ANTHROPOLOGY AND MULTI-DISCIPLINARY AGRICULTURAL RESEARCH: UNDERSTANDING RURAL ADVISORY RELATIONSHIPS

Michael O'Kane

Abstract

As multidisciplinary research teams funded by governments and private industries become more common, new spaces are opening up for the application of anthropological techniques and disciplines within these teams. This means that new opportunities have arisen for the engagement and re-engagement of anthropological perspectives in both mainstream scientific research and in the application of knowledge beyond the academy. This article explores the role of anthropology in a multidisciplinary research effort, called Project 3030, involving innovative forage production processes in the south-east of Australia. It describes my positioning within the project as a 'social researcher', the role of social research during the life of the project, and how I sought to fulfil this role by using experience and training from the discipline of anthropology. The key focus of the discussion is on the relationships between the various participants and the ways in which the different types of expertise they brought to the project as a whole were expressed, albeit through often competing forms of discourse. In trying to make sense of this discursive juxtaposition, I sought a conceptual framework that would bridge the power disparities between the different types of discourse at play within the project, and the different types of expertise these discourses represented.

In early 2007 I became involved with a large, multidisciplinary research project in south-eastern Australia for the Australian dairy industry known as Project 3030. The project derived its name from initial agronomic modelling that suggested that farmers could increase their overall profit by thirty percent if they increased the amount of forage they grew on their farms by thirty percent. Prior to this, I had been working in northern and central Australia with remote area Indigenous communities and was brought in to add an anthropological dimension (skills in participant observation and applied anthropological field work) to the component of the research known as 'social research'. Although I had not encountered it in this context before, I learned that 'social research' is an umbrella term for any kind of analytical investigation within agricultural research that deals with the way the people interact with each other and the different aspects of the research. In this particular case, my task (along with PhD candidate and colleague Barbara King) was to study and analyse a type of engagement between farmers and certain rural service providers known as the 'advisory relationship'.

The advisory relationship

The advisory relationship refers to the relationship between extension professionals (including on-farm consultants and other rural service providers) and the farmers with whom they work. The Project 3030 research structure contained three key examples of the advisory relationship and these were bounded by a new research methodology called the 'partner farm' (Crawford et al 2007, O'Kane et al 2008). These partner farms represented a collaboration between the research project and three successful commercial farmers in order to hasten the process by which research results were developed into 'products' or 'research outcomes' for both the Australian Dairy Industry and its farmers. Briefly, these partner farmers implemented promising forage practices identified by the scientific research team and participated in monitoring, adapting and assessing their efficacy on a whole-of-farm systems basis. Each partner farmer was assisted by a regional development group consisting of a number of local farmers, service providers and extensionists from the Department of Primary Industries, Victoria. Importantly, the partner farm methodology dictated that the partner farms did more than simply try to emulate the results achieved by the research team at an individual farm level.

In order to affect a true partnership between the research and the commercial farms, learnings from the on-farm application of the research findings were fed back to the research team in order to inform the present and future direction of the ongoing scientific investigation. Thus, the partner farms were an important aspect of the research in which scientific information from the 3030 research met with agronomic perspectives, experiential bias and all of the complexities involved in operating a high functioning farm system.

Studying the advisory relationships that developed within these three partner farms for a period of just over three years, from January 2007 to the time of writing (February 2010), I was able to discern that they developed from season to season. I was also able to reflect on the different types of approaches to, and conditions of, farming in each of the three regions they were positioned – the north-eastern, south-eastern and Gippsland regions of Victoria, in south-eastern Australia.

Structural concerns

Given the close proximity of the lives and farms involved, the Project 3030 partner farm regional development groups formed close-knit groups. This made them quite productive as far as discussing decisions concerning farm management and the growing of feed (known as the feed-base), yet this same closeness made for very hard work anthropologically speaking. In early 2007, I entered each of these groups as the Project 3030 'social researcher' – a role that, at that time, members of the group and I was unfamiliar with. I had not long taken up the position and was still trying to make sense of how I might bring an anthropological perspective to a research project seeking to affect significant, industry-wide, practice change through action research. At the first meeting I was asked to introduce myself and explain what I was there to research. As I explained my role in the project, I could see that the farmers and service providers within the group were struggling with the concept of having someone in their midst who was trying to understand how they learned about and adapted to new technology, and how they created new ways of managing new technologies on their farms. For those present (including attendant 'hard science' based researchers) this was simply something that occurred out of sight and was of a much lesser order of importance than the technical aspects of the research project. However, as I was new to this field of inquiry, I had neither the social capital nor the type of language

at my disposal that would allow me to explain (or even really fully understand) my task adequately. These skills could only be acquired through spending time with the people involved in the contexts and arenas through which they moved.

