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The Australian Rangeland Society

CHANGING COMMUNITY ATTITUDES

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ABSTRACT

Attitudes are a person's predisposition to an object or concept which results in a positive or negative evaluation of the object or concept. Research has shown that attitudes as such, are rarely a constraint to dealing with issues of land degradation and management and technology "adoption". Attempts to change attitudes are likely to be of little value. This paper argues the case for participative ecodesign as a means of conducting future rangeland research and development. To embark on this path it will be necessary for the rangeland science community to critically question traditions and myths which shape current practices. These include current conceptions of extension, "technolgy transfer", community and human communication. This will be a necessary precondition to the emergence of participative processes which reverse the history of subjection of grazier knowledge and values by institutionalised authority.

A set of values and guiding principles are proposed for participative ecodesign. These include (i) reinterpreting our relationship with land; (ii) policy development based on citizen as opposed to individual values and (iii) acknowledging power in the design process.

INTRODUCTION

The highlighted theme of the Seventh Biennial Conference of the Australian Rangeland Society was "the dynamic nature of rangelands and rangeland management". In the context of this invited paper, I felt it pertinent to explore whose attitudes were reflected in the decision to highlight this theme? Did it reflect the conference organisers' attitudes, those of the community of scientists and advisers we call rangeland researchers and extensionists, the community of pastoralists who occupy the rangelands, or the urban electoral majorities, who through the exercise of their democratic rights, now have the bulk of the political power?

The theme also focuses on dynamics - active change, but in which direction, for what purposes and in what form? When we speak of change do images of orderly and gradual change come to mind, much as we might have thought of evolutionary and successional change? Or do chaos theory and recent state and transition models of rangeland dynamics provide us with new models or metaphors of the change process? This raised the question of what was meant by "changing" in the title I was invited to address - were community attitudes dynamic in their own right and worthy of monitoring and measuring in the same way as ecological processes? Or was the attitude, inherent in this title, one that suggested community attitudes and values, at least in some sectors, were not dynamic, or changing in the "right" direction, and it was up to us, or someone, to attempt to change them?

My title also refers to "community" but in what sense? As I have used it above to indicate "a common professional interest" or "a body of people living in the same locality" or to indicate "a state of being shared or held in common"? Finally, it is worth considering whether the concept of attitude or attitudinal change, is in itself of any utility in our conversation about rangeland dynamics and change? These are questions which this paper explores in developing the case for a new ethos for rangeland research and development (R&D) based on a commitment to participative design which is sensitive to context and issues of power.

What Can Be Gained By Exploring Attitudes?

Attitudes are a person's relatively stable predispositions to an object (eg. rangeland burning) or an abstract concept (eg. the environment) which results in a positive or negative evaluation of that object (eg. rangeland burning is

hazardous given present laws). Attitudes are seen as a major determinant of an individual's orientation toward their social and physical environment including themselves. Mann (1969) identified three components of attitudes: (i) cognitive, consisting of an individual's perceptions, beliefs and stereotypes - often termed opinion; (ii) affective, a person's emotions or feelings toward the object and (iii) behavioural, or the tendency to act or react toward the object in certain ways.

Attitude Studies in Rural Areas

Some argue that attitudes held in the community affect the management of change. For example, attitudes held by participants in a community consultation process of the Murray-Darling Basin Commission (**Table 1**) have been described as "motivational forces" and seen as "very important for decision makers seeking to influence, anticipate or support change management behaviours" (Anon. 1991). In contrast, Vanclay (1992a) concluded that farmer attitudes were not a constraint to the adoption of soil conservation practices and that Australian farmers have high levels of stewardship and conservationism. In fact there appear to be no empirical studies which demonstrate that farmer or landholder attitudes are a constraint to dealing with land degradation in Australia (F. Vanclay pers. comm. 1992).

