and hence collective participation levels. Given this relationship, a means for measuring participation can enable an analysis of any participatory process in terms of its power dynamics and the power relations that participants operate under.

Given that non-participation can (and did) heavily influence AL/AR processes (in PPP), even to the point of extinguishing them, it was surprising the issue of participation and non-participation has not been comprehensively addressed in a
theoretical form in AL/AR literature. It was surprising because the literature refers mostly to good news or feel good stories about AL/AR processes, based on intrinsic and context-specific case studies that (I find) are largely meaningless unless one can fully appreciate the context. Literature that reports empirical AL/AR experience is seldom assessed or analysed in pursuit of more detailed, comprehensive or robust theoretical constructions of participation, which could develop and advance AL/AR as a discipline.

It should be noted that the following concepts are expressed in terms of the individual, but are equally relevant to organisations and institutions that participate in AL/AR processes. In the case of an organisation, the properties of its participation within an AL/AR process are treated the same as the position of an individual person, but recognising that the organisation’s position (usually) represents a collective of people and is influenced by the institutional framework, purpose and charter within which they work.

From PPP experience, the issue of participation within an AL/AR process can be viewed from several perspectives. Based on the experiences of non-participation by Regional Dairy Group A in PPP (Chapter 4), Jennings et. al (2000b, p261) suggested that *non-participation is most likely when participation is perceived as threatening, either directly or indirectly. Conversely, perceived potential benefit from group membership is more likely to induce participation. The Regional Dairy Groups that initially embraced the clear incentives offered by PPP demonstrate this.*

**Basic terminology and assumptions of participation theory**
Before embarking on a theoretical understanding of the causes of participation, it is important to establish a standardised definition of the term *participation* that can be conceptualised in terms of *levels of participation*. Participation, within the AL/AR context, can be broadly defined as the commitment an individual makes to the AL/AR process. This commitment may be comprised of a diverse range of elements, but includes quantity of time, quality of personal effort and energy,
application of skills, and critically, a sense of ownership of the content and process combined with responsibility for the outputs and outcomes of the AL/AR process.

It is the last two factors of ownership and responsibility that were observed in PPP as critical components of the well-functioning AL/AR process in which participants experienced satisfaction from the process, and the process itself met the criteria of AL/AR, including situation improvement. This was true for projects that involved larger groups of farmers and relevant stakeholders through to individually driven projects.

Under my own assumption that participation should not be construed as a static, standardised concept because participation varies in terms of the quality and quantity contributed by each participant. Consequently there needs to be a measurable scale defined that differentiates levels of participation within an AL/AR process. To this end I suggest participation be considered on a high-low scale based on each participant’s capacity to commit themselves, to contribute to an AL/AR process.

Before defining the high-low scale of participation, it is important to recognise that participation is governed, and in effect limited by, an individual or organisation’s capacity to commit to an AL/AR process. To establish a valid measure of participation one cannot obtain universally accepted estimates of participant commitment based on relative assessments of participation that occurs within the same AL/AR process. In essence there is a choice to be made about defining participation based on either a within participants or between participants approach, and the former facilitates a universal measure of participation.

Participants in any AL/AR process have different roles to play, and these roles determine the level to which each participant contributes to the process. Consequently, it is not relevant or meaningful to say that one participant’s
contribution was greater than another’s based on their assigned roles and associated tasks. A demonstrative example can be relayed from PPP, as is depicted by Dunn et al (2003a). To reduce silage wastage, a group of PPP farmers each undertook to weigh and record their on-farm fed out silage over a certain period. This act in itself required each of them to commit to varying levels of time and effort, for weighing silage, documentation etc, depending on the type of silage and farming system each had. In the same project a technical officer committed many more hours than any of the farmers (possibly combined), to on-farm visits, silage sample collecting, data recording and collation, report writing, administration, presentation of results etc, while a professional scientist committed possibly the least amount of time but his albeit seemingly small input was critical for interpreting and analysing the data and giving the project a sufficient level of design integrity and credibility.

The key to making the project a success for the participants, and a wider audience, was that each participant fulfilled the role assigned to them by utilising their own ability and resources. That is, the farmers, technical assistant and scientist all displayed relatively high levels of participation by being as committed as they could be, and was necessary, to complete each respective task. Each participant applied a high proportion of their individual capacity to fulfil their specific role.

To further explain the concept, imagine that the technical assistant had poorly committed himself to his multiple tasks, and, for argument’s sake, missed several specified silage sample collection times. This would have severely compromised data integrity and the findings and value of the project. A between-participant comparative measure of participation would have indicated that the technical assistant contributed a higher level of participation than any other member of the project, although in reality the farmers and scientist had performed much better in completing their respective though less demanding tasks. As a result, it is clear that simple aggregation and comparative analysis of each participant’s commitment to an AL/AR process does not reveal the true level of participation contributed by each participant to the process.
The following concepts are linked using the multiplication symbol and equals symbol, and their use here requires qualification. The multiplication symbol is used to approximate the combining of separate concepts or characteristics within an individual or group, such as skills combined with suitability as per Figure 21. Although quantitative symbols are not technically appropriate for linking qualitative concepts, they are employed here with caution as means to glean a rudimentary understanding of how people constitute their participation with particular reference to AL/AR processes.

6.2 Four general principles of Participation Theory

6.2.1 General principle of Commitment Capacity

A further pre-requisite concept needs to be defined. From a theoretical perspective, we need to ask: what constitutes each participant’s capacity to commit to an AL/AR process? First, let us define the term commitment capacity as: a participant’s maximum possible commitment of skills, ability and resources that is required to perform their role and associated tasks within an AL/AR process. Given this definition, we can recognise that the skills, ability and resources of AL/AR members are intrinsic characteristics of each individual participant.

In attempting to understand the concept of commitment capacity, it is equally important to recognise the intrinsic nature of an AL/AR process and the resulting characteristics of the roles and tasks that are assigned for participants to perform (as part of their AL/AR membership). We can assume it is the combining of the roles and tasks presented by an AL/AR process, with the skills, ability and resources of each participant, that determines the commitment capacity of each participant (Figure 20).

Figure 20: Determinants of Participant Commitment Capacity.
A participant with a high level of skills, ability and resources, which are well suited to the AL/AR role and tasks asked of them leads to a high Commitment Capacity. Alternatively, high skills, ability and resources that are poorly matched to the AL/AR roles and tasks leads to a moderate Commitment Capacity, as does a situation in which participant’s skills, ability and resources are low but are well suited to the roles and tasks presented. The final possible outcome is a participant with low skills, ability and resources that are poorly suited to the roles and tasks required in an AL/AR process, resulting in a low Commitment Capacity. These scenarios are depicted in Figure 21.

Figure 21: General principle of Participant Commitment Capacity.

<table>
<thead>
<tr>
<th>Participant Skills, Ability &amp; Resources × Suitability of roles with AL/AR Process = Participant Commitment Capacity (CC)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. High Participant Skills, Ability &amp; Resources × High Suitability with AL/AR Process = High CC</td>
</tr>
<tr>
<td>2. Low Participant Skills, Ability &amp; Resources × High Suitability with AL/AR Process = Medium CC</td>
</tr>
<tr>
<td>3. High Participant Skills, Ability &amp; Resources × Low Suitability with AL/AR Process = Medium CC</td>
</tr>
<tr>
<td>4. Low Participant Skills, Ability &amp; Resources × Low Suitability with AL/AR Process = Low CC</td>
</tr>
</tbody>
</table>

6.2.2 General principle of Participation

With the above assumptions and the concept of commitment capacity in mind, a definition of the level of participation can be formed. A High Level of Participation (High Participation) refers to a high proportional application, by an AL/AR participant, of their total commitment capacity. A Low Level of Participation (Low Participation) refers to a low proportional application, by an AL/AR participant, of their individual commitment capacity. A general principle for participation and resulting scenarios are presented in Figure 22.
In further developing a theory of participation within AL/AR processes, the following theoretical conceptions of Participatory Perception and Participatory Cost are now presented. These concepts rest on the assumption that participation is a function of the intrinsic characteristics of a specific AL/AR process under consideration, the perception of these characteristic by the participant, and, the alternative opportunities available to the participant.

**Figure 22: General principle of Participation.**

<table>
<thead>
<tr>
<th>Commitment Capacity</th>
<th>×</th>
<th>Proportional Application</th>
<th>=</th>
<th>Participation Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. High Commitment Capacity</td>
<td>×</td>
<td>High Proportional Application</td>
<td>=</td>
<td>High Participation</td>
</tr>
<tr>
<td>2. Low Commitment Capacity</td>
<td>×</td>
<td>High Proportional Application</td>
<td>=</td>
<td>Medium Participation</td>
</tr>
<tr>
<td>3. High Commitment Capacity</td>
<td>×</td>
<td>Low Proportional Application</td>
<td>=</td>
<td>Medium Participation</td>
</tr>
<tr>
<td>4. Low Commitment Capacity</td>
<td>×</td>
<td>Low Proportional Application</td>
<td>=</td>
<td>Low Participation</td>
</tr>
</tbody>
</table>

### 6.2.3 General principle of Participatory Perception

Rowan (1973, p84) considers perception to be *one of the main ways in which we come to hold beliefs about the world in which we live.* These beliefs inform our decisions, including the decision to participate. In assessing the likelihood that an individual will join or continue in a particular AL/AR process, a generalised concept of *Participatory Perception* is presented on a high-low scale.

Underpinning this concept is the simple logic that individuals are likely to partake in specific AL/AR processes that are expected to, or actually do generate value to the participant. The level of an individual’s Participatory Perception prior to joining, and throughout an AL/AR process, is a function of the receptiveness of the participant to the intrinsic nature of the specific AL/AR process, such as its aims, content, context, politics, geographic location, membership, social dynamics, etc.

It follows that a person is more likely to join and maintain their participation within an AL/AR group if he/she has a high participatory perception of what their
membership to an AL/AR process may involve and result in. At the other end of the scale, if a person has a low participatory perception about joining an AL/AR process, the person will be less likely to participate. In the midpoint scenario of Medium Participatory Perception, a person is in theory completely free of expectations as to what value an AL/AR process may contain for them, in which case their perception about joining an AL/AR process is neutral, although this would seem an unlikely occurrence in reality. After all, is it possible for a person to be ambivalent about an AL/AR group and still decide to deliberately join or not join the process?

Participatory perceptions inform individuals’ judgements about the value of participating in an AL/AR process. It is founded on a person’s expectations of the future form of an AL/AR process, or in the case where a participant has already joined an AL/AR process, the individual’s perception of the reality of current and past forms of the AL/AR process. Although it is common for AL/AR processes to develop in unforeseen and unpredictable ways, it is important to recognise that participatory perception still exists for participants prior to and throughout an AL/AR process. Even if participants accept they do not know the future composition, direction, outputs and outcomes that an AL/AR process will deliver, they still must form a judgement, based on their perception of participation, about the expected value of initiating or continuing their participation in the particular AL/AR process being considered.

Participatory perceptions refer to both conscious and unconscious judgements that are made by both potential and existing participants of AL/AR. Conscious judgements are mostly recognisable within a participant’s stated reasons for choosing to participate or withdraw from an AL/AR process. Although unconscious judgements are not as readily identifiable or explainable, they clearly play a part in a participant’s choices. For example, a potential AL/AR participant may not be able to explain exactly why he/she will (or won’t) join, but may instead believe that deciding to participate ‘felt like the right (wrong) thing to do’. Furthermore, a person may choose to participate in an AL/AR process against
their initial ‘will’ or ‘instinct’. In this sense participatory perception takes into account that people (and organisations) can behave in ways that may not be strictly rational and utility maximising, which contrasts with neo-classical economic theory.

6.2.4 General principle of Participatory Cost

In attempting to better understand the nature of AL/AR processes and their relationship to potential participants, Jennings et al. (2001) identified *Low-Power Circumstances* and *High-Power Circumstances*, as opposite ends of a spectrum that represents the nature of any AL/AR process. Improved modifications can be made on the original conception of Power Circumstances, by re-casting the concept in terms of the accessibility of an AL/AR process to relevant stakeholder participants. Of particular interest is the issue of why do participants decide to join or not join an AL/AR process?

For this purpose, the concept of opportunity cost has been adapted from the discipline of economics to that of AL/AR by broadening the meaning of opportunity cost beyond strictly financial or monetary terms. Within economics, the concept of opportunity cost exists in any situation where choice is possible, indeed necessary (Knopf 1991, p223), because scarcity means we cannot have everything (Stanton and Launder 1998, p97), which holds true for AL/AR participants in several respects, particularly time commitment.

People must choose to join or not to join an AL/AR process knowing that their time, skills, ability and resources available to be committed are limited. That is, a participant cannot participate in an AL/AR process and an alternative activity during a single period of time; hence choices must be made by potential participants as to whether or not they should join an AL/AR process relative to other potential uses of their time, skills, ability and resources.

Opportunity cost refers to the value of the next most desired alternative to the one selected (Knopf 1991, p223). In economics the concept of opportunity cost
usually refers to decisions to *make or buy, buy or lease, or buy or sell ...* [although] not all opportunity costs involve actual monetary payments (Noble 1995, p179). In economic theory utility maximising agents (consumers, firms etc), under various assumptions, choose the option that has the lowest possible opportunity cost. That is, they opt to embark on the activity that derives the most utility for them, compared to any possible alternative activity. In this case the opportunity cost of the chosen activity is lower than the opportunity cost of the alternative activity.