I became aware that I had entered a battleground of competing discourses that privileged biological and agronomic approaches to farming over all others. Having grown up in rural Victoria, I had felt confident that I would easily relate to the language used by these dairy farmers to describe their farming practices and experiences. However, at that, and many subsequent meetings at each of the Project 3030 partner farms, I discovered that phrases such as 'more dry matter per hectare', 'mega joules of energy versus fibre content', 'leaf emergence stages' and 'litre per cow production' were the discursive currency in which information about dairy farms and farming were traded. As I got to know the members of each partner farm better, I realised that, in an era of drought and climate variability/change, farmers in South-Eastern Australia have had to become expert mangers to survive and will these days more often than not refer to their farms as 'farm systems'. Therefore, the privileging of agronomic and biological discourse over other discursive paradigms (such as natural resource management, environmental sustainability and nationally popular idealisations of rurality) that might also hold and transfer meaning of a different nature seemed unremarkable. Furthermore, in order to better understand which aspects of this Cartesian discourse had power in the different contexts I found myself in, I was obliged to cover multiple sites of inquiry that were geographically distant and were peopled by literally hundreds of informants. Moreover, these informants were grouped into structures representing, not only regional and local identities, but also different types and combinations of expertise that all contributed to the project.

As illustrated in figure 1, at the level of the project structure, there were seven major groupings of participants representing combinations of necessary expertise that were clustered around specific tasks and functions within the project. Again, in the interests of brevity and building a focus on issues of discourse, I can offer only a cursory description of each of these structural groups in order to enhance the present discussion.



Figure 1: Project 3030 structure.

Research trials, modelling and financial data

Starting from the bottom right hand circle of figure 1 and proceeding anti-clockwise, the research work carried out on trials, modelling (agronomic and biological) and the analysis of financial data from the trial work (systems profitability) was all done at a research facility known as Demo Dairy in the southwest of Victoria. This facility consisted of a working dairy farm that had been sectioned into different areas dedicated to dairy focussed research ranging from animal health to feedbase issues. On the particular section dedicated to Project 3030, two different types of feeding regimes (one focussed solely on a rye-grass base and the other consisting of a rye grass foundation heavily dependent upon growing alternative types of forage to sustain milk production) existed. Each system ran a herd of 36 milking cows and was monitored closely for qualities such as growth levels of dry matter per hectare, quality and consumption of feed grown per cow, and overall levels of milk production. While quite small, the results from these farmlets were then scaled up using modelling techniques in order to estimate their performance on a large commercial farm.

The objective of these two trial farmlets was to research and develop an intensive kind of feedbase system called complementary forage that promised to be able to consistently increase production levels and year-to-year profitability. In order to do this, two different systems, one traditional and the other experimental, were needed in order to compare and contrast results. Unsurprisingly, operating these two systems to the level of precision needed for this type of research required a great deal of time and labour. Accordingly, both the Victorian Department of Primary Industries (DPI) and the University of Melbourne employed people in full-time and part-time capacities to ensure the success of the trials. These people represented a wide-range of expertise and occupations such as farm hands, vets, farm managers, plant and animal scientists, agronomic modellers, rural financial consultants and extensionists who were all engaged in running these two contrasting systems with exacting precision.

Dairy Extension Centre

The Dairy Extension Centre (DEC) was a group of extensionists within the DPI who specialised in the provision of extension services to dairy farmers across Victoria. While the DEC operated within all dairy contexts - irrigated and non-irrigated land and high and low rainfall areas – Project 3030 was designed to consider only non-irrigated farm systems in the three main 'dry-land' dairy farming regions in Victoria. Consequently, even though the intent of the project design was to have a full and productive engagement with the DEC, this was in fact limited to those extensionists assigned to the project. This emphasis proved to have major ramifications for the ability of the project to make an impact on the industry as the DEC, a very influential group within the industry, was not identified by farmers and service providers as supporting the project and, thus, the project struggled to influence practice change in feedbase management as a direct result. Such a disconnect between the project and the DEC also had serious implications for the social research work as our focus was to support and enhance the advisory relationship between extensionists, consultants and farmers.