It is now often argued that knowing what people's attitudes are, may not help to explain or predict subsequent behaviour. Behaviour is determined not only by attitudes, but also by external factors in the immediate social situation - the context. Increasingly though, attitudes are seen as reflecting values, such that a particular value, or set of values may reflect a range or cluster of attitudes (Crouch and Payne 1983). Although values change they are seen as more constant over time than attitudes. Jamieson (1985) concluded that values were best synthesized around the notion of perception as "...people with different values may behave quite differently in the same situation because they will perceive it and organise its constituent elements in different ways". This is the same as saying that different individuals will "see" the same situation as different systems and will therefore perceive change and what constitutes an "improvement" differently.

Russell (1986) captures the implications of this when he states: `My real world is different than your real world and this must always be so. The common ground which is the basis of our ability to communicate with one another, comes about through the common processes of perceiving and conceptualizing. The processes may be the same but the end products are never the same. What we share is communication of the worlds we experience, we do not share a common experiential world.' Experience, as distinct from a "real world" out there independent of us as observers, is thus the basis of an individual's construction of the world in which s/he lives; we share meaning of these constructions through communication (Russell and Ison 1992).

As humans we have no way of referring to ourselves or to anything else outside of language. Since language, or what we more commonly refer to as communication, creates what we call reality, developing a 'shared meaning' (a notion created by the observer) will involve participation in the task at hand, of all those who will be affected by the outcome. Based on his neurobiological research, Maturana (1988) has defined human social systems as 'systems of co-ordinations of actions in language or networks of conversations'. He thus argues that a change in a human social system can only take place in the network of conversations that its members generate. From this perspective a community is seen as those people engaged in a network of conversations. This definition shapes a different metaphor for that of community than is now commonly perceived; it captures more elegantly the meaning associated with the word's roots in the Latin "communis", literally "with exchange".

Shaping new conversations

The theoretical foundations from which rangeland R&D policies and practices derive are in the midst of a paradigm shift; this is well illustrated by Ellis and Swift (1988) from their studies of African pastoral systems. They

acknowledge the social construction of range science and present the view that pastoral systems are non-equilibrial but persistent, with system dynamics affected more by abiotic than biotic variables as opposed to potentially stable (equilibrial) systems which become destabilized by overstocking and overgrazing. They conclude that "Our view of the world, or our perceptions of any system, has a great deal of influence on how we go about dealing with that system."

Rangelands as a term and as a science arose in a particular context. That context shaped current interpretations of the term today as well as shaping those practices which consensually are seen to fall within the ambit of range science. But as currently constructed the pastoralists are all too frequently left out; without the pastoralists in relation to their land there are no rangelands (Russell and Ison 1992). To date there has been a limited understanding of the relationship between Australian pastoralists and their environment; we have termed this their **context**. An individual's context includes their environment of actual history, the environment-to-come of anticipated goals as well as the environment of beliefs, values and mythology.

On this basis we (Russell and Ison 1992) have argued that much of what is done in science ignores its context; the case for a new R&D tradition which avoids being either objective or subjective - a science of relationships or second order R&D - is made . This paradigm has its origins in hermeneutics (the study of interpretation), phenomenology (the philosophical examination of the foundations of experience and action), and neurobiology (which provides an intellectual framework in which phenomena of interpretation arise as a necessary consequence of the structure of biological beings). These three intellectual streams have in common the questioning of our ability to objectify knowledge and thus see objects and events independent of the very act of observation. This framework makes it possible to explore the traditions in which contemporary rangeland science is embedded, and as a consequence, the network of presuppositions which shape the practices of those involved in rangeland R&D.

Deconstructing Australian Rangeland R&D Myths

Myths arise when ideas, models or theories relating to social or natural phenomena become sacred in traditional narrative or discourse[1] in ways beyond their original intention or scope. In the rangelands three powerful discourses which have shaped rangeland R&D practice and which appear to have reached mythical status are: (i) the "transfer of technology (TOT) paradigm; (ii) what "extension" has come to symbolise and (iii) the belief that institutionalised R&D has changed things for the better.