Within the context of the NSW dairy industry opportunity cost can readily be expressed in financial terms. For instance, a farmer’s opportunity cost of attending an AL/AR process might be the financial value of the milk that could have been produced by working in the dairy; the value of a cow and her calf that died in labour because the farmer was not available to assist the birthing process; or the increased value of pasture that could have been better irrigated before its soil dried and plants withered.

Based on the principles of economic opportunity cost, but with modification of the emphasis of monetary value and utility maximisation, a generalised conception of *Participatory Cost* is defined. The Participatory Cost of an AL/AR process to an individual is equal to the participant’s value of the next most desired alternative use of their time, skills, ability and resources. It follows that the higher the Participatory Cost of an AL/AR process to an individual the less attractive the process will be to potential participants, while the lower the participatory cost of an AL/AR process the more attractive it is.

An AL/AR process that is relatively easy to join has a low opportunity cost for participants. It follows that zero Participatory Cost means that joining such an AL/AR process bears no cost to the participant in terms of participation in other activities and loss of resources. Notably this scenario (of zero participatory cost) was virtually impossible within the context of PPP, particularly because farmer’s time is valuable.
Non-financial nature of Participatory Cost

The value of the cost associated with participation may be financial, but more commonly refers to non-financial costs. For example, the participatory cost for a farmer participating in an AL/AR process may be forgoing the personal social benefits of spending time with family. Or participatory cost could be expressed in political terms by a farmer who missed out on a board membership position with a milk processor because of participation in an AL/AR process, rather than attending a series of milk processor meetings from which board membership would have resulted.

Within the context of economics, the concept of opportunity cost commonly applies to reasonably tangible valuations, such as the price of the next most desired goods forgone. In this example the opportunity is not only expressible in quantitative dollar terms, but the valuation can be made into the future to the extent that prices are available.

Within the context of AL/AR the reverse is more common, that is, the next most preferable alternative to joining a specific AL/AR process is seldom likely to be totally quantifiable, and often not in dollar terms. This is not to say that Participatory Cost does not exist, but rather that an individual’s perception and expectation about specific AL/AR processes play a major part in determining whether or not participation occurs, which is why the concept of participatory perception was necessarily defined.

In a departure from standard economic assumptions, the concept of participatory cost does not rely on a belief that individuals are perfectly rational and hence automatically pursue a path of personal utility maximisation. An individual’s participatory perception of any AL/AR process includes personal valuations of the AL/AR process beyond the immediate interests of the individual participant. For example, a farmer may join an AL/AR process expecting or knowing that his/her personal farm management techniques and profit levels will not improve, but
he/she nevertheless derives value, in the form of personal satisfaction, from seeing and contributing to an AL/AR process that benefits the industry as a whole. Figure 23 illustrates how Participatory Cost might appear to a farmer when considering the option of joining an AL/AR process.

**Figure 23: Manifestations of Participatory Cost.**

The manifestations of Participatory Cost presented in Figure 23 were noted in many PPP projects. In several instances farmers felt they were investigating an interesting issue, enjoying the social support of the AL/AR process, or simply doing good for their industry, despite bearing personal financial and other non-financial costs. In addition, the entire DIDCO board of farmers appeared to operate on a desire to benefit industry, because farmer members are virtual volunteers, relative to the alternative financial benefits they could pursue.
Similarly an organisation may join an AL/AR process if it perceives there is value in participation beyond the organisation’s immediate and tangible gain; for example NSW Agriculture charter is, where appropriate, to assist agricultural industries, and as a result the department participated in PPP on the basis of contributing to farmers’ progress rather than strictly benefiting the department.

6.3 The Participation Decision

The concepts of Participatory Cost and Participatory Perception are relevant throughout the life of an AL/AR process because a participant can, and will, withdraw at any point if they experience a sufficient reduction in their Participatory Perception and/or their Participatory Cost becomes too great.

The theoretical concepts can be used to assess, explain and, where quantitative or qualitative measurement of variables is possible, predict the likelihood of participation in any AL/AR process for relevant stakeholders. A general principle of the participation decision can be expressed as follows, with four scenario outcomes presented (Figure 24).
6.4 Applicability of Participation Theory

This theory of participation can be applied to most if not all aspects of PPP, although to do so would be a laborious task. Of particular interest are the case studies (presented in Chapter 4) outlining the impact of externalities on PPP and situations of non-participation with Regional Dairy Groups.

6.4.1 Externalities and Participation Theory

Externality (1) and the Participation Decision

In assessing the situation in Externality 1 (Chapter 4.4.1), it was found that a key PPPLT member departed PPP. This was despite his major role in the PPP design and funding proposal, funding success, early project operations in the field, his guiding and informing the rigour of the AL/AR within PPP, and developing the PhD research domain. So why did this person leave PPP, particularly at such an early stage when the PPPLT were highly motivated, the project was progressing well with farmers, and overall the project’s challenges had just begun?

The fact that the PPPLT member chose to leave part-way through PPP
demonstrates the validity of the claim that Participation Theory is relevant (to any participant) prior to joining, and throughout the participant’s time with an AL/AR process. During the period in which the decision was made to leave, the person maintained their enthusiasm for PPP in every respect. This person appeared to want to stay and continue the project with the PPPLT, influence the way it unfolded and progress research outcomes. In other words, this person’s Participatory Perception of PPP was undoubtedly high.

The same person’s level of Participatory Cost associated with PPP was high. Alternative career opportunities were presented to this person that could not be fulfilled without severing direct ties with the PPPLT. This situation of the participant being forced to make a choice between options supports the assumption that Participatory Cost refers to instances in which limitations lead to a selection being made at the cost of other possibilities. This person was offered an opportunity that was too good to refuse, and so they left PPP.

A participant with high participatory perception and high participatory cost of an AL/AR process equates to an ambiguous decision to continue participation, in terms of the general principle of the participation decision. In reality the person’s participatory cost far outweighed their high perception of PPP, leading to the choice of non-participation. This example is synonymous with scenario 3D in Figure 24.

**Externalities (2) and (3) and the Participation Decision**

Both deregulation (PPP Externality (2)) and drought (PPP Externality (3)) affected the viability of dairy farm businesses in NSW. Consequently, many dairy farms stopped operating, with some eliminating dairy operations completely, while others looked to diversify their farm with other stock or enterprises.

For those farmers who left the NSW dairy industry altogether it is clear that for them, the Participatory Cost of PPP became too high to justify participation, regardless of what their participatory perception of PPP was. This was a
consequence of the massive increase in the financial opportunity cost of running their dairy business, induced by reduced milk prices and hence receipts (deregulation effect) and soon after, higher input costs (drought effect). Of the farmers who left the industry most retained a reasonably high Participatory Perception of PPP, but that the Participatory Cost was unsustainable in terms of their participation. In these cases, the scenario 4D explains the decision to not participate in PPP.

Interestingly, a farmer leaving the industry did not always leave PPP. In two different Regional Dairy Groups, two particular dairy farmers left the industry as producers, but maintained their participation in PPP activities. In these cases, the evidence suggests that PPP held a high Participatory Perception for each farmer, and that in their new roles of no longer being dairy farmers, their (post industry exit) Participatory Cost had reduced substantially and to the point that participation in PPP was possible. While still operating as dairy farmers these participants experienced scenario 4, but after they stopped farming they experienced scenario 1 (assuming their Participatory Perception remained relatively high) in Figure 24.

6.4.2 Non-participation and Participation Theory

Non-Participation (1) and Participation Theory

In the case of Regional Dairy Group A (section 4.4.4), where the local board rejected the introduction of PPP, we can see that Participatory Perception and Participatory Cost explain this behaviour. In short, Regional Dairy Group A had an extremely low Participatory Perception of PPP, to the extent that they believed PPP would be irrelevant to their needs. The level of Participatory Cost was reasonably low because they could have joined PPP without forgoing major alternative activities, and they presumably would have joined PPP immediately if they thought the project worthwhile. In this situation it was clear that the perception of PPP was more of a problem than participatory cost.
In the Regional Dairy Group A situation we can attribute non-participation to participatory perception, particularly in light of the fact that Regional Dairy Group A did later join PPP, indicating their Participatory Cost was not high (assuming it was relatively constant over the period in which they rejected and then accepted PPP). From Regional Dairy Group A’s statement to the PPPLT the prime reason for non-participation was a perception of PPP being irrelevant — in effect, a waste of time. From the PPPLT’s perspective there was more to it. PPPLT discussion revealed an issue of gate keeping (King 2000) within Regional Dairy Group A, and that key decision makers within Regional Dairy Group A perceived PPP as a threat to their authority in the area, and hence their Participatory Perception of PPP was low.

**Non-participation (2) and Participation Theory**

Regional Dairy Group B represents a more complex case because participants, at least initially, appeared to have a high Participatory Perception of PPP, and a relatively low Participatory Cost, hence making them available to participate in PPP. Despite these conditions the group failed to establish any clear aims or objectives — a situation that prevailed for over 12 months.

Aside from the impacts of deregulation and drought that were particularly severe for the region, a major problem stalling the formation of an AL/AR process was intermittent attendance by participants to PPP meetings. In some instances the problem was extreme, for example one key farmer committed himself to organising a PPP meeting for a particular day. Despite requesting the presence of all the people he had contacted, including the PPPLT, and (even) confirming the event right up to the night before the meeting, he did not attend himself.

This farmer apparently experienced a sharp increase in his Participatory Cost associated with attending the meeting. This increase in Participatory Cost must have been very large because it outweighed not only his high Participatory Perception, but the public embarrassment of not attending the meeting when he was supposed to be a key participant. In reality my diary observations record this
farmer did not attend because of an accident or unexpected circumstance, but rather it was a conscious decision not to go when the time arrived and in large part was most likely influenced by his family and his and their combined expectations to perform on-farm work.

Observations of Regional Dairy Group B suggested that the farmer in question did have a high Participatory Cost associated with attending the meeting — the cost of foregoing his productive labour applied on-farm, which was understandably common across PPP. This particular farmer was more concerned about maintaining social family harmony that was achievable by performing his on-farm duties, which in a social context meant he diligently complied with his family’s request that he stay (and work) on the farm.

In analysing the experiences of this farmer, it is perhaps reasonable to suggest that his true Participatory Perception was not revealed in the early stages of PPP, or that it declined rapidly without any obvious indication of such during the first 12 months of PPP in Regional Dairy Group B. If the farmer truly had a high Participatory Perception of PPP then this may have been able to outweigh the high Participatory Cost imposed by the family member’s request to not go off farm. It would seem a fair interpretation that either the farmer’s original perception of PPP was lower than was indicated by his actions and statements, and/or his level of perception shrank from high to medium to low over the first 12 months of PPP.

6.5 The Three Modes of AL/AR and Participation Theory
Grundy’s (1982) three modes of AL/AR (Chapter 2) provided a valued framework for distinguishing different ways in which AL/AR is implemented and was conducted in PPP. For instance, the PPPLT endeavoured to implement a Emancipatory AL/AR mode of AL/AR from which farmer’s would be the emancipated beneficiary, while the AL/AR that farmers implemented on their farms was usually of a Practical AL/AR nature and/or Technical AL/AR nature. The latter was particularly true for the Action Research projects conducted in PPP
(as distinct from the Action Learning projects). Given this respect for Grundy’s (1982) theory and terminology, and a desire to uphold its usage and application within the discipline of AL/AR (by both the PPPLT and myself), it is interesting to see how well the theory of participation fits with the concepts of Emancipatory AL/AR, Practical AL/AR and Technical AL/AR.

**Emancipatory AL/AR and Participation Theory**

Participants in an Emancipatory AL/AR process have a greater share of ownership and responsibility for the process and its outputs and outcomes than do those in Practical AL/AR and even more so than those in Technical AL/AR processes. Ownership and responsibility in PPP manifested as farmers determining their own learning and research agenda, and how the agenda was implemented. This ownership led PPP farmers to play a greater role in local activities than otherwise might have been the case. In terms of participation theory it would seem that Emancipatory AL/AR participants have higher participation levels because of their higher commitment capacity and a higher proportional application of this capacity.

It is plausible that the commitment capacity of participants in an Emancipatory AL/AR process is higher because the participants are the key determinant of the project agenda, boundaries, methods and implementation. As a result Emancipatory AL/AR participants can personally, and through group dialogue, match their individual and collective skills, ability and resources to the roles and tasks of the Emancipatory AL/AR process.

Emancipatory AL/AR participants are likely to contribute a higher proportional application of their commitment capacity for the simple reason that they were the determinants of their commitment capacity. That is, if the participant decided their own level of commitment capacity, then they would presumably intend to apply this capacity in full. This is particularly true because the participants in Emancipatory AL/AR were the ones who co-determined the suitability of their skills, ability and resources to the roles and tasks. The higher the ownership and
responsibility for an AL/AR process the higher the proportional application of a participant’s commitment capacity.

**Technical and Practical AL/AR and Participation Theory**

From the above application of participation theory to Emancipatory AL/AR, it would seem feasible that the proportional personal application of Practical AL/AR participants would be less than Emancipatory AL/AR participants because they had less direct input into the construction of their commitment capacity and hence less responsibility for fully realising their commitment capacity. Technical AL/AR participants have the lowest commitment capacity because they have no direct input to the determination of their commitment capacity resulting from low suitability of their skills, ability and resources to the roles and tasks, and similarly low responsibility for realising their commitment capacity.