The lack of a means to establish productive relationships, beyond the four extensionists the social research team worked closely with, proved the cause of much confusion and conflict as the social research team was seen by the leadership of the DEC as, on the one hand, in competition with the DEC extension professionals over funding resources and the right to direct the project's extension strategy and, on the other hand, as being critical of traditional extension methods by dent of the fact that we were theorising new methods and models. This problem was exacerbated by the lack of common terminology and it was not until the last 18 months of the project that sufficient depth of shared experiences and history allowed for truly effective communication. Funnily enough, the experience mirrored my previous experiences in remote area indigenous communities – the main difference being that, in this situation, with English as everybody's first language, the gulf in communication was around the way we spoke about practice and practice change. Learning how to bridge this gap was to become a key outcome of the research and led the way to the development of a limited shared discourse concerning the research.

Project Management Group

The project management group (PMG) consisted of the principal scientists, extensionists and consultants (modellers and agronomists) involved in the project as well as the author and a PhD candidate (working with social network analysis – see King et al., 2009) as the social research team. For much of the life of the project, this body was the key decision-making structure within the project and met every two to three months to monitor progress and ensure that research milestones were being met on time and within budget. Additionally, the PMG made decisions concerning the direction of the research focus (what to plant, how to manage the farmlets, what aspects of the research to concentrate on at any given time, and how to collate the key learnings of the project for the greatest industry impact). During the course of these duties the PMG was also responsible for identifying any problems, existing or looming, within the project and formulating appropriate courses of action to alleviate these problems.

Unfortunately, because the members of the PMG were so grounded in agronomic and scientific discourse, they struggled to come to terms with the human dimensions of the project. For example, they often ignored or deflected criticism by farmers, extensionists and service providers that research goals at times seemed to have little applicability to 'real' farming contexts (such as farming in drought years and the realities of farming with limited time and labour resources). Furthermore, the prevalence and privileging of scientific discourse within the group meant that when the time came for making their results public, its messages to the rest of the project and the dairy industry in general were pitched well beyond the ability of all but the most formally educated farmers who were in a better position to understand them. This process served to confuse many within the dairy industry and heighten concerns of applicability. It also meant that the PMG increasingly looked to the social research team to

provide it with strategies to convey highly technical information effectively to populations of farmers and service providers.

The steering committee

The steering committee was made up of highly successful farmers, representatives of the peak industry funding body (dairy Australia) and key industry professionals. Its main function was to ensure that the research would translate into a benefit for the industry (either in terms of profit or stability) and that the research was being run efficiently and effectively. It was at this forum that much of the politics and conflicts at play within the higher echelons of the dairy industry were expressed to the leaders of the project in the questions and criticism of its direction and ultimate value. Although my access to steering group meetings was extremely limited, attendance at meetings proved fascinating as it was the arena within which the discourse of science met that of corporate business, and often clashed. Social research results were requested only three times during the research and, each time, the prevailing question was, 'how will we get value out from our investment in your work'? What was most frustrating about this was that, when an attempt to elucidate this 'value proposition' was made (which is really about (a) creating reflexivity in the project structure in order to generate shared meanings and a shared discourse throughout the project, and (b) providing an understanding of situated learning in a farming context that could be expressed in strategies for the creation of effective learning opportunities for farmers in both one-to-one and group situations) with regard to the terminology of anthropology and social theory. I was reprimanded for using 'jargon' and required to formulate complex ideas in a very simple language.

While in and of itself, this was quite a good exercise, the translation often oversimplified the message and I was constantly faced with remarks like 'so what' and 'that's obvious'. Conversely, the steering committee seemed to have a healthy respect for scientific terminology and much of the project reports consisted of either of the chief plant scientists discussing the scientific qualities of various species and cultivars of forage plants. Clearly, in this forum, scientific discourse was far more prestigious than that of social theory yet, like the PMG, the steering committee increasingly came to demand our input into the project to generate widespread uptake of a set of Project 3030 forage management principles and practices that had not yet crystallised. This delay was due to the lack of effective channels of communication

between groups within the project's structure and the development of an effective shared language within which to create consensus around project results.