Transfer of Technology

There has been widespread criticism of the linear TOT model of agricultural R&D (Russell et al. 1989; Ison and Ampt 1992). A pivotal conceptual framework embodied in the TOT paradigm is the diffusion and adoption of innovations model of technology transfer. With its associated language (**Figure 1**), it shapes how extension is thought and talked about, especially amongst administrators from a research background. This model was developed in a particular context, and as so often seems to happen, educators, researchers and administrators have sought to employ it in contexts in which its assumptions no longer hold. This has been known for a long time, even in an Australian rangelands context (Crouch and Payne 1983), yet still it shapes peoples' perceptions of what extension is.

The TOT model has been shown to be based on a network of faulty assumptions and powerful and embedded metaphors. They are linked to misconceptions about what actually occurs in the process of human communication (Russell 1992; Russell and Ison 1992; Ison 1992). The dominant metaphors are those of "information transfer", "information revolution", "channels of communication", and "teaching" (Ison 1989) most of which arise from seeing communication in the same way as two computers might transfer data. These pervasive metaphors based on the electronic model of communication of course ignore "meaning making" which is a singularly human ability with a biological basis.

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There is a Need to Abandon "Extension"!

The word "extension" arose in the Universities of Oxford and Cambridge, meaning to "extend out from centres of learning". Extension and extension science further developed as a discourse in the Land Grant System of the USA. There and in Australia, it remains today captive of its original linear and elitist meaning. It is time to abandon the term and the network of jaded concepts at its core. It is probably too early yet to make claims as to what should replace it but alternatives are emerging under the rubric of action learning or research (eg. Webber *et al*. 1992) and second order R&D (Russell and Ison 1992).

Discourse and Power or Has Anything Changed in Over 100 Years of Institutionalised R&D?

In recent research we have explored the patterns of meaning and interpretation that have accompanied European settlement and the institutionalisation of technological innovation in the rangelands. Some of the questions we posed for this research included: (i) how were the rangelands interpreted by Europeans during exploration in terms of how they might be used/managed?; (ii) how had this conception changed up to the present day and what "problems" were identified?; (iii) what research was undertaken and what technologies were developed or recommended?; (iv) what innovations were reported which appeared unrelated to institutional activity? and (v) what were the stated outcomes of the research undertaken?

The research was conducted from the perspective of the French philosopher/historian, Michel Foucault (Rabinow 1986), who has examined power as a phenomenon evident in all relations. Thus power knits people, institutions, technologies, animals, plants and land together via legal constraints, administrative arrangements, economic factors, scientific discourses[1] , inherited or traditional habits, methods, beliefs and techniques. The material effects of technologies never act in isolation: they are always bound up in networks of relations which embed both "subjects" - the people who use techniques/tools/machines - and "objects" - whatever is acted on, worked on referred to or brought into use by technology - in relations of power (Mackenzie 1992).

Mackenzie (1992) identified four main technological lineages relating to institutional involvement in pastoralism; (i) survey/surveillance technologies; (ii) boundary technologies; (iii) pasture technologies and (iv) technologies of animal control/production. In respect of the survey lineage it was found that: "The continuity at work in the technological lineage of the survey, whether carried out through theodolite or satellite, consists in the fact that objectification of the land and the subjection of the grazier are consistently intertwined throughout the succession of discourses..." The focus has moved from seeing the Western Division as a drought prone grazing area ravaged by inappropriate settlement policies at the turn of the century to a "rangeland ecosystem" which is the self-evident focus of scientific research. If anything, the subjection of the grazier has intensified as they are now seen as just another element in the ecosystem to be regulated from the centralised vantage point of a comprehensive understanding of the ecosystem.