Participatory Perception is higher in Emancipatory AL/AR processes because participants determine and promote their own agenda, and presumably so too their own interests and ambitions. This is less so in Practical AL/AR and virtually non-existent for Technical AL/AR participants. Participatory Cost must also be lower for Emancipatory AL/AR participants because they determine the focus and implementation of the AL/AR process, thus ‘building-in’ the lowest possible opportunity cost of participation. For Practical AL/AR and Technical AL/AR Participatory Cost can plausibly be taken to be increasingly greater for respective participants because they have lower and lower input to designing and implementing the project, and hence greater likelihood of clashes with alternative uses of their participation.

In terms of the four scenarios associated with the Participation Level and the Participation Decision it would appear that Emancipatory AL/AR fits with scenario 1 of both general principles, while Practical AL/AR is a medium situation best represented by scenarios 2 and 3, and Technical AL/AR fits with scenario 4 of both principles.
Concluding comment

This chapter has identified a theoretical framework of participation that pertains to the secondary tier of research (Figure 4, Chapter 1). The following chapter provides research and discussion that relate to the tertiary tier of research.
Chapter 7 — Tertiary Tier Research: The Origin of Extension

Of the diligence and true attendance which a Husbandman should give to his husbandry.\(^3\)
John Fitzherbert (1598, p.i)

Make two blades of grass grow where one grew before\(^4\).
Porter (2000 p308, cited from Arthur Young 1767)

Introductory comment
This chapter discusses matters pertaining to the tertiary tier of research (Figure 4, Chapter1) and involves an historical investigation of the origin of contemporary extension. This form of meta research was useful to the author as a way of learning about the discipline and practice of Extension as an evolving process of learning in itself, which in turn enabled a better understanding of the role of farmers in PPP. Using some key underpinning assumptions related to PPP, Foucault’s method of problematisation is utilised to generate a problem statement that examines the role of farmers within Extension. Foucault’s general history approach is combined with the methods of archaeology and genealogy (outlined in Chapter 3) to guide this research and further demonstrate the intrinsic value of

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\(^3\) The significance of this quote pertains to Chapter 7 and it exemplifies an early agricultural author making printed recommendations to those who work the land. In 16\(^{th}\) century England the letter \(s\) was commonly written as \(f\), and the letter \(v\) as \(w\). Hence the quote should be read ... should give.

\(^4\) Arthur Young used this quote from the King of Brobdingnag as the charter for the first publicly funded Board of
PPP as a farmer-centric project. Archaeology is applied to identify the origin of extension and present an outline of Australia’s consequential extension experience, while genealogy is applied with regard to the role of farmers in RD&E processes in general, and in PPP, specifically.

7.1 Premise for researching the origin of extension

*Problematisation* and underpinning assumptions

Foucault’s concept of *problematisation* was used as the basis for selecting the problem statement for this chapter. This involved the consideration of various probing questions regarding the role of framers in PPP, and RD&E in general. This method was distinctly different from that of first selecting a fixed time period within which to investigate the origin of extension and the role of farmers. In order to inform and shape my research questions, and as part of the *problematisation* approach, some of the key assumptions related to PPP were identified. In addition to the project aims, objectives and outcomes, PPP came into existence, at least in part, based on the following assumptions:

- **Farmers’ experience and cumulative knowledge is critical to the relevance and effectiveness of industry research, development and extension.** This is particularly true because farmers are end-user adopters of innovations generated and extended by industry, and in the dairy industry are fifty per cent contributors to the research funds through a milk levy.

- **Farmers’ knowledge is under-utilised by industry research, development and extension processes.** That is, farmers have low levels of direct control over the agendas set by research, development and extension services – the results of which are mostly aimed to benefit farmers and their industry.

Although these points were not explicit within the stated project aims of PPP, in my view they were critical assumptions that motivated the PPPLT. Evidence of these assumptions is drawn from PPP, such as the initial reluctance of farmers to break away from the entrenched technology transfer process of expecting and receiving *silver-bullet* solutions from the research community through extension

*Agriculture in England.*
agents. In addition, most PPP farmers were taken by surprise and challenged by the (PPP) invitation to name their issues and take ownership and responsibility for solving them. Some similarity of this bottom-up project circumstance is reported by Frossard (2002), where farmers had to overcome an ‘inferiority complex’... always reminding themselves they were among equals..., and Sillitoe (1998) who recognises the problem of local people not knowing what scientific options are available.

Being a complete newcomer to extension (when I first joined PPP), I felt a need to understand why the above assumptions were present and hence why PPP was considered novel because it aimed to genuinely share the project’s agenda, ownership and resources directly with farmers. This apparently unusual project characteristic implied, in general, a distinct lack of farmer input into the processes of industry research, development and extension.

My questioning centred around the status accorded to farmers within extension processes, which I soon recognised as being one component (although major) of a bigger picture I needed to comprehend, that of the nature of extension itself. In order to understand the nature of extension I felt compelled to know its origins and the fundamental components that underpin its existence. As such, my specific problem statement stemmed from a desire to better understand why farmers are relatively absent from contemporary RD&E processes (as recognised in the assumptions underpinning PPP), but in essence was asking: why, how, when, and where did the current forms of extension emerge?

7.2 General History, defining extension and locating its origin
As was discussed in section 3.4.2, this research is aligned with Foucault’s general history approach, as specified by Dean (1994), and not total history. This approach is particularly appropriate because the topic of interest (the origin of extension) has not been clearly defined. Accordingly, my problem statement specifies its own historical terrain to construct an evidence-based narrative of the history of agricultural extension that can justifiably be considered its origin.
With regard to the origin of extension and the role of farmers, Foucault’s *general history* approach suggests conducting an ‘ascending’ analysis of power, starting,... from its infinitesimal mechanisms, which each have their own history, their own trajectory, their own techniques and tactics, and then see how these mechanisms of power have been – and continue to be – invested, colonised, utilised, involuted, transformed, displaced, extended etc., ... (Gordon 1980, p99). The current analysis attempts to focus on the power invested within extension and the fundamental formative conditions that enabled its origin and subsequent development.

Before attempting to locate its origin, a plausible definition of extension must be specified. Although various attempts have been made, for example Williams (1968) and Farquhar (1966) developed early definitions of extension in Australia, there is no neat and finite combination of words that pass as the definition of extension (Russell et al. 1989). Given such ambiguity, this research is left little choice but to specify its own definition of extension, that can be applied in the search for its origin (Figure 25). The below (Figure 25) definition of extension complies with and promotes those of Van den Ban and Hawkins (1996), Swanson and Claar (1984), Mauder (1973), and Maalouf (1988). Notably, the definition presented in Figure 25 (below) is more explicit about the intent of extension to serve a collective interest, such as industry benefit or the public good, which goes beyond the immediate on-farm context.

**Figure 25: Definition of agricultural extension applied in this research.**

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<table>
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<tbody>
<tr>
<td>1.</td>
<td>Farmers are the main agent with and to whom extension is practiced.</td>
</tr>
<tr>
<td>2.</td>
<td>Extension has simultaneous intentions to:</td>
</tr>
<tr>
<td></td>
<td>a. improve individual farm management;</td>
</tr>
<tr>
<td></td>
<td>b. advance a collective rural and non-rural interest beyond the individual farm.</td>
</tr>
<tr>
<td>3.</td>
<td>Extension operates a linkage between the on-farm and off-farm domains of agriculture.</td>
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Within these definitional bounds the intent of agricultural extension to advance a collective interest (2b, Figure 25) is dependent on achieving the first intent, to
improve individual farm management practices.

**Locating farming in history**

In addition to defining extension, this research accepts that human farming systems – which must exist in order for extension to exist – are defined as *the establishment of an artificial ecosystem to yield a staple food supply* (Bronson 1997, p28).

Firm evidence supports the hypothesis that southeast Europe witnessed some of the earliest instances of farming in Early Neolithic times, with farming sites identified in Greece dated ca. 6000 BC, Bulgaria (5000 BC), and the region of the former Yugoslavia (4700 BC). These *Early Neolithic sites ... contain evidence for the earliest local use of pottery, polished stone artefacts, and domesticated crops and animals* (Cowan and Watson 1992, p76 cited from Dennell 1992).

**Locating extension within farming**

Given that farming is accepted to have come into existence since the Early Neolithic period, the task at hand is to attempt to identify the emergence of extension practice that satisfies the current definition of extension (Figure 25).

Although interesting, several possible instances of the earliest practice of extension do not qualify as a form of extension practice that is relatable to contemporary times. These include Egyptian (agricultural advice in hieroglyphics), Greek and Phoenician (agricultural writings), Roman (Latin texts on agriculture, 200BC-400AD) and Chinese (agricultural publications during Han Dynasty, 25-220AD; Sung and Yuan Dynasties, dated 960-1368) (Jones and Garforth 1997, Russell 1966). A major factor in their failure to comply with the current definition of extension (Figure 25) is the lack of a clearly defined off-farm domain in terms of major cities, markets, institutional frameworks, defined industry structures, and the rise of the nation state which emerged much later to a form that can be recognisably linked to today’s extension practice and operating environment.
Jones and Garforth’s (1997, p3) cite that the first known example [of extension] was in Mesopotamia (roughly, present-day Iraq) around 1800 BC ...[where] archaeologists have unearthed clay tablets of the time on which where inscribed advice on watering crops and getting rid of rats – important for mitigating any potential loss of taxation revenue from farmers. This example meets the extension definition (Figure 25) in terms of intent to benefit the public good by securing the tax base revenue of the community, but the technology of stone tablets provides too weak a link to the manner in which contemporary agricultural communication is conducted.

Without an off-farm domain there is doubt that the (above mentioned) extensionists were operating a link between the on- and off-farm domains of agriculture. That is, most community activity was predominately rural by nature with no scientific reasoning, discussion or informed debate available from the off-farm domain. Without a clearly identified off-farm domain it is problematic, indeed impossible, to attribute public benefit beyond the farm gate (so to speak), thus making it unacceptable to consider that these early examples of extension were operating a linkage between the on- and off-farm domains of agriculture (Figure 25).

7.3 Archaeology of the origin and history of extension
The concept of archaeology, as presented in Chapter 3, is applied in this section to discover and construct an historical narrative on the origin and developmental history of extension. In particular I have drawn upon Foucault’s approach (as presented by Kendall and Wickham 1999) of aiming to study the historical archive of agricultural literature with a view to:

- analysing the positions that are established between human beings;
- describe surfaces of emergence identified within the archive, and,
- describe institutions and the authority they assert.
These tenets were used to frame this *archaeological* search of relevant agricultural literature with the findings providing the basis for the next section of applying the Foucauldian method of *genealogy*.

**European origins of extension**

Societal transformation during the European Renaissance was significant, and exerted major influence on the origin and development of extension. In particular, rational inquiry and the decline of feudalism provided necessary conditions for extension to emerge on a scale, in a form, and within a societal context that we can relate to present day extension. Jones and Garforth (1997, p4) agree with this estimation, stating that:

> The direct antecedents of organized agricultural research and dissemination of its results which occurred in nineteenth century Europe and America can be traced back to the 'renaissance' which began in the fourteenth century. ... Between 1300 and 1700, European society became transformed from its medieval feudal forms into recognizable modern social systems. ... Along with the growth of national states and European exploration and 'discovery' of the rest of the world was the 'new learning'. This involved not only a fresh appreciation of rediscovered classical writings and art forms, but also many novel ideas and activities, a spirit of humanism, and rational inquiry.

These historically monumental developments within Europe realised several societal transformations and benefits, including the invention and increasing utilisation of the printing press. Prior to commercially printed editions of their work, authors relied upon laborious, multiple handwritten manuscripts, which were (obviously) limited in their production. In the origination of extension the role of the printing press was critical because it served to create a new intellectual canvas and space for dialogue that I have called the *off-farm domain*.

As acknowledged by Jones and Garforth (1997), the invention of the printing press by Gutenberg (approximately 1450) with its moveable-type technology was a major development in extension history. Its commercialisation and quick dissemination across Europe created the first opportunity for widespread information and knowledge transfer throughout all sections of society, including agriculture. Notably, this increased capacity to communicate stemming from the
Renaissance period is directly traceable to contemporary extension practices.

The rise of the printed word collapsed previously steadfast barriers that can be thought of in terms of Foucault’s archaeological method to identify and describe *surfaces of emergence*. Several boundaries were readily crossed by print media, not only geographically but linguistically, culturally and across religions, as demonstrated by some early examples of agricultural publications. The earliest recognised European agricultural text of the Renaissance was *Liber ruralium comodorum* by Pietro de Crescentius in 1304, originally in Latin but translated into Italian and French, and first published by printing press in the 15th century (Prothero 1912). Another title was translated from German and re-published in England, called *Foure Bookes of Husbandry*, by Heresbach with an extra 16 pages contributed by the translator, Barnabe Googe Esquire in 1577 (Prothero 1912, Jones and Garforth 1997, Fussell 1947).

**Growth in agricultural authorship and publication**

Despite barriers to publishing, including education levels, low stocks of writing skills, and limited resources to publish, the number of successful contributors to the stock of knowledge by the 16th century, in Britain at least, was significant and ever increasing. Not only were the quantities of publications improving dissemination but the quality appeared to be of value to many farmers and their industries.

Across Europe, agricultural literature that focused on the improvement of farming was emerging, with authors such as Tarello and Crescentius in Italy, Heresbach in the Low Countries, Charles Estienne, and Berbard Palissy in France, as well as the production of the Encyclopaedia (1751-70, Prothero 1912). In Tudor England, John Fitzherbert published the first (allegedly) printed agricultural text in his 1523 *Boke of Husbandry* (with several later editions), while Thomas Tusser published his first and highly popular edition of *One Hudredth gode pointes of husbandrie* in 1557 (Prothero 1912).
Porter (2000, p306-7) points to evidence of the emergence of what, in contemporary terms, would be considered print-based agricultural extension material:

From early works such as John Houghton’s periodical, ‘A Collection for the Improvement of Husbandry and Trade (1692-1703)’, and Timothy Nourse’s ‘Compania Foelix, or a Discourse of the Benefits and Improvements of Husbandry (1700)’, agricultural improvement was publicised by a vast new instructional literature.