Obviously, the social research team did not have the necessary technical background to analyse the results of the research and had, in any case, been engaged to enhance the ability of extensionists to perform this task. Accordingly, we determined to develop another group within the project structure within which to (a) create consensus concerning the key learnings and messages of the project and, (b) to package these messages in a discursive framework that allowed access to interested sections of the dairy industry from farmers, to consultants, to scientists. This group, supported by the social researchers instituted in the last 12 months of the research, became known as the technical coordinating committee (TCC). The TCC met every two to three months and consisted of the project's key extensionists, scientists and consultant, along with people external to the project such as high profile farmers and DEC representatives otherwise not involved in the research. It was in this group that the project began to achieve consensus around what were the important messages for the dairy industry stemming from the research and the principles and practices that needed to be applied on-farm in order to replicate the successes of the trial farmlets and partner farms. This was achieved through the interaction of the different types of expertise present within the project in forum that was dedicated to the identification of a set of robust, achievable forage options for dairy farmers. The creation of the arena for this interaction was motivated by the need within the project to find a shared voice and informed specifically by a combination of two theoretical approaches – the Interplay model (Gremmen 1993; Paine 1997; Kenny 2002) and the Communities of Practice approach (Wenger 1998; Wenger et al 2002; O'Kane 2008) discussed below.

Partner farms

The Project 3030 partner farms were characterised in each case by a very close relationship between the farmer, the on-farm consultant and the regional extension officer. The farmers, all agriculturists with generations of experience behind them, were very well respected in their areas for their ability to navigate the seasonal variations in rainfall successfully in order to produce large quantities of milk even in bad years. This level of respect within their respective communities was an important factor in the success of each regional development group as the partner farm methodology hinges to a great extent upon the extent to which the other farmers in the group perceive the partner farmer to be a 'good operator' who understands the implications of using the new technologies stemming from the research results and is capable of providing insights into how to evolve appropriate management practices for their use. In other words, the partner farmers must have the kind of solidity and social capital that comes only from a multi-generational background in farming and a currently successful farm enterprise. Thus, the Project 3030 were locally admired for their farm management skills and quite influential in their farming communities.

The on-farm consultants were also well known throughout the Victorian dairy farming community from their one-on-one consulting activities, as well as regular work with groups of farmers in both irrigated and non-irrigated dairy farming contexts. All three private consultants working within the project were very experienced ex-government employed rural extension officers who had gone into private practice. As such, they prized and traded on their reputations as being on the cutting edge of dairy farming technology and management practice – reputations which had been built up over decades. Consequently, membership of the discussion groups run by them were highly sought after by both farmers and rural service providers as it was considered to be a good way to fast-track farming practice change, gain access to both the latest technology, and benefit from the considerable local knowledge and experience held by the consultant led groups. Hence, like the partner farmers themselves, the three Project 3030 consultants exercised great influence in farming circles and their opinion held much sway.

Finally, the regional extension officers provided the groups with information concerning the productivity of the partner farm system, as well as the performance of the various new forage options and management practices introduced on-farm from the research trials. Extension officers, also known as 'Extensionists' are rural service providers who provide expert advice concerning the technical and management aspects of a wide-range of farming and farm related topics for each farming industry. In the case of dairy farming, some of the more common areas covered are the qualities and accepted management practices of various rye-grass species and cultivars, feed consumption and feeding regimes, pasture cover and stocking rates, cow health and medical problems such as mastitis and infection, milking technology, milk storage and breeding.

However, in this instance the role of the extension officers was the least well defined of any in the partner farm regional development groups, as they would normally lead discussions concerning new technologies and practice change. Consequently, as leadership functions became within the purview of the consultants, the extension officers found themselves in unfamiliar territory. Each extension officer reacted differently to the situation. In the Gippsland partner farm regional development group the extension officer adjusted by becoming an assistant to the consultant and providing the group with any information they requested or was deemed necessary by the consultant. In the south-west, the extension officer became a vocal part of the group and a confidant of the husband and wife who managed the partner farm and, in the north-east, the extension officer, a young man in his early twenties, became a protégé of the consultant (the most senior consultant involved in the project) and increasingly took on what could best be described as an 'understudy' role.