Just as many have believed that a return to a climax vegetation state was desirable and achievable, there has existed a myth that pioneers moved into the interior and recklessly cleared everything until only open pastures remained. This view was supported by Suzuki (1991) in his foreword to "Taming the Great South Land " (Lines 1991); it took the form of apportioning blame

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[1] *Foucault used the term discursive formation in referring to the overall structure tying together discourse, (a systematically ordered set of statements, often scientific, but not necessarily so, centred on a particular object or objective), institution and technologies/practices. Discursive formations, in their construction of an object of investigation and regulation, operate as apparatuses of power.*

and responsibility to earlier generations. It did so without consideration of the context of those times and of the prevailing discourses. It ignored the fact that early arrivals were not just settlers but also travellers and explorers and this implies limits to their destructiveness. The use of the survey allowed, however, the appropriation of land by central authority and gave rise to relations of power about how that land should be used and managed. This is well illustrated in Bowen's (1987) biography of Kidman in a description of a debate in the South Australian Parliament in 1916 - the then Minister of Industry stated: "Before Mr Kidman came in, there was a greater number of cattle and sheep in South Australia. He must stock the land and use it properly or give it up" (Bowen 1987 p.234)

So what has changed? The drought of the early 1890's changed the way the Western Division was viewed and led ultimately to the 1901 Royal Commission. At this time Henry Lawson (1890) wrote in his poem "Bourke":

"No sign that grass ever grew in scrubs that blazed beneath the sun;
The plains were dust in Ninety-two, and hard as bricks in Ninety-one.
On glaring iron-roofs of Bourke the scorching, blinding sandstorms blew,
No hint of beauty lingered there in Ninety-one and Ninety-two.

One hundred years later the headlines exclaim:

"Dirt poor. You think you have heard it all before .... about how Australia,s farmers are suffering. But not on this scale, not in this way. The vast plains of our state's west have become a disaster area - for both people and their properties. Hopes and dreams are being eroded, just as surely as the land itself." (Wahlquist 1992).

McKenzie's (1992) research reveals that in terms of power relations either nothing has changed at all or the place of the pastoralist in that discourse has become worse. His analysis also reveals how institutionalised R&D, by failing to value local knowledge and experience in a genuine partnership, has constrained innovation and beneficial change. For example grazier innovations (eg. rabbit viruses) were initially actively discouraged by institutionalised authority; some were later appropriated by R&D organisations (eg. use of goats for woody weed control, fibre and meat).

There are, however, positive developments, but each is at a very fragile stage. For example there is much talk currently in R&D circles of the need to move to "group extension"; the very phrase is a cause for concern and ignores the essence of participative research. The Rangecare/total catchment management (TCM) movements are seen by many as the great hope for community based ecologically sustainable development.

Rangecare - the great hope for ecologically sustainable development

There is no doubt that attitudes among the farming community have changed dramatically in the last decade as illustrated by the widespread formation of local Landcare groups (Commonwealth of Australia 1991; Woodhill 1990, 1991; Hollick 1990; 1992abc), but, as argued above, attitude change is unlikely to be enough. Many groups are inactive, racked by conflict or disempowered by institutionalised knowledge and action. From our own and related research in the Western Division it has become apparent that the greatest threat facing Landcare/Rangecare is appropriation of local initiative and enthusiasm for institutional purposes. There appear to be a complex of factors giving rise to this situation: (i) lack of an appropriate theoretical framework from which to do "extension" (Russell et al. 1989); (ii) crises of confidence and lack of clarity as to who the real clients of state based service organisations are (see Holm 1990); (iii) lack of professional support and development particularly in terms of group and interpersonal skills (this includes language usage and limited attention to active listening); (iv) limited valuing of local experience and knowledge and existing grazier networks; (v) real and perceived threats to self esteem in moving from a deliverer of technology to a facilitator of local initiative; (vi) preoccupation with funds acquisition and negotiating the associated bureaucratic processes (which further empower service personnel and disempower local people); (vi)

inappropriate reward systems for service personnel; the system generally rewards institutional maintenance and advancement at the expense of client service and career advancement is often related to success in appropriating both resources and kudos for institutional maintenance, expansion or promotion and (vii) there has often been a focus on the plan (the product) rather than the planning (the process).