By 1800 approximately 200 agricultural authors were published in Great Britain (Prothero 1912, Swanson 1984). By and during the 17th century in England, a whole new body of literature emerged, spelling out in unprecedented detail the techniques and benefits of improvement (Wood 2002).

Although it is difficult to gain an accurate insight into the volume of agricultural books that were published since the advent of the printing press, Fussell (1947, 1950, 1983 and 1984) lists the growth of English farming books, as shown in Figure 26.

Figure 26: Growth of English farming publications 1523 to 1860.

<table>
<thead>
<tr>
<th>Period</th>
<th>Number of Titles</th>
</tr>
</thead>
<tbody>
<tr>
<td>1523 – 1730</td>
<td>approximately 400 titles in approximately 200 years</td>
</tr>
<tr>
<td>1731 – 1793</td>
<td>approximately 500 titles in approximately 60 years</td>
</tr>
<tr>
<td>1793 – 1839</td>
<td>approximately 400 titles in approximately 50 years</td>
</tr>
<tr>
<td>1840 –1860</td>
<td>approximately 400 titles in approximately 20 years</td>
</tr>
</tbody>
</table>

This rate of increase in agricultural publications for England alone suggests that the number of publications (titles not print run) rose from an average of 2 per year in 1523 to around 26 per year by 1860, or put another way, agricultural publications per year increased 13-fold from 1523 to 1860. One can only wonder what this figure has come to be in the 21st century across the western agricultural world alone. This cumulative increase in publications indicates that the volume of information being circulated to farmers rapidly exceeded farmers’ capacity to absorb it, which in turn led to a need for alternative extension mechanisms other
than published books.

Publication rates and hence circulation levels in Britain and later Europe were spurred by copyright laws which established that after a maximum of twenty-eight years text became part of the public domain, which led to the collapse of publishing cartels; while in the early 1700s London lost its monopoly on printing. On these factors Porter (2000, p86) concludes ... *thus, more made its way into print more cheaply*.

**Original extension practice and the off-farm domain**

As outlined in Chapter 3 and re-recapped at the start of this chapter, the method of *archaeology* requires analysing the positions that are established between human beings, and in this context is applied to the emerging role of the *agricultural author*, and as a consequence, the changing role of farmers.

The attempt by authors and scientists to make their work and results understandable to lay farmer audiences, through some degree of on-farm contextualisation, marks a major step in the origination of extension. Significance lies in the fact that these authors recognised the need to select from and summarise their findings to re-express them within a framework of farming practices and production targets that were meaningful on-farm. The complete scientific or research process was not documented in full to farmer audiences, but rather the practical uses and farm management changes required to tap potential on-farm gains were conveyed.

A critical point about the content of printed extension material is that the context from which an agricultural author drew his/her results was moving increasingly further away from its traditional on-farm context. Agricultural authors began to investigate other intellectual arenas, such as chemistry, and bring this understanding to agriculture, as Bacon had done, and others such as Phillip Emanuel von Fellenberg in Switzerland (Jones and Garforth 1997). Increasingly, authors no longer relied solely upon direct or personal on-farm experiences and
experiments or trials to advance agriculture. This departure was possible because of economic conditions supported by agrarian capitalism (including land enclosure) and the growing bank of information produced by scientific enlightenment that facilitated regular trans-disciplinary forays by agricultural authors into off-farm domains of intellectual exchange (Wood 2002).

Although the immediate impact of the commercial printing press during the early to mid-Renaissance period was moderate, the critical point is that the onset of print media as a communication tool caused a separation between authors and their audience of farmers. The advent of commercial publication created the initial gap that continued to increase the relative distance between farmers and authors, in physical, social, intellectual and economic proximity. This separation is supported by Porter (2000, 87) who identifies a new breed of critic that can readily be transposed to describe agricultural authors:

The print boom bred new varieties of men of letters. ‘In opulent or commercial society,’ observed Adam Smith, theorist of the division of labour, ‘to think or reason comes to be, like every other employment, a particular business, which is carried on by a very few people.’ Among the emergent breeds was the critic, that self-appointed judge, censor and reformer.

Further evidence of innovative agricultural thinking having become a detached, off-farm, and somewhat exclusive process is noted (albeit negatively) in the comments of David Hume who maintained (in 1741, Porter 2000, p88) that ...

‘the separation of the learned from the conversable world’ had been ‘the great defect of the last age’; learning had ‘been as great a loser by being shut up in colleges and cells’, while philosophy had gone to ruin ‘by this moping recluse method of study, and became as chimerical in her conclusions, as she was unintelligible in her style and manner of delivery’. Where lay the fault? Thinking had been monopolised by self-absorbed academics ‘who never consulted experience in any of their reasonings, or who never searched for that experience, where alone it is to be found, in common life and conversation’.

This division between farmers and authors is key to a long run understanding of the origins of what has become a great divide between the on-farm and off-farm domains, or in terms of professions, between practitioners of agricultural RD&E
and ordinary farmers.

An additional impact of newspapers and magazines that cannot be overlooked is the fact that the relentless demands of newspapers and magazines for copy turned authorship into a trade (Porter 2000, p82). Without doubt this had been made possible by the liberating effects of agrarian capitalism originating in England that enabled a growing proportion of the population to sustain themselves through means other than agriculture (Wood 2002). By 1700 the phenomenon of author by profession had emerged as a new position within the range of occupations in England (Porter 2000).

One way of further demonstrating and hence better understanding the separation of farmers and authors is to assess how one could understand the other’s perspective (after the rise of print publication). In terms of the method of archaeology, the following attempts to outline the relations between different subjects who were involved in the development of extension, for example, people engaged in the roles of farmers or and authors. Early agricultural authors, with their agricultural backgrounds and often being landowners, were (still) able to identify with the plight of farmers and their on-farm concerns. This contrasts greatly with farmer’s perspective on authors. Farmers seldom knew the personal and professional experience associated with authorship, the intricacies of research, the demands of the role of giving of advice, and perhaps above all, the author himself\(^2\), who to most farmers remained a faceless entity.

The new off-farm domain of agriculture provided a forum in which authors exposed their ideas not only to end-users (farmers) but critically to their to peers, initiating debate, and subsequent revising and re-publication of the best agricultural techniques and methods available. The advent of this public forum forged a type of iterative interaction that was analogous to the process of scientific research that ultimately led to a path of continuous improvement. The emergence of scientific content within agricultural texts began to appear, with an
early example being Francis Bacon in the early 1600s, who based his observations and scientific experiments on his estate north of London - [which marked] the beginnings of the application of science and scientific method to agriculture (Russell 1966, p16-17). Many followed Bacon’s lead, as evidenced by Porter (2000, p307) when he observes ...

Agriculture looked also to science. George Fordyce, a pupil of the Edinburgh professor William Cullen, produced ‘Elements of Agriculture and Vegetarian (1765)’, promoting the chemical aspects of farming. Dr Alexander Hunter, another who trained for medical practice in Edinburgh, set up the York Agricultural Society and edited ‘Georgical Essays’, a collection of papers on agriculture published in four volumes between 1770 and 1772.

**Content of early agricultural publications**
The subject matter contained within many agricultural publications was bound to be of use to farmers who physically worked the land. A brief survey of the issues upon which agriculturalists wrote included preferred ploughing animals, ploughing machinery, weeds, sewing methods, pasture species, crop and forage species, cultivation methods, estate establishment and management, enclosure farming, fertilisation and soil conditioning, feeding regimes, breeding regimes, and herd health. One typical example of improved practice concerns the sowing of wheat below the surface of the soil instead of broadcasting, which incidentally was reportedly discovered by the accident of a silly wench who mistakenly put wheat into carrot seed holes (Prothero 1912, p90)!

An interesting aside is the style in which books were written to increase the effectiveness of delivery of technical information to farmers. Fussell (1947, p8) reported that Tusser’s popular works were arranget in calendar form and written in doggerel verse, probably with the idea that rhyme would be of assistance to the supposedly sluggish brains of the rural community, who would be glad to have this kind of help to mnemonics. This approach can itself be considered a form of extension as it aims to better communicate the technical message in a manner that

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5 It would seem reasonable to assume that most, if not all, Renaissance agricultural authors were male.
most suits the farmer.

**Forms of agricultural extension beyond published books**

So far I have focused upon the origin of extension through the rise of published books written by agriculturalists. This aspect of the print revolution in agriculture is significant, but must be seen alongside other forms of both printed media and the social institutions that utilised them. By the late 18th century, newspapers and periodicals had made an impact on British agriculture, as had the formation of various social conglomerations, which together provided forums for intertwining and combining an array of extension practices.

Print media, other than books, in pre-industrial Europe, encompasses a wide range of forms, including periodicals, journals, published lectures, chronicles of societies, advertising, and newspapers. By the 1850s, the agricultural newspapers and periodicals circulating in Victorian Britain were considered by several sources to have been *a significant factor in hastening farming advances* (Goddard 1983, p116). Given the velocity and geographic depth of their circulation it seems hardly surprising that earlier claims (dated 1810) credited print media with having overcome the isolation of farmers. Several newspapers and periodicals existed prior to the close of the 18th century, although it appears that significant market penetration levels were not achieved until the mid-late 1800s. Over the period from 1768 to 1879 over 73 titles of newspapers and periodicals were recorded, each with varying lengths of publication (Goddard 1983).

In America, agricultural journalism first appeared in the form of a periodical in 1748, although only a small handful of companion periodicals came about until 1819 when *American Farmer* emerged from Baltimore. The ensuing century saw the rise (and often shortly after, the fall) of approximately 3,600 farm periodicals (including Canada), with approximately 450 journals and farm papers in circulation in America in the year of 1913 (Scott 1970).

Since the 17th century western print media has been bolstered by improved
printing technology and significantly, electronic media including radio, television, video, computers and internet communications. In combination, these modes of knowledge-transfer and communication represent a phenomenal path of growth and industry development to arrive at today’s immeasurably high levels. Contemporary Australian examples include The Land, agricultural magazines, agricultural journals, industry-specific journals, discussion forums, private and public websites, industry project forums and publications, radio programs, television programs, and national and regional e-mail discussion forums.

Extension by fairs and societies
Agricultural societies became prevalent in the 18th century in Europe and North America, the first major one being the Society of Improvers in the Knowledge of Agriculture founded in Scotland in 1723 (Swanson and Claar 1984). Earlier European examples are traceable to 1548 near Milan with others emerging later in Germany (1764), France (1761), and Russia (1765).

In England, agricultural improvement was a major pre-occupation of the Royal Society, which brought together some of England’s most prominent scientists, such as Isaac Newton and Robert Boyle, with some of the more forward looking members of England’s ruling classes — like the First Earl of Shaftesbury, mentor of the Philosopher John Locke, and Locke himself, both of whom were keenly interested in agricultural improvement (Wood 2002, p81). In addition the agricultural committee of the Royal Society of Arts (1754) gave prizes for innovations, and enthusiasm for progress found expression in the foundation of agricultural societies such as the Bath and West of England (1777) Porter (2000, p308).

Across the Atlantic the American Philosophical Society engaged in agricultural topics, as of 1744. This organisation preceded a steady stream of ensuing societies and clubs supporting agricultural improvement in the United States. Agricultural fairs were most popular in America during the 1850s to 1870s, although their existence can be traced to the first quarter of the same century with the fair
movement [following] hard on the heels of the frontier as it retreated westward (Scott 1970, p16). Similar fairs or festivals existed in Europe, such as those held at Fellenberg’s experimental farm named Hofwyl (Jones and Garforth 1997). In Australia these events persist today but are often referred to as field days such as the annual Tocal Field Days in NSW.

**Institutionalising the off-farm domain: tertiary agricultural education**

Having used Foucault’s methods of archaeology to identify the origin of extension practices regarding the analysis of the positions established between human beings, and, describing surfaces of emergence (Section 7.1), this research turns to examine the rise of relevant institutions and the authority they asserted with regard to the development of extension.

Possibly the earliest proposal for the establishment of a formal educative agricultural institution came through Britain’s parliament in 1723 by Lord Molesworth (Prothero 1912). A more significant development in British agricultural research and education was the establishment of the first English-speaking Chair of Agriculture, at Edinburgh University in 1790 (Richards 1985). As the new Chair, Dr Andrew Coventry’s lecture syllabus was **Discourses Explanatory of the Object and Plan of the Course of Lectures on Agriculture and Rural Economy** (Richards 1985). This position brought with it an undergraduate course on agriculture that attempted to combine the relevant aspects of knowledge and theory from the Faculties of Medicine and Chemistry into practical applications for contemporary farming practices.

In the following decades various colleges were set up in conjunction with Edinburgh University and the demand for agricultural institutions of varying types has sustained their existence to the present day. The first Continental academy of agriculture (probably) emerged in Florence in 1753 as the Academio Dei George, and the first Continental chair of agriculture was in Padua in 1764 (Falvey and Mathews 1999).
In America the first agricultural professorship was formed at Colombia College in 1792 (Scott 1970) and was combined with the subject areas of natural history, chemistry and agriculture. The well known Land-Grant system was later introduced (in America) under the Morrill Acts of 1862 and 1890, under which agriculture was a major stream of education for a deliberately targeted larger portion of working class Americans. Land and resources were granted to each state to establish colleges, as well as agricultural experiment stations, while extension was explicitly promoted as a mechanism for disseminating technological improvements through the Cooperative Extension Service as of 1914 (NASULGC 1999, Williams 1968).