Clearly, owing to constraints of time and space, the necessarily brief description I have provided does not begin to portray the true complexities of the interplay between expertise, social capital, discourse and individuals that occurred during the three year period of study. I have purposefully kept the details as generic as possible in order to provide a tight context for a discussion of my role within the project while allowing for a description of how I sought, and eventually found, a common denominator to engage the different types of expertise and discourse within the project without becoming bogged down in the intricacies of field research.

Social research duties and the anthropological imagination

One of the differences between traditional anthropological investigation and the role of an industry funded 'social researcher' is that the research direction pursued must be initially formulated to be attractive to the particular industry in question and must then, once conducted, be packaged into a format that allows for the presentation of results as 'objectives met' or even as 'products'. In this respect, my engagement with Project 3030 and the Australian dairy industry was no different. From the outset of my research, I was given two main objectives to meet and was expected to develop a number of products from the research for the industry to use to become, ultimately, more profitable. Simply put, these objectives were to (a) to better understand how farmers adapt and use technologies with complex learning challenges to fit their specific intensive (non-irrigated) dairy farming situations and, (b) to identify principles for the design and evaluation of large development programs which can be used to support change within the industry. In meeting these objectives, I was also tasked with developing and describing a number of processes through which farmers might better understand and utilise the technological advances presented to them as a product of the industry's annual multi-million dollar investment in research, development and extension.

Project 3030 advisory tools

Briefly, the processes that became known as Project 3030 Advisory Tools, detailed elsewhere (O'Kane et al., 2008; O'Kane et al., 2009; O'Kane & Nettle 2009), are derived from a situated learning perspective (Brown, Collins & Dugiud 1989; Lave & Wenger 1991) which posits that learning is a social activity which occurs in a specific socio-cultural and temporal context. The design of the Project 3030 advisory tools was the culmination of three years research aimed at formulating an effective approach to meeting the learning challenges posed by the set of complex forage management principles and practices produced by Project 3030. The approach was grounded, first, in a comprehensive literature review and then in a detailed investigation of key decisions, decision-making processes, and decision-making times. We then utilised the Communities of Practice concept, the Interplay model and social network analysis to construct a series of successful learning opportunities within which participants in Project 3030 could address issues pertaining to adoption and fit-to-farm difficulties. This process was augmented by the use of social network analysis to understand the ways in which different levels of social capital held by participants could influence their efficacy in either passing information on or by blocking it from others (King et al., 2009). Finally, the approach was enhanced by a focus on risk and risk perception which allowed for a package of advisory tools centred on presenting farmers and advisors with an effective pathway for achieving practice change.

The package was designed to combine an effective one to one advisory strategy with the creation of dynamic learning groups focussed on forage management practices. In the first instance, the intention is for advisors to conduct a structured conversation in which farmers are taken through a four-step process. This was designed to allow the advisor an insight into farmer risk perception concerning feedbase management, and to identify whether or not individual farmers had the necessary management skill levels to contend with the more complex management practices required to gain benefit from Project 3030 principles. If the advisor felt the farmer was not ready or could gain more production through better rye grass management practices, that farmer would be directed to a more appropriate, less complex, way to address feedbase concerns. If the farmer is deemed ready by the advisor then he/she is directed to a Forage Practice Group (see figure 2) in which a discussion concerning Project 3030 forage management principles and practices are discussed and evolved. Again, the advisor whose role becomes one of resource provision and facilitation oversees this process.

In keeping with a foundational approach, the Communities of Practice (CoP) concept (Wenger 1998; Wenger et al., 2002) was employed to provide a framework within which to understand the different roles played by those participating in the partner farm groups. Wenger's concept was useful here because it could be used to imagine partner farm and regional development group members as being either in the core of the group (participating at a deep level in which decisions about farm management were made) or on the periphery of the group (informing the group via their experience, expertise and membership in other CoPs yet not involved in the decision making processes). Indeed, when I came to better understand and relate to the farmers and rural service providers participating in the project, Wenger's CoP concept was expanded (see figure 2) to included a third group of participants who were situated between the core and the periphery (O'Kane et al., 2008).