The end result is a R&D system which can be viewed as a network of system determined problems (Ison 1992) with each institution or sometimes an organisational programme or arm determining or formulating problems in isolation from its external environment. Put another way, these institutions act as if they were closed systems (Holt and Schoorl 1990) and little to no attention is paid to the quality and nature of the relationship between the system and its environment. In the context of integrated catchment management this has led Hollick (1992a) to advocate (i) the use of a variety of design instruments, balancing their strengths and weaknesses and which are sensitive to the needs, aspirations and concerns of the farming community; (ii) cooperation based on shared understanding and appropriate incentives rather than statutory controls and (iii) farming community involvement in developing statutory controls where these are necessary.

The alternative to system determined problems is problem determined systems (Ison 1992). The challenge is to create processes and institutions which give rise to problem determined systems. Almost a century after the 1901 Royal Commission there is a need for change which makes a difference. We can no longer afford more of the same. Participative ecodesign provides one way of developing problem-determined systems.

Participative ecodesign

Despite the growing body of world-wide experience to the contrary there persists the view that one person or nation can change or develop the other - to be responsible for them (see Mares 1992). It remains all too easy to fall into the old cliches - we need to change attitudes - and to set ourselves (the experts and scientists) up as if pastoralists or our clients were marionettes requiring skilfull manipulation. It is also too easy to think that there are short-cuts and that local constraints and contexts can be by-passed (Manger 1990). So how can we move away from action based on the cliches and embedded metaphors?

Maturana (1988) recognised two ways to trigger change in human social systems; both require experiences outside the network of conversations that constitutes any particular human social system: (i) through encountering others in a network of conversations that are not confirming as when encountering foreigners or when moving beyond the normal ranges of a community; and (ii) through interactions that trigger in us reflections upon our circumstances of coexistence with other human beings.

These two possibilities provide a framework for what I am calling ecodesign. Design can be characterized as an involvement in a project that has many players and that translates human culture, technology and aspiration into form (Coyne and Snodgrass 1991). My focus on design is in response to Hooker's (1991) observation that: "The direct consequence of the profound changes in the character and role of organised knowledge is that the future must now be regarded as increasingly a human artifact - an art-in-fact. The future can no longer be regarded as a natural object, a fact already there or objectively determined by present trends. Rather it must be chosen. Artifacts are the realisation of human value judgements in facts, in the concrete design of our world. Artifacts are experiments, experiments first with what is possible and then what is preferable. They are designs, chosen from among possible designs, because of the values they realise in the designs." He proposes a process of futures design based on "backcasting" rather than extrapolation or projection from the present (Figure 2).

The challenge, therefore, is for those who through their being (i.e. who and where they are) constitute what we recognise as the rangelands, to formulate future projects for the purpose of designing one or more forms for a future

rangelands. Ecodesign is specifically concerned with bringing ecological principals and values (see Russell 1991; Walters and Holling 1990) to bear on the design process. Future professional roles are thus likely to involve responding to and extending invitations for problem or opportunity formulation as members of co-researching teams, joint identification and evaluation of alternatives, designing and facilitating group processes and co-managing and evaluation of plans and programmes.

Appropriate values for design must be articulated and developed. What are some possible values? I do not wish to be prescriptive but I outline three value positions which I invite you to consider in the design of future rangelands.
Reinterpreting Our Relationship With Land

Many scientists and urban dwellers have limited understanding of Australian pastoralist's relationship to land and its associated vegetation. Their understanding and interpretation (eg. Kerston and Ison 1993) is something they have to contribute to participative ecodesign. Perception and interpretation of land and the nature of change of land, and its associated vegetation, are important issues for future R&D.

We also have a rich tradition to draw on in aboriginal culture (eg. Chatwin 1987). A set of values with the potential to shape future design can be found in four transcendant rules interpreted from the Yarralin aboriginal community by the ethnographer, Deborah Bird Rose (cited in Knudtson and Suzuki 1992):

(i)   Balance - a system cannot be life enhancing if it is out of kilter, and each part shares in the responsibility of sustaining itself and balancing others.
(ii)   Response - communication is reciprocal. There is here a moral obligation : to learn to understand, to pay attention, and to respond.
(iii)   Symmetry - in opposing