**Archaeology of Australia’s extension experience**

This section provides an archaeology based outline of the history of extension in Australia, which is necessary for linking the European origin of extension to PPP and present day conditions. The origination of extension practice in the United Kingdom, Europe and later in America, was well established before Australia had been colonised by the English. More specifically, extension was being practiced well before Australian farming practices became significant. Hence, Australia was in a position to benefit directly from absorbing both pre-existing technical information (such as from publications), and more importantly, the fundamental concept and value of related mediums of extension, such as circulated printed material, societies, and, formal education and research. In other words, extension already existed as a societal practice that was embedded and transferred with the British culture. For example, the printing press did not have to be re-invented in Australia, nor did the concept of universities or the value of education, and critically, the rise of the off-farm domain – these were fundamental aspects of the form of extension that Australian agents benefited from.

Australia extension in the form of agricultural education was supported by both the public and private sectors, although to varying degrees across the states due to differing political constraints (Mylrea 1990, p.1). Consequently, formal education services came at different stages, with Roseworthy Agricultural College in South
Australia being the first formal agricultural education institution to open its services to the public in 1885 (Falvey and Matthews 1999, p.10). New colleges were formed soon after in Victoria (1886) and then New South Wales (1891), and in 1897 in Queensland. Western Australia formed its first college through the pre-existing state department of Agriculture, while Tasmania developed its agricultural education within the department of Agriculture, established since 1875 (Falvey and Matthews 1999, pp13-14). Since these early times the Australian university system has embraced technical, agricultural scientific research, although the emergence of tertiary level courses on extension per se – such as those developed at the University of Western Sydney (which grew out of Hawkesbury Agricultural College) have been limited. In addition to university research the Australian Government has directly engaged in the conduct of research through the Commonwealth Scientific Industry Research Organisation.

Russell et al. (1989) suggests Australian extension was founded on the prominent profile or currency of science amongst leaders in agriculture, as well as the following logic of promoting education (based on the products of scientific discovery) to maximise the national interest. This is evidenced by George Throsell’s words, spoken in 1898 as Commissioner of Lands: We shall succeed. Education of the people is our first duty and must be regarded as one of the main factors [contributing] to national wealth… (Russell, Ison et al. 1989, p4). Further support for this ambitious tone was the advent of the first state agricultural institution in 1898, in Western Australia, that was charged with the objectives of being chiefly educative and protective as announced by the then Minister for Lands (Russell, Ison et al. 1989, p.4). Furthermore, Henry Parkes, as Premier of the colony of NSW, argued not simply for the establishment of agricultural colleges… but also for model farms, tests farms or experimental farms – I would call them education farms… (Falvey and Matthews 1999, p.3).

Russell, Ison et al. (1989) traced the history of the Australian Agricultural Extension Conference (AAEC) to map the meandering properties of extension theory and practice since the early 1960s. The first AAEC opened in 1962 with a
bang. Three international speakers and 167 contributing papers combined to 
*convey a sense of great optimism* about the state and future of extension (Russell, 
Ison et al. 1989, p.7). With education as the bridge over which science could 
transfer its benefits to farmers, there seemed (at least to the conference 
participants) to be no restrictions inherent in the basic linear extension model that 
characterised extension up to the 1960s.

With the role of education in extension pronounced, the first conference also 
realised that a unanimously agreed definition of the scope and purpose of 
extension itself had not yet materialised. Furthermore, a deeper exposition of the 
properties of the role of education in extension had not begun to be explored. This 
latter issue is targeted by Russel et. al. (1989) as a critical flaw of traditional 
extension because it fails to demonstrate exactly who education is serving and 
how. These are particularly poignant questions as it was accepted at the time 
(partly on the basis of adoption and diffusion theory) that only a small percentage 
of (innovative) farmers actively sought to be educated.

Despite a strong start, early examples of theoretical inconsistencies are reflected 
in the AAEC of 1967 and 1973, while the 1987 conference validates the claim 
that previous extension theory and praxis was vague and ambiguous (Russell, Ison 
et al. 1989). In 1967 Wilson presented a critical review of extension under the one 
and only conference topic concerned with the impact of extension on producers. 
This review examined assumptions previously not discussed at a professional 
level, and concluded the following points:

- Blame for non-adoption could be unfairly attributed to farmers
- There was a strong belief that the more information extended to farmers the 
  better.
- Little or no consideration was given to power-relationships and social 
  conflict.
- Farmers’ needs were mostly ill considered, investigated or validated, 
  despite extension being widely touted as a two-way medium for exchange
between farmers and extension practitioners.

The fourth AAEC provides positive identification of Wilson’s expectation that farmers were being blamed as the barrier to successful extension. This is clear from the fact that conference participants commonly referred to farmers as having a ‘motivation problem’, with respect to their often negative attitude towards learning by institutionalised coursework (Russell, Ison et al. 1989, p.11). Simultaneously, the conference recognised the success of relatively new district programs that facilitated a high degree of direct farmer involvement in the problem solving processes of extension. Again, a mismatch was obvious between the expectations of extension agents and those of farmers, particularly in terms of the means for achieving successful extension ends/outcomes – the meaning and implications of which were still not consensually defined.

Amidst waning enthusiasm for Technology Transfer-based approaches to extension, the FSR movement is recognised to have emerged during the 1960’s and 1970’s, particularly through the experience of rural projects being delivered in developing countries. Of note was the fact that small scall farmers in poor regions were not having their needs met by technology driven project delivery. Although technological development and its application continued to drive the productivity increases of Western agriculture, the externalities from such practices were increasingly difficult to ignore and the transferability of scientific research results that had been generated under off-farm conditions were becoming less tenable for farming families to adopt without more localised information (Dunn 1997, McCown 2001, Packham 2003, Vanclay 2004).

In essence, FSR found space within the field of extension when the pre-dominant technology driven and isolated problem-based approaches began to falter in terms of farmer adoption, and FSR took a very different view that incorporated the whole farm as the base (or minimum) unit of operation that operated within an inextricably linked social system. Collinson (2000, and as also cited in Packham 2003) notes that FSR developed from the ground up, based on the experiences of
field officers working in developing countries, which ultimately led to FSR emerging as a diagnostic process including four stages of 1) diagnosis; 2) design; 3) implementation; and 4) evaluation. In the earlier years FSR maintained the objective of improving the well-being of farming families through productivity increase, although this approach evolved to emphasise sustainability and stability (or resilience) of the farming system.

This amended FSR focus was the starting point for PPP to engage farmers. Although the need to deliver improved management practices was clearly present, the PPPLT emphasised that farmers needed to be comfortable with the changes that were to be adopted, and the only way for that to occur was for farmers to participate fully in the learning and research processes from beginning to end. PPP aimed to provide farmers with the opportunity to develop local, group-based social processes that could, and hopefully would, be established for the farmers to utilise as often and as for as long as they chose.

The FSR approach is also relevant to the discussion of this Chapter 7, because FSR recognised the distinction and effective gap between the on- and off-farm domains of agricultural development. Röling (1988, p187) implicitly supports this, stating that FSR ... [can be seen as an effort] to improve the interconnection of the agricultural information system. That is, the FSR approach was critical of researcher led technology solutions for adoptee farmers, but did not advocate that farmer participation should be isolated and paramount above all other stakeholders. Rather FSR, like PPP, promoted a forum for dialogue that was inclusive of all relevant stakeholders regardless of whether they resided (in a professional sense) on-farm or off-farm.

Also mentioned in Section 2.4.2, the Farming Systems approaches developed at Hawkesbury Agricultural College (now UWS) were pertinent to the formation of PPP and its use of AL/AR as a means for bridging the gap between farmers and learning/research outputs and outcomes. The Hawkesbury model recognised agriculture as the interface between natural and social systems, which includes
both hard and soft systems approaches to best manage the application of ecological knowledge and discoveries within the broad domain of agricultural production activities (Packham 2003). PPP understandably had these attributes built into it, largely because it emerged as a project proposal to which UWS-Hawkesbury School people had contributed. PPP could also be seen as one of the few tangible examples of a an industry funded project that held a direct link to the Hawkesbury approach to FSR, given that a reduction in the prominence of the Hawkesbury School has continued since the departure of its major advocate, Richard Bawden.

By 1987 the Australian political and economic landscape for agriculture had changed dramatically. The arrival of economically rationalist principles within the public sector induced budgetary tightening and ushered in the introduction of user-pays operation. Within this change it is important to note that information provision was essentially now being considered more a private than public good (Marsh and Pannell 1998, p.1). As a result extension agencies were forced to question (at least in accounting terms) whom it was extension was benefiting, what it was worth, and who should deliver it. State governments around Australia have increasingly been unable to support on-farm based extension services to individual farmers, and instead have tended to specialise as wholesaler[s] of technical information to the private sector that would replace the previous state provision of extension to individual farmers, or in some cases, such as South Australia, the entire extension sector has been privatised (Russell, Ison et al. 1989, p12).

The above archaeological research on the European origin of extension and Australia’s extension experience has argued that the advent of print media, formal research education institutions, and sufficient economic conditions induced agricultural research to be divorced from on-farm practice. Although in its infancy, a new off-farm forum upon which agricultural RD&E could develop had arrived. Together, print media and tertiary institutions transferred agricultural
research to off-farm, thereby creating the need to return the results back on-farm for farmers to implement, which is a key objective of agricultural extension, regardless of the method used. With so much agricultural research and knowledge generation occurring off-farm over recent centuries, there is clearly a critical need for the transfer process of knowledge back onto farms to be effective and efficient. The above historical narrative is analysed in Section 7.4 (below) using Foucault’s method of genealogy. In order to link the past to the present context of PPP a description of the intrinsic interactions between PPP and its institutional operating framework is required, particularly in terms of the role of government agencies.

The role of state and federal government agencies in PPP
Australian state and federal governments have supported and contributed to the existence and delivery of extension, although over the course of the 20th century the form of these contributions has varied greatly. In general terms, the State identified extension as a means for advancing the national interest through stimulation of the agricultural economy through higher production yields, lower costs and improved productivity. Williams (1968) states that market failure (under-investment by private sector) in agricultural extension, and education generally, were prime justifications for government intervention. Government support has witnessed the establishment of scientific research centres (such as the CSIRO) to contribute to technological innovation, and, the public provision for advisory services within state and territory jurisdictions (to varying degrees).

Within PPP the role of the off-farm government agencies was critical, although the state department of agriculture (NSW Ag) was significantly more noticeable than that of the federal counterpart (Department of Agriculture, Fisheries and Forestry, DAFF).

DAFF was a significant player at the Dairy Australia level of industry agenda determination. Given that Australian tax dollars were being contributed to DRDC research programs, including PPP, it is expected that the government wanted to
have its say in the way funds were used. Although the specific funding of PPP may not have been an agenda item for discussion between the then DRDC board and DAFF officials (or the Minister for Agriculture), the participatory approach of which it was apart, most certainly did. Issues and concerns about the effectiveness of research and development dollars going into agriculture gave PPP an opportunity to pilot the farmer-driven agenda backed by industry approved financial support. This trend was not without its critiques as funding bodies also perceived a risk associated with shifting the focus on farm management research spending from clear cut outputs to relatively elaborate process implementation.

DAFF also played a direct role in PPP, facilitated by my connections of previous employment with the Australian Bureau of Agricultural and Resource Economics (ABARE). On several occasions PPP invited federal level government speakers to address PPP farmers – which was intended to create more dialogue between diverse but connected stakeholders (that is, farmers and federal public servants). This linkage proved successful as speakers were well received but the national focus of DAFF and it’s employees meant the connection was unlikely to ever become a strong relationship. In addition I was initially interested in using ABARE collected data to assist with describing RDG characteristics in terms of farm physical and financial variables, but this was eventually recognised as untenable due to the highly localised nature of the information PPP required for which ABARE data was generally not statistically valid.

NSW Ag played a major role in PPP, both as a project partner in the PPPLT and in its delivery throughout the DIDCO network. As a project partner DPI influenced the design and management of PPP through participation in PPPLT meetings. This input was influenced by the nature of the NSW Ag representative on the PPPLT, who had a strong Positivist, science research background but also saw opportunity for the application of AL/AR to achieve situation improvement. As such the impact of NSW Ag at the PPPLT level did not have major consequences on the overall desired style and operation of PPP as a farmer-driven project.
Given that PPP was partially funded through NSW DPI, it was built into the project structure that NSW Ag field officers be available to assist with PPP activities within each dairy region. This amounted to an enormous resource contribution to PPP because each relevant NSW Ag officer was officially allowed to contribute a portion of their time, office resources, travel costs, and often venues to the benefit PPP farmers. This opportunity was exercised by the PPPLT and NSW Ag officers were engaged in all possible circumstances, although this led to some difficulties. The prime one being that many NSW Ag staff were perceived to still be operating under a Technology Transfer paradigm, and that their appreciation of the values of PPP (based on FSR) could not be taken for granted and indeed had to be thoroughly discussed and debated (Diarised Journal). On several occasions I was asked to present the principles of AL/AR to NSW Ag staff (including those not involved in PPP) as part of their internal work program and professional development meetings.