This new band of association was named the Participatory (or Engaged) group as it described the majority of regional development group members who were neither involved in making decisions concerning the partner farm nor playing a role which brought new information into the group from other networks. As such, the role they played was a filtering one in which information concerning the practice of forage production was considered in light of local knowledge and knowledge of local conditions. Such a process informed the decision makers at the core by producing a thoroughly contextualised discourse which was then employed to plan action. In turn the process was further enhanced by an understanding of the Interplay Model (Gremmen 1993; Paine 1997; Kenny 2002; O'Kane & Nettle 2009) of interaction in which the evolution of practice is sought through an understanding of the leading role played by rural advisors in the field. In the interplay model, the advisor operates as a mediating practice in which the areas of expertise held by the different social actors within a CoP are made accessible to the group through a process called 'joint performance'. It is this joint performance that generates an evolution of the practice at hand through the interplay of ideas.

3030 Forage Practice Group



Core (Invested)

 Main decision - making group with each farmer as the ultimate arbiter of decisions concerning his/ her farm system.

 Provides group with actual experience of utilising 3030 cf technology in a local context.

Participartory (Engaged)

 Predominately populated by interested local farmers who are interested but have not yet decided to use 3030 cf.

 Provides group with a wealth of local history, experience context within which to speculate about decision consequences.

Peripheral (Associated)

 Contains those participants who are engaged with but not in dairy farmers (Researchers, Seed reps, Ag company reps, Irregular attendees, etc).
Span boundaries between different groups and bring in new and novel knowledge for consideration by the group.

 Participants on the periphery link CoPs to each other and perform a networking function.

Figure 2: Adaptation of CoP concept for Project 3030 (O'Kane 2008)

In concert with the CoP concept and the Interplay Model, interviews and interactions with partner farm and regional development group members were also considered in light of Holub's reading of the Gramscian notion of the Intellectual. Holub (1992) interprets Gramsci's conceptualisations of the intellectual (traditional, organic and critical specialist) as being positioned across the ideological spectrum – from those working within the dominant paradigm to those opposed to it - within 'structures of feeling' (ibid: 155-160). These 'structures of feeling', while being impossible to quantify, produce a recognisable external form known as the 'intellectual community' (ibid: 162). Intellectual communities are held together by a common epistemological language perceived by Holub as a dialectic. It is through the use of these dialectics that intellectual communities maintain and share their identities, especially in relation to those like-minded persons who have solidified around other co-existent structures

of feeling.

Hence, as intellectuals, both researchers and farmers are subject to the wider flux and flow of ideas that exist in the various kinds of discourse that they come into contact with, both as individuals and as members of collectives. However, as politically active intellectuals, they are contesting the accepted wisdom of the dominant intellectual community and competing with other older and more established intellectual communities who, like them, are seeking primacy. The implication here is that, while intellectuals may create an environment in which change is encouraged, they may similarly create an environment that is stifled (ibid: 24). Accordingly, Holub refers to the way in which structures of feeling linking intellectual communities may be a conduit through which consent or dissent for the ideas of the dominant group may be marshalled.

The ideas and understandings canvassed above were further enhanced by the application of social network analysis (SNA) to the interactions of those participating in the networks created by the project. The SNA approach (see King et al., 2009), was applied by the Project 3030 social research PhD candidate and served to identify the key types of behaviours necessary for successful knowledge transfer within the dairy industry, from research to farm. Through the research into social networks conducted over the past three years, social networks have emerged as important spaces in industry based research, development and extension where information transfer may be either blocked or facilitated depending upon the strengths and types of the relationships within those networks. Social networks also impact greatly upon the ability of any research development and extension project to achieve impact within the industry and to deliver the full benefit of research to the farming community (for a full discussion, see King et al., 2009).

The other fundamental approach employed to develop the Project 3030 Advisory Tools was born of an engagement with Ulrich Beck's notion of risk and the risk society (1992, 1994, 1998). After the initial twelve months of the research had transpired, it became apparent that both farmers and the rural service providers involved in the project held nearly universally negative attitudes towards the agronomic and scientific information generated by the research team (as opposed to the social research team). When I enquired as to why this should be so, the majority of farmers indicated that they saw this new technology, and indeed any and every new technology, through the prism of risk. They had real concerns about the viability and profitability of the new practices need to utilise the technology and did not have enough information concerning what impact it would have on their farms or businesses. As such, it was clear that, until the question of risk was addressed, the project would have little impact on the day-to-day business of dairy farming in non-irrigated Victoria.