7.4 Genealogy of agricultural wisdom
In applying Foucault’s concept of genealogy I aim to explore the position that farmers hold in contemporary RD&E, including PPP, in light of the emergence of the origin of extension and the off-farm domain, with particular focus on the rise of tertiary institutions of agricultural research and education. Whilst the historical agricultural archive and use of archaeology provided an account of why, how, when, and where extension originated, it also illuminates the reality of the position and status of the farmer being transformed and subsequently treated as a subject of extension (and its proponents). Rather than looking at what structures, statements and consequences archaeology revealed for us, genealogy is concerned with linking (my) present-day concerns regarding PPP – that of farmers’ status within PPP and extension generally – to the above archaeological findings.

The rise of tertiary agriculture
Using Foucault’s concepts of power and knowledge as a reference (Chapter 3), this section examines the growth of extension through the advent of tertiary
agriculture.
Put simply, science-based research represents knowledge, while the university system represents a major form of institutional power within society. When agriculture joined the university system (for example, the first Chair of Agriculture at Edinburgh University) both sides entered a long and unbroken relationship.

Foucault asserts that *each society has its own regime of truth, ...that involve mechanisms and instances which enable one to distinguish true and false statements ...* (Gordon 1980, p131). The significance of the off-farm domain and specifically tertiary agricultural institutions is demonstrated by their capacity to generate and deliver *truth* to the sector.

Foucault was also concerned with expertise, *insofar as it empowered a radical extension of the capacity to govern ...the history of the professions becomes an important aspect of the transformation of power associated with the emergence of governmentality*, both of which are relevant to the birth and development of professional extension practice (Johnson 1993, p142).

Institutionalised tertiary agriculture placed its proponents (university employed agriculturalists) in a position of authority within agriculture. The source and strength of authority came not only from the status and respect accorded to tertiary publications and training, but also from the reputation, resources and influence exerted by universities as institutions within society. Tertiary level agriculturalists received the benefits of being formally aligned with universities from the moment of their appointment.

In my analysis, the newly evolved echelon of tertiary agricultural research and teaching quickly required the full-time employment of tertiary agriculturalists to keep pace with research programs and teaching commitments. This decisively increased the already wide physical, intellectual and social gap between ordinary farmers and tertiary agriculturalists. Prior to tertiary agriculture, published authors
generally relied on their farm (or farms) as a source of income (for example Bacon, Fellenberg, Fitzherbert and others). This literal grounding of agricultural development processes to the on-farm domain was severed by the alternative career path and income source provided by universities and publication royalties, and can perhaps be metaphorically conveyed as the cutting of the an umbilical cord between on-farm management and off-farm research activities that enabled the off-farm domain to grow increasingly independently of the on-farm domain.

Today agricultural academics, researchers and extensionists rarely personally practice farming to sustain themselves — except perhaps in a hobby capacity. Within agriculture generally, sub-industries of research, agricultural development and extension have emerged that support large numbers of constituents — all of whom have members with skills relevant to agriculture, but few members who actually live and work the land to sustain themselves.

The Australasia-Pacific Extension Network (APEN) is a good example of the absolute segregation and institutionalisation of the extension sector from farmers. Although APEN recognises that its members are largely employed to service the on-farm domain (farmers), it is clear that APEN itself exists to support extension agents working in the off-farm domain. Figure 27 shows that APEN’s overall objective reveal no explicit references to farmers or their needs, but is directly aimed at supporting extension professionals, who in general are not farmers.

**Figure 27: Vision, role and goals of Australasia-Pacific Extension Network.**

| **APEN’s vision:** APEN is the peak body for change management professionals. |
| **APEN’s role in contributing to the above vision:** To provide a platform for networking, professional development and representation of members’ and the profession’s interests. |

(APEN 2004)

**Contemporary on-and off-farm domains and PPP**

My observations of the Australian dairy industry (as with western agriculture generally) suggest it exists as two separately defined domains (although they are linked in complex ways). These are, as previously mentioned but not specifically
defined: the on-farm domain, encompassing all on-farm activities that contribute to agricultural production; and the off-farm domain, comprised of all activities that occur beyond the farm gate including non-tangible pursuits such as innovative thought processes. Many agricultural activities occur off-farm, such as trade negotiations, political lobbying, policy formation, marketing and selling of agricultural equipment etc, but for the purposes of this investigation I am concerned with agricultural RD&E. This includes any scientific research that is relevant to the on-farm domain, agricultural economics, rural social research, and extension research and delivery.

In this context farmers (obviously) have a high level of presence in the on-farm domain — indeed they are the key people involved in its existence — but they have a low level of presence and contribution to the off-farm domain. Based on PPP observation, the reasons for farmer absence in the latter are obvious: farmers are kept on-farm primarily because that is what they do, the practice of farming is a farmer’s (full time) occupation and this application of their time and resources (physical, financial, intellectual) anchors them to the on-farm domain. In support of this view it would seem reasonable to suggest that relative to the total population of dairy farmers in NSW (and of farmers worldwide) an extremely small proportion (of farmers) leave their on-farm domain to participate extensively in the off-farm domain. Quantifying this proportion may be impossible, but my observation of the NSW dairy industry suggest this is true, and concurs with the PPP assumptions outlined at the beginning of this chapter.

**Farmers as subjects of extension**

The advent of tertiary research cast academics as experts partly because of their capacity to specialise their off-farm research efforts, but simultaneously rendered farmers as peripheral to the heart of the processes of agricultural research, development and extension. From this period in agricultural history onwards, farmers were increasingly excluded from a significant share of the power that resided with university departments of agriculture and which increasingly influenced the formation of agricultural research agendas, what passes as valid
wisdom, and, to whom tested knowledge is best targeted.

In light of this scenario, RD&E practices can, and arguably have, acted on farmers as \textit{raw materials} as referenced by Kendall and Wickham (1999) in Chapter 3. Within the dominant technology transfer paradigm of the 20\textsuperscript{th} century, farmers were viewed, labelled and acted upon as agents of change because they (farmers) also comprise a collective that can be utilised to promote the national interest, particularly in economic and environmental issues. Extension plays a key role as the facilitator of this mechanism in the interests of the individual farmer, his or her own industry, and ultimately, the Australian community. The creation of the two domains of on- and off-farm created this role for extension as a linkage, although interestingly extension itself appears to have little influence (if any) on the content of the off-farm determined agenda it is usually employed to implement.

In general, individual farmers do not play a significant role in the off-farm domain of agricultural research, except perhaps as instruments of implementation for scientific advance, or as end-user adopters of the products of science. Evidence of this exists in accounts of the history of extension in Australia, whereby farmers were perceived and treated as \textit{empty vessels} that simply required adequate filling with technological information to induce technology adoption (Russell et al. 1989). Understanding the reasons for this farmer absence in the off-farm domain can perhaps be better understood and explained in the following analysis.

The prescriptive nature of printed extension material, combined with the forces of power and forms of knowledge present in print media, raised the authority of authors and rendered ordinary farmers as \textit{the subject} of agricultural extension. Farmers were for the first time beholden to and subjected to the written wisdom of authors on a scale that was previously impossible. At this point a shift in the agricultural research focus is identified. Prior to the rise of print media and the birth of extension, the \textit{subject} of rural production improvement was \textit{the farm}. With the advent of print media extension practice, the focus of agricultural
research was increasingly relocated to the farmer, with all efforts directed to influencing his/her behaviour.

**PPP’s off-farm context for dairy research funding**

One clear product of this transfer of focus onto the farmer as the agent of change to be influenced, was that the status and capacity of farmers to be direct contributors to agricultural agendas and knowledge generation was limited. This is primarily because these functions became consumed by the off-farm domain and its stakeholders. This situation has been sustained over time as identified in the PPP assumptions (above), and it could be reasonably argued today that farmers are generally not involved or represented in the establishment processes of agricultural research departments, or in their research agendas and implementation. PPP related evidence supports this notion even in terms of farmers as students of tertiary agriculture organisations, as the vast majority of farmers within PPP had not attended a tertiary institution. A genealogical approach reminds us that this fact of farmer absence or exclusion is true despite farmers being the very people that tertiary agriculture is aimed at helping.

Currently in Australia, institutional centres of agricultural education and research take the form of universities and colleges but are also joined by a plethora of independent and interlinked government departments, statutory authorities, non-government organisations and private sector organisations. As with many Australian agricultural industries, dairy industry research funding is influenced by an economically rationalist policy whereby a user-pays principle applies. For example, dairy farmers contribute 50 per cent of industry research funds through a levy on their milk production (with the federal government matching this amount from general tax revenue) hence the benefits from this research are largely paid for by users, while the other fifty percent is deemed to be satisfying the tax payers’ national interests.

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6 In 1999-2000, an average of 9 per cent of NSW dairy farmers (6 per cent nationally) held a tertiary level qualification (ABARE 2000).
This context is relevant to PPP because it relied heavily on industry research funds from the off-farm domain, along with in-kind contributions from stakeholders. Under these conditions PPP recognised the gap between dairy farmer’s financial contribution to research levies and the agenda for which those levies were spent. In other words, PPP recognised that off-farm domain processes for allocating dairy research dollars are significantly separate, and arguably completely detached, from the original on-farm source, that is, farmers and their daily operations to commercially produce milk (usually harvested at least twice per 24 hour period no less!). In response to this situation, PPP endeavoured to redress the perceived lack of farmer control over the research agenda by directly allocating PPP funds to farmers in their Regional Dairy Groups and by encouraging farmers to set their own agenda for localised learning, research, farm development and extension activities. Dunn et al (2003) report the successful results of this approach for one specific (PPP) Regional Dairy Group, noting the value of farmer ownership of the process, particularly regarding financial control which was a distinctive feature of the PPP approach to implementing AL/AR. The PPP approach resonates with other similar projects, such as Webber (2000, p186) in terms of empowering farmers to participate directly in research processes by increasing their control of processes: ownership of design, action and outcomes, Carberry’s (2001) case studies of farmer participatory and scientifically rigorous projects using AL/AR, as well as with the genuine participation espoused in Race and Buchy (1999) and Vanclay’s (2004) social principles for agricultural extension.

**PPP experience of the on- and off-farm domains**

PPP endeavoured to bring the on- and off-farm domains closer together. It went further than merely attempting to build a bridge between the two domains, but rather attempted mutually included both farmers and off-farm domain stakeholders from the outset. PPP rejected the traditional approach of connecting farmers with the research products of the off-farm domain using one-way information delivery (Technology Transfer) and instead provided farmers with a forum within which they could both engage in agenda determination of research
dollars (within PPP) and importantly play a greater role that was equal with the status off-farm stakeholders such as scientists, technicians, project managers etc, in the implementation of their chosen research agendas.

The success of PPP in creating a range of farmer forums (as identified in Chapter 4) has implications for the on- and off-farm domains of agriculture that stemmed from the Early Renaissance period in Europe. Firstly, it would seem these domains of agriculture are a valid and useful way conceptualising and locating all stakeholders within agriculture for better understanding the nature of the relationships they (stakeholders) maintain with each other. By better understanding each other’s perspectives in the context of the origin of extension and the on- and off-farm domains it would seem plausible that participatory RD&E processes such as AL/AR could be significantly more effective and efficient.

Secondly, the conceptualisation of the on- and off-farm domains of agriculture provides a fresh perspective on their divide that does not imply judgement or seek to allocate blame for the nature of the relationship between the on- and off-farm domains; rather it is based on a relatively value-free investigation of a long-run historical narrative about the origin of extension within agriculture.

Thirdly, and perhaps most importantly for the future of agricultural research and effective on-farm change, a recognition of the existence of the on- and off-farm domains enables stakeholders from both sides to engage in dialogue that explicitly accepts there is a division between the on-farm domain and other stakeholders. By recognising this position as a starting point, the task of linking the two domains by navigating a path for all stakeholders towards more effective relationships is clearer because both domains begin with an explicit awareness of their respective differences and virtues, as well as an appreciation of what self-governing actions might be required to move each domain closer to the other in pursuit of better outputs and outcomes sooner. Improved dialogue and more effective relationships between the on- and off-farm domains of agriculture are fundamental
progressions that always valued and worthy of pursuit regardless of the national, state, regional or local objectives being sought, such as production, profitability or environmental sustainability (Leeuwis 2004).

**Concluding comments**

This chapter explored the nature of agricultural extension and the role of farmers by looking beyond the form of contemporary extension practices to identify the fundamental founding origins of extension. This work comprises a meta-research process that relates to the tertiary tier of research, as presented in Figure 4 (Chapter 1). The European origins of extension were taken as the historical background for the advent and development of Australian extension, including FSR and the role of state government departments of agriculture relevant to PPP. This chapter, in combination with chapters 5 and 6 provide the content and discussion of this thesis, with the implications and conclusions drawn from these chapters (5-7) presented in Chapter 8.
Chapter 8 — Implications and Conclusions

This chapter discusses the implications of research presented in chapters 5-7 with respect to the original research question within the primary, secondary and tertiary tier framework (Does Action Research provide an effective methodology and method(s) for enacting farmer-driven research?).

Specific practice and theoretical recommendations are suggested for the dairy industry (NSW and Australia), for Action Learning, Action Research, and agricultural extension.
8.1 Primary tier research implications

With respect to the NSW dairy industry, evidence outlined in Chapter 4 and reported to Dairy Australia (2003) indicates that, overall, the PPPLT’s application of AL/AR methodology and related methods were indeed effective for enacting farmer-driven research. Although fluctuations occurred, farmer participation within PPP generally met a minimum expectation both in terms of the number of farmer-run activities, and the number of farmers per activity. Farmer-run activities were effective because they resulted in local level learning, on-farm development and practice change, qualitative research outcomes, and in some cases scientifically valid quantitative research outcomes.