Beck's notion of 'risk society' was useful here as it is predicated on the assumption that society is preoccupied with a perceived level of risk created by human activity (O'Kane et al., 2009). These risks, in turn, are the cause of such anxiety because their origins are understood as being beyond the control of the human populations whose collective actions brought them into being and, as such, can only ever be managed, not eradicated (Beck 1998:12). This conceptual insight aligns well with the lived experience of farmers as they expend a vast amount of their time and energy assessing risk and attempting to create contingency plans for a host of possible events that may be thrust upon them at any moment. Consequently, while not written with the farming community in mind, Beck's words ring true in this context. Holling and Meffe (1996) lend support to this position in their article concerning the pathology of the 'command and control' ethos in all forms of natural resource management. They submit that the 'command and control' approach attempts to either prevent negative outcomes by controlling the processes that lead to these outcomes or by 'the amelioration of the problem after it occurs' (1996: 329). Furthermore, they see this as a generic default position (hence, pathological in nature) in which managers of natural resources seek first to command their environment in the face of risk. This perspective has much in common with Beck's. However, while Holling and Meffe (1996) are concerned with the way in which a narrow focus on 'command and control' can obscure whole system perspectives, Beck simply acknowledges the behaviour as a compelling reality and argues that modern social actors cannot be understood without recognition of the way in which risk impacts upon their everyday lived experience (O'Kane et al., 2009).

An intertwined perspective was used to form an understanding of risk in which the farmer's risk perception became the most important pathway or impediment to on-farm practice change through engaging in Project 3030 forage technology. However, in order for it to be effective there remained the problem of how advisors and farmers might generate an understanding of farmer risk perception given the traditional relationship of advisor/advisee in place in agricultural extension throughout Australia. This was addressed through the use of a framework for elucidating contrasting worldviews known as the Germinator method (Kenny 2002).

In its original form, the Germinator model works by looking at how the advisor constructs an opinion of the farmer, the farm system and the farm practice, thus constituting the advisor 'picture of how they believe the farmer sees the problem situation with which they are faced' (Kenny 2002: 159). This picture evolves from an understanding of 'three main elements – the farmer as a person – who they are – the farm system – what they do, and the farming practice – the interrelationship of who they, what they do and why they do it' (ibid: 160).

In Project 3030, an understanding of worldview in relation to forage production is predicated on an advisor being able to comprehend the way in which farmers perceive the capabilities and potentials of both their farms and their own levels of management proficiency. Furthermore, in order to determine both scale and scope, advisors must be able to grasp the farmers' vision of their situation while, at the same time, bringing their own expertise and experience at farm and farmer assessment to bear on any advice or suggested courses of action they may offer the farmer.



Germinator Risk Process

Figure 3: The Germinator risk process (O'Kane et al., 2009)

Figure 3 focuses specifically upon aspects feed base related risks rather than the more general approach contain in the original model. In this approach, the first panel represents the farmers understanding of the farm system in relation to the feed base, feed base management practices and the risk environment (feed budgeting, identifying and meeting the feed gap, etc). The third panel represents the advisor's understanding of appropriate practice given the potential, condition of the farm system, feed base and risk environment. The second panel represents the process of farmer engagement by which the advisor can build a realistic opinion of how the farmer is positioned in relation to his/her goals, risk perception and understanding of the farm system with particular emphasis on feed base issues. The fourth panel represents the new, grounded, understanding at the core of this discussion.

In order to follow the process outlined in the model above, it is necessary to engage with farmers around risk and the feed base effectively and efficiently. To this end, a four-step process was designed to clarify farmer positioning and provide the advisor/extension officer with a realistic understanding of farming practice. Again, this approach has been adapted from the original (Kenny 2002) for the purposes of understanding how risk perception affects farming practice in relation to matters concerning the feed base. The intention behind each of these four steps was to:

1. Determine the position of the farmer in relation to the farm system feed base.

2. Develop an understanding of the farmer's intentions with respect to the feed base.

3. Engage with the farmer around feed base practice.

4. Identify farmer risk perception in relation to the feed base.

(See O'Kane et al., 2009 for a detailed discussion)

Following this exercise, the advisor should be able to understand the farmer's perception of risk concerning the feed requirements of the herd sufficiently to enable the formulation of a management strategy supported by both the farmer and the advisor. The intention here is for the farmers to first employ the risk perception mapping exercise to determine whether or not Project 3030 forage technology would be beneficial to the farmer. If this is the case, the advisor then suggests involvement in the Project 3030 Forage Practice Groups (see figure 1) in order to implement the new technology on-farm.

Conclusions: anthropology and practice-based social research

It is important in concluding this discussion to point out the influence of an anthropological approach upon this research and its output. I feel compelled to highlight this aspect of the research, as with many multi-disciplinary research efforts, there is a danger of the work being represented as a kind of generic grab bag of ideas and concepts pasted together with no apparent method. In this case, it is precisely because an anthropological approach was so deeply embedded in the research methodology that it might not be readily recognisable.

To explain, in the first instance participant observation was the primary method of data collection with many days and nights spent 'in the field' (quite literally) talking to farmers, advisors and researchers. This led to an understanding of the rhythms of the seasonal cycle which dictates the when, where, how and what of decision-making concerning the production of forage and the management of farm feed-bases. The consequent understanding of existing decision-making processes provided an opportunity to imagine ways of assisting this process by the provision, not only of more precise technological information, but the experiences of veteran local farmers and service providers in concert with an evolving practice change focused discourse. It was the time spent in the field that allowed me to identify the CoP concept and notions of risk as key elements. This process occurred via an approach aimed at facilitating more successful learning opportunities for the time and resource strapped non-irrigated farmers of south-eastern Australia.

Intentionally anthropological in nature and (in conjunction with an ongoing social network analysis – see King et al., 2009) my work, as a result, produced a suite of advisory tools which took into account the ways in which the farmers and advisors involved approached the adoption of new technologies and the subsequent processes of practice change involved when engaging with new technology. Through three years of engagement with Project 3030 participants, the relationships and understandings that developed over that period have been used to develop a pathway to practice change which is dependent upon a continuing, and context rich, discourse about the practice of forage production.

References cited

- Beck U. 1992, Risk Society: Towards a New Modernity. London: Sage.
- Beck U. 1994, *Reflexive Modernisation: Politics, Tradition and Aesthetics in the Modern Social Order.* Cambridge: Polity Press in association with Blackwell Publishers.
- Beck U. 1998, 'Politics of Risk Society', in *The Politics of Risk* Society, edited by J Franklin (ed) (1998) Malden, Mass.: Polity Press, pp 9-22.
- Gremmen B. 1993, The Mystery of Practical Use of Scientific Knowledge. PhD Thesis, Wageningen University, The Netherlands.
- Holling C.S. and Meffe G. 1996, 'Command and Control and the Pathology of Natural Resource Management' in *Conservation Biology*, 10-2: 328-337.
- Holub, R. (1992) Antonio Gramsci: Beyond Marxism and Postmodernism. London: Routledge.
- Kenny S. 2002, A Process for Practice: Learning for Change in the Dairy Industry. MA Thesis, Institute of Land and Food Resources, The University of Melbourne.
- King Bj, Paine M.S, Beilin, R and O'Kane, M.P. 2009, Encounters with knowledge entrepreneurs and 'sticky' knowledge transfer: Case Study Project 3030 in *Extension Farming Systems Journal*, vol. 5, no. 1.
- O'Kane M.P, Paine M.S, and King B.J. 2008, 'Context, Participation and Discourse: The Role of the Communities of Practice Concept in Understanding Farmer Decision-Making', *Journal of Agricultural Education and Extension*, 14-3.
- O'Kane, MP and Nettle, R 2009 'Partner Farms in multidisciplinary research: The continuing evolution of a research and development methodology' in *Extension Farming Systems Journal*, vol. 5, no. 2.
- O'Kane, MP, King, B & O'Brien, G 2090 'Farmer risk perceptions and practice: Utilising notions of risk for extension in Project 3030' in *Extension Farming Systems*

Journal, vol. 5, no. 2.

Paine M.S. 1997, Doing It Together: Technology as Practice in the Dairy Sector. PhD Thesis, Wageningen University, The Netherlands.