Within these activities the AL/AR methodology provided a philosophical paradigm that determined the nature of conduct by all within PPP, including farmers, the PPPLT, and other participant stakeholders. The AL/AR methods applied in PPP were similarly effective, in a general sense, for meeting the PPPLT’s goals and, critically, farmer’s goals for on-farm improvement.

PPP presented a continuous learning process that simultaneously informed farmers and project management by linking their dialogical processes. The PPPLT’s commitment to self-reflection enabled learning from early project stages to be fed back into decision-making processes and improved subsequent project management.

As documented in chapter 5 this research recommends that the dairy industry could use farmer reflection within AL/AR processes to fulfil accountability requirements in participatory research, including non-written submissions. Similarly, reflective practice based on the principles of AL/AR could be overtly incorporated more broadly into industry projects and not only to projects classified as participatory. The use of various types of farmer forums have merit for increasing project participation, particularly by farmers but also relevant stakeholders (non-farmers). Similarly, they are useful for promoting project transparency and reflective practice within industry development processes. The
forums of farmer conferences and use of teleconferences better connected
stakeholders and enabled increased and cost-efficient participation by a greater
number of farmers and stakeholders throughout the NSW dairy industry (than
would otherwise be the case). Reflective practice within PPP demonstrated the
effectiveness of AL/AR processes to generate project transparency by
documenting farmer (and stakeholder) reflections about PPP activities. There is
potential to use these farmer forums in appropriate conditions beyond the NSW
dairy industry.

The following guidelines are recommendations for how future participatory
projects could better utilise AL/AR to meet industry objectives.

- Differentiate, clearly and consistently, between AL and AR processes.
- Accept that AL/AR processes need not be rigidly structured around the
discrete steps of the plan-act-observe-reflect cycle. Perhaps in practice
Checkland and Holwell (1988, p163) provide a flexible approach to
enacting a step-wise cycle:

   Most users, inevitably, start with a step-by-step version of the approach
   (SSM/action research); but once it becomes familiar, and experience with it
   accumulates, the user can begin to take it as given and can use it more flexibly.
   Eventually it becomes thoroughly internalised – it becomes an adopted ‘way of
   thinking’ which does not itself have to be thought about at all, and then
   ironically, it becomes more useful than ever!

- Accept that participants who are new to AL/AR may require action to
be initiated on their behalf before they fully engage with the process
and appreciate the value of the methodology and methods of AL/AR.
- Identify that an AL/AR process is comprised of at least five key
elements, all of which are critical for conducting effective AL/AR, and
that each must be addressed at some point or multiple points within the
process. The timing and frequency of addressing these elements is
contingent upon the context of the AL/AR process and is best
determined collectively by participants and ideally should be made
explicit. These were stated with respect to PPP in chapter 5, and are
reproduced here in generic terms.
i. **Democratic framework**
   Ensure a democratic framework within group processes. All stakeholders have equal right and access to express their voice regardless of their knowledge base, professional status, educational status or other means of distinction.

ii. **Context**
   Action is taken in the real world to ensure project relevance is high, rather than single issues being extracted from the real world and investigated in isolation from the reality of multiple parameters resulting in research efforts that are abstract and of low relevance to the context being investigated.

iii. **Diversity**
   Encouragement of diversity within groups. A wide range of participants is recognised as critical to capitalising on the intellectual power of a group of co-researchers.

iv. **Farmer-driven agenda**
   Farmers are the originators and predominant determinants of setting the agenda of issues to be investigated, and farmers are integrally involved and aware of the implementation process for the chosen agenda. For example, within projects this may translate to farmers being in control of funds. Aspects of Emancipatory AR/AL must be present.

v. **AR/AL cycle**
   The cyclical steps of plan, act, observe, reflect, with the process of reflection being critical.

Conversely an AL/AR process is less likely to be effective if the elements of AL/AR are delivered to participants in a prescriptive fashion, which itself is contrary to the principles of AL/AR and specifically Emancipatory AL/AR. The five key elements of AL/AR provide both a guiding methodological framework and a basis for methods when conducting AL/AR.

A logical implication of these findings and recommendations for delivering AL/AR is highlighting the importance of facilitation. The nature of facilitation required to deliver AL/AR to farmers and agricultural stakeholders clearly must be tailored to meet the needs of the participants, whilst recognising that each group of participants will exhibit different characteristics and hence have differing facilitation needs, even if only subtle.

Research findings in Chapter 5 on Farmer Forums showed that the social structures developed in PPP enabled farmers to embark on effective AL/AR processes to generate learning and research outcomes. Within PPP the role of
farmers in industry projects was re-regulated to facilitate increased levels of farmer autonomy to govern their immediate learning and research agenda, as well as its implementation and subsequent uses.

In addition to promoting reflection processes, Farmer Conferences are potentially a way in which industry bodies such as DIDCO can add value to projects involving farmers. Adding value to a project can take the form of exposing it to a wider audience, with the intention of positively influencing a greater number of farmers, as well as to increase and improve the public image of an industry. Farmer-oriented forums at which farmers present learning and research results could be utilised to more widely disseminate findings, through existing industry communication channels (such as industry newsletters etc), but also, where appropriate, through industry-specific (for example, Australian Dairy Farmer magazine), agriculture-specific (for example the ABC’s Bush Telegraph program) and mainstream media services (such as broadsheet newspaper and mainstream television).

In the face of negatively impacting events, such as deregulation and drought conditions or any significant introduction of change, the value of personal exchanges amongst farmers cannot be underestimated, based on the positive responses of farmers to the third PPP Farmer Conference. Although this unexpected social purpose of these forums is difficult to quantify, there appears to be little doubt that the social fabric of farming communities stands to be enhanced when farming communities are better linked. This could take the form of regular wholly farmer-oriented conference forums that connect a wide range of farmers across an industry, and particularly those sections that are seldom in direct contact, for example linking south-western inland NSW farmers with north-east coastal farmers. Based on PPP experience, inter-regional farmer forums could become a regular feature of the NSW dairy industry to benefit both the rate of adoption of innovations and the social fabric.

One lesson, from PPP experience, of evaluation has been that AL/AR reflection
processes provide a successful model and mechanism for achieving industry accountability within farmer participatory projects. In this sense reflection, as defined in Chapter 6, can be tangibly enacted using Farmer Forums of the kind discussed in Chapter 5.

The benefits of using AL/AR reflection as part of industry evaluation contributes to agriculture in perhaps a similar way to that of the Most Significant Change (MSC) approach, which is a *dialogical, story-based technique … that involves a form of continuous values inquiry whereby designated groups of stakeholders search for significant program outcomes and then deliberate on the value of these outcomes in a systematic and transparent manner* (Dart and Davies 2003).

Regarding MSC Dart (2000, p279) concludes:

*The MSC process did not provide indication of the spread of adoption of technologies across the farming population: the model is designed to capture ‘remarkable events’ rather than the average experience of farmers. The MSC model aims to encourage learning between project stakeholders and to ‘improve’ the project, rather than ‘prove’ what the project has achieved. Consequently, if used in isolation, the MSC is unlikely to satisfy all stakeholders’ demands for evaluation.*

In a similar vein to MSC, AL/AR enables participants to convey stories intrinsic to their personal experience, particularly through qualitative documentation of reflective activity. Although this aspect of the evaluation of AL/AR is useful for eliciting personal and collective outcomes, it is not of itself sufficient for adequately documenting and reporting experience, achievement and the results of group processes. Checkland and Holwell (1998, p156) state a similar view, that: *… the essence of action research – much neglected, alas, in its literature – is the need to make sure that its research findings have a firmer status than mere story telling.*

The experience of PPP has demonstrated the capacity of AL/AR processes to reach beyond purely qualitative evaluation. Within PPP’s farmer-driven learning and research processes, RDG activity resulted in quantitative (as well as qualitative) findings, such as the establishment of silage feeding data. The
capacity of AL/AR to generate both quantitative and qualitative monitoring and evaluation that satisfy industry standards and expectations for project reporting, makes it a useful and attractive tool for industry application across the Australian dairy industry and arguably Western industrial agricultural systems.

The closure of PPP was announced to farmers well in advance of the final reporting dates, in fact the commencement of Phase 2 was perhaps considered to be the second half of the PPP *match*. Each RDG was encouraged to continue its own self-directed interest and applied pursuit of their local learning agenda, especially in the knowledge that DIDCO supported such behaviour and that future funding opportunities would always come up. Follow up evaluation of the RDGs and the impact of PPP methods is considered a worthwhile future option for the NSW Dairy industry to consider.

**Theoretical recommendations for AL/AR**

My experience of using AL/AR terminology within the NSW dairy industry, academic papers and conferences, and in dialogue with fellow practitioners has led me to believe that the future use of AL/AR by society is severely limited — even within the Australian agricultural and extension community — unless universally accepted and consistently applied terminology is established.

As a contribution to this goal I propose the Jennings and Packham’s (2001) definition of Action Learning and Action Research for use within AL/AR activities within the NSW dairy industry, the Australian dairy industry, and Australian agriculture in general. Within these definitions, the AL/AR elements that are common to both Action Learning and Action Research are considered to remain the same, such as participation, reflection on action, and situation improvement, amongst others. It is the key difference between learning and research within AL/AR theory that is clarified by Jennings and Packham’s re-casting of Action Learning and Action Research.

I do not propose that ‘AL/AR’ be used as a general descriptive term for any
Action Learning or Action Research activities, but rather my emphasis is that the specific distinctions between the two terms (Action Learning as opposed to Action Research) are recognised and applied accordingly (and definitely not interchangeably).

8.2 Secondary tier research implications

AL/AR as applied in PPP did support farmer-driven learning and research. The PPPLT evolved its conceptualisation of AL/AR theory and consequently reformed its delivery of AL/AR to the NSW dairy industry. Within the secondary tier of research of applied industry development methods, the PPPLT contributed the following recommendations for implementing AL/AR as a matter of professional conduct:

- clearly and consistently distinguishing Action Learning from Action Research,
- re-structuring the definition of AL/AR as a combination of equally necessary elements rather than a mandatory, sequential and rigid process (as might easily be interpreted from the AL/AR 4-step cycle),
- accepting that group activities can, and at times should, be initiated by the facilitator of an AL/AR process, rather than being left to local participants, and
- capturing reflection processes by local participants using a variety of farmer forums.

In light of these experiences, AL/AR provided an effective theoretical framework and participatory tool for facilitating learning. Once the AL/AR method in PPP was re-constituted by the PPPLT, it provided a more flexible structure from which both the intended participants (farmers) and project managers of an industry project could benefit through learning, associated on-farm development and research outcomes.
Given there was flexibility in PPP for the way groups relayed their experiences to the PPPLT (eg written or verbal descriptions, etc), there is potential for the industry to explore more innovative ways in which a farmer’s project experiences can be harnessed for the good of other farmers and the industry at large. For example, perhaps industry projects should consider updated technological opportunities for capturing farmer experiences like mini-interviews with farmers recorded digitally, video footage, photographic evidence, and transcripts of conversations with project participants.

A major implication for the role and practice of facilitation of AL/AR with farmers is that the facilitator, who is typically tied to an industry funded project agenda, must be prepared to represent farmers’ own individual and collective agendas. This is particularly important when there is a significant difference between the industry project agenda and the farmer agenda. In the case of divergent agendas, facilitation that is conducted in a manner that incorporates the above professional conduct recommendations is, based on PPP experience, considered more likely to achieve agreed mutual agendas in which farmers initiate and maintain a necessary minimum level of ownership and responsibility for both the AL/AR process and the content matters it’s participants are grappling with. Given most project agendas are pre-determined through industry processes, the hardest task is to ensure that farmer participants are facilitated in a way that genuinely enables and empowers farmers to influence, if not control, the agenda to the extent that they consciously recognise the value of this opportunity. In reality this may mean that the original project agenda is challenged by the farmer agenda, in which case the opportunity for project success can be maximised by working with farmers toward negotiated objectives, implementation plans, actions, and outcomes. In essence, farmers’ sense of ownership and responsibility is critical to the success of any participatory industry project, and the role of facilitation in achieving farmer commitment is key.

In response to the issues realised by the PPPLT’s application of AL/AR, this thesis conducted research that contributed to the theory of AL/AR. As a result it is
recommended that the AL/AR community recognise and embrace the importance of distinguishing between AL and AR, the further development and application of the concepts of spatial and temporal boundaries, and finally the theory of participation presented in Chapter 6.

The value of differentiating between AL and AR lies in the potentially increased appeal of AL/AR processes to those not already familiar with participatory research. Differentiation is also likely to improve the clarity of roles, aims and objectives of AL/AR processes, particularly for fully involved participants but also for part-time contributors and outside observers.

The development and application of spatial and temporal boundaries intends to better identify where an AL/AR process is located (both spatially and temporally) throughout the life of the process. This increased clarity should improve the effectiveness of an AL/AR process because it better informs the participants of the context, resources and direction of the process by raising collective awareness about the nature of the project and the roles attributed to each individual.

The development of a theory of participation is an attempt to standardise the complex interactions of group dynamics. The new participation theory presented in this thesis is a starting point upon which further research should be conducted, although it is recommended that this theory be applied by other practitioners in order to road-test the theory beyond the retrospective applications to PPP experiences that were provided in Chapter 6.

The prime objective of this theory is to distil the core components of participation, which may then be universally applied to participatory research projects in their planning, delivery, evaluation and analysis. It is hoped this theory is universally applicable, meaning that the context of participatory projects need not be intimately understood, or even known, in order to ascertain the extent to which participation has occurred. For example it should be possible for two (or more) participatory researchers to accurately assess the nature and extent of participation
levels regardless of whether the activities were conducted in the same geographic location, community or industry or were conducted with similar or different personality types or demographic characteristics.

**Future application of participatory processes**

The demonstrated effectiveness of AL/AR as applied in PPP provides cause to suggest similar participatory research techniques could in future play a greater role within the NSW dairy industry, as well as in other Australian states, and, as a form of contemporary research and extension practice, across agriculture more generally.

Australian agriculture currently faces an environmental imperative that requires industry-wide farm management change to deliver desired changes in natural resource management, with the national dairy industry’s Dairying For Tomorrow program being a prime example. This challenge can be met by better engaging land managers in industry and government-supported processes through increased usage of participatory techniques such as those applied within PPP and recommended by this thesis.

PPP blended action research with contemporary extension in a manner that circumvented the methods of the traditional Technology Transfer model. It did this by including all types of technology adopters (from laggards to innovators) and linking farmers directly to the research being conducted. With the agricultural agenda increasingly being led by an environmental imperative, the number and type of relevant stakeholders is becoming unprecedentedly large and exponentially more complex; Can it manage the required dialogue for determining satisfactory natural resource management outcomes?

Based on the NSW experiences of PPP, AL/AR appears a highly effective tool for bringing low profile participants into mainstream industry dialogues, as well as fostering collaboration amongst a wide range of stakeholders, even with those diverging interests. AL/AR could be applied to a greater extent across Australian
agriculture to the benefit of community sectors and society at large. In doing so, AL/AR, as a methodology and its related methods, could increasingly be fostered by extensionists and applied researchers, and their employing organisations. Some potential examples including the formation of mutually beneficial alliances and partnerships between traditional political foes, such as farmers and green groups, farmers with regulatory agencies, green groups and the corporate sector, the corporate sector with government, and industry and government to improve consultative processes for listening to, incorporating, and supporting farmers and all relevant stakeholders.

*The key to PPP’s success, like Landcare, has been to get serious about involving the people on the ground. Farmers are managers of extremely complex systems that are commonly known as farms, and as such are critical success factors of any RD&E effort supported by an RDC or any environmental agenda. By allowing professional space within RDC funded projects, and the ever-increasing number of environmental programs, for farmers to contribute to the RD and E agenda like any other stakeholder (eg scientists, agronomists, government, etc) the potential for overcoming the future challenges are boundless. (Innovate Australia 2003).*

8.3 Tertiary tier research implications

The use of AL/AR as a method of extension practice within PPP raised issues for research regarding the fundamental nature of extension. In recognising the context of predominant farmer absence from industry learning and research processes, this thesis has sought to shed light on the long-run historical pre-conditions that led to the origin of extension in western agriculture (Chapter 7). This research led the researcher to establish a clearer understanding as to why farmers are generally not directly involved in industry research and development, and this scenario was explained as being a consequence of the rise of the off-farm domain and its separation from traditional on-farm improvement activities.

Prior to this research on the origin of extension (Chapter 7) there appears to be no
clearly defined, widely understood or accepted record of the emergence of the phenomenon of extension. The concepts of the on- and off-farm domain are supported by historical evidence and can be appreciated as a framework for better understanding the discipline of extension. The value of the on- and off-farm framework is two-fold. Firstly, it begins to fill a gap in extension literature regarding its own origin and developmental history.

Secondly, without a clear and widely accepted understanding of the origin of extension and the historical determinants of its own characteristics, how can extension be expected to progress as a discipline? If extensionists do not know their own discipline’s past they cannot utilise their own collective history to inform current discussions and future directions. Without knowing what factors led to the origin of extension, what causal factors emerged to meet a need within western society that extension was able to supply, the discipline has a limited basis for justifying its existence within contemporary agricultural industries. The on- and off-farm framework provides a clear justification of the need for extension at its inception, presently, and in future. That is, if the conceptual framework of the on- and off-farm domain presented in this thesis are valid, then extension is a logical and necessary component that plays the key role of bringing the two sides together. With the increasingly technical and complex nature of scientific discovery and a swelling environmental imperative, there is arguably more than at any time in the past a greater need for extension to effectively bridge the widening gap between the on- and off-farm domains. The greater the gap that has evolved between the on- and off-farm domains the greater the need becomes for extension to play a critical role in affecting on-farm change to meet society’s requirements. Without acknowledging the origin of this gap it is impossible to construct arguments that it has indeed widened or that it even exists – without which the justification for extension as a community of practitioners and a principled discipline becomes tenuous.

There is a further benefit to extension of the on- and off-farm framework couched within a long-run historical record. Having this history at hand lends weight to the
credibility of extension as a discipline — one that has not just sprung up as recently as the mid-late 20\textsuperscript{th} century, but rather is in fact a phenomenon that has grown consistently since its inception on a major scale dating back to the 1500s. Without acknowledging its own roots, the extension community is selling itself short of an interesting, important and valid heritage. With this thesis as a starting point, it is hoped the extension community considers its own history and could perceivably apply the on- and off-farm framework to inform current and future theory, practice, and policy that constitute and govern extension.

The historical research presented in this thesis is not considered to be without errors, omissions, and the need for re-assessment over time; nor is it touted as a complete history of the origin and history of extension. Rather, it provides a first step within extension literature to developing a discipline that better understands its own past, and that utilises this knowledge to inform and improve its practice and position within the agricultural political landscape of western societies. It could be argued that the extension community has done society at large an injustice by not thoroughly exploring and publishing its own historical formation until now, particularly since tangible improvements to extension practice and consequent benefits to society can stem from this knowledge. These improvements and societal benefits can be realised if further contributions to the subject are proffered by the extension community, in the form of healthy debate and rigorous research, that inform an increasingly understood, accepted and accurate discourse of the origin and, importantly, the nature of extension and its evolution over time.

Research on the origin of extension has provided insights into the value of AL/AR as an effective extension tool. By relating the concepts of the on- and off-farm domains to PPP experience it was clear that PPP was effective in engaging stakeholders from both sides, through participation, in a successful forum that in turn generated mutually beneficial results. A key product of this dialogue was for industry stakeholders to recognise that participatory processes are extremely effective in providing farmers with a greater voice in agenda determination and
ownership of, and responsibility for, project results. Similarly, participatory approaches were shown to be effective in improving the ability and capacity of off-farm stakeholders to hear the on-farm voices of farmers.

The role of the state departments of agriculture in PPP, especially that of NSW Ag, were clear examples of how the AL/AR processes enabled both on- and off farm stakeholders to engage in collaborative agricultural development. The value of NSW Ag staff toPPP and its local implementation was clearly significant, and perhaps reflects the reality that good participatory processes require substantial investments in personal time and energy at an individual level. Interestingly, there were found to be differences between what role some government staff officers believed they were conducting (such as those identifying with a more technology driven approach) and what they were actually doing with farmers – which commonly involved the essential AL/AR elements of two-way communication as well as consideration of a farmer’s social context before much else was considered worth proceeding with on-farm.

Using participatory methods in PPP enabled better communication between members of the on- and off-farm domains. The effect of this was to give farmers a greater voice, and hence greater influence, in shaping their own industry’s learning and research agenda, while simultaneously providing scientists and other off-farm stakeholders with greater insight into the complex realities of the on-farm constraints facing farmers. Conversely, participatory forums enabled farmers to better appreciate the pressures under which off-farm stakeholders operate, be they political, administrative, financial, or scientific in nature.

**Personal reflections**

In light of my previously stated ethical and personal frame of reference (Chapter 3.6) my experience of PPP has led to the following final reflective comments. This first hand experience with qualitative research has convinced me of the validity and critical importance of qualitative investigation as a means for improving a scenario of interest – a view that may have been more slanted toward
quantitative analysis prior to PPP. This position represents a consolidation of my belief in the value of both quantitative and qualitative approaches to problem solving and situation improvement, but I now feel I have lived the experience of qualitative analysis to really know what it is all about. PPP has opened my eyes much wider than my previous partial realisation that social processes, such as professional extension, is one of few effective tools for enacting change within individuals, groups and rural society at large – which under the growing threat of increasing global climatic pressures appear to be more important than ever.

Having had connections to country people most of my life, I think the PPP experience has changed my general thought that many farmers are conservative and never particularly radical, especially when it comes to changing their own personal behaviour. Having witnessed much closer the challenges of dairy farming, and the veracity of farmers to improve the way they work for themselves, their family, their animals and their land, I feel I have been privileged to get close enough to realise that a farmer’s life requires a constant hand on the tiller to navigate through the complex and unstable maze of social, economic and environmental factors. For any outside audience, including myself prior to PPP, to discount this propensity for dealing with constant change as well as farmer’s willingness to embrace change under the right conditions, I feel can only reflect a lack of insight and observation from the outsider’s perspective.

Finally, I leave PPP with a sense of satisfaction that I endeavored to improve the lot of NSW dairy farmers – primarily by being the advocate of a project that promoted self directed learning and research, but also through its provision of resources that enabled participants to do so. As a result I hope that my perceptions of farmer benefits that stemmed from PPP involvement are a genuine example of actions that can reasonably be positively judged for having provided direct benefits to the researched and/or [having become] an advocate for them (Miles and Huberman 1994, p289).
8.4 Conclusion

Considering the experiment that PPP enacted within the NSW dairy industry, that of applying AL/AR methodology and methods to deliver farmer-driven learning and research outcomes, requires an assessment of the primary, secondary and tertiary tiers of research in their totality.

Overall PPP was successful in using AL/AR methods to instigate farmer activity to the point that farmers became the key determinants of their own learning and research agenda, as well as the main drivers of action within local group forums. The extent to which this occurred varied throughout the RDG network, although as a minimum achievement PPP oversaw farmer-driven activity in each region throughout NSW at some stage of PPP. This result contributes to the argument that AL/AR processes can indeed be effective for enacting farmer-driven research, and, has been justified by documented PPP related research activities such as the series of farmer conferences.

The AL/AR processes applied in PPP were more effective once they were redefined to suit the character and context of the farmers, stakeholders and the NSW dairy industry. These refinements of the AL/AR process are documented and justified in the body of this thesis but a deeper point about the nature of a method that can accommodate such change stands out. The element of the AL/AR methodology that emphasises the importance and relevance of working within a real world context enables the method to adapt on a contingency basis to the requirements, needs and wants of the participants. In addition to this, the component of AL/AR that promotes democratically delivered contributions by all participants effectively creates a path upon which negotiation and working consensus can be achieved. This has also been shown to be possible within PPP while simultaneously supporting the AL/AR tenet of group diversity.

The combined product of the core AL/AR components as revised and specified to meet the needs of agricultural contexts by the PPPLT provides an effective tool that is not limited to simply achieving tangible project outputs and socially
desirable outcomes amongst participants, but also one that is capable of recreating itself as circumstances, contexts, aims, goals, objectives and purposes change — a scenario that commonly seems to characterise contemporary agricultural project management and delivery.

The strength of AL/AR over other methods to deliver a flexible and contingency-based process for pursuing improvement lies in its core requirement for reflection within any AL/AR process as it unfolds. The work of Schön (1991) provided a useful distinction to inform the analysis of the PPPLT’s approach to delivering AL/AR in PPP. This is true to the extent that I believe the act of reflecting-in-action should not be ignored, or allowed to become subordinate to, the value of reflecting-on-action which provides a more readily documented but on its own, still incomplete account of reflective practices within AL/AR process.

Reflective activity is a consciously conducted and explicit exercise within AL/AR that perhaps most differentiates it from other approaches. The PPP experience demonstrated the value of reflecting at the state project management level and within RDGs by farmers, although again there are qualifications that have been suggested and discussed to increase the effectiveness of reflective behaviour: particularly, for example, to specify what level of activity is to be reflected upon such as personal or collective; whole group or sub-group; regional, state or national; and single project or multiple project reflection.

The process of reflection within AL/AR enabled the PPPLT to be innovative and still retain relevance to the context of the dairy industry, and, perhaps most successfully, enabled farmers to initiate learning and research agendas that were relevant to their daily farm management. These results are tangible learning research outcomes and can be expected to result from a well run AL/AR project. In addition to these, the reflective component of AL/AR enabled this research to pursue opportunities of meta-research regarding the nature and appropriateness of the AL/AR method itself and how best it could be tailored for application to agriculture, as well as facilitate the exploration of the history of extension within
western agricultural sectors.

From personal experience the reflective component of this research focused on the realisation that farmer participation with the NSW dairy industry was not high and that farmers were largely absent from the industry processes of research, development and extension that ultimately impact on their behaviour. By reflecting on this scenario this research pursued an explanation as to how such circumstances came to pass. This investigation led to the presentation of an historical narrative of the origin of extension that previously did not exist in a clearly defined form.

The presentation of the origin of extension has served to (at least partially) fill a perceived gap in the literature, but also to reinvigorate the fundamental justification for extension provision that is arguably under pressure to maintain current service levels. The prime justification for extension, that appears to have been lost from the daily delivery of industry-led extension practice, is that extension operates to serve a greater good beyond the farm gate and that it is essential for most efficiently creating a union between the on- and off-farm domains of agricultural development. Under growing political and environmental pressure for improved natural resource management (by the agricultural sector), the need for society’s — and hence the agricultural sector’s — policy makers to recognise and promote extension as an effective tool for delivering on-farm change is critical, and furthermore, within the extension sector itself, the AL/AR tool is of equal importance.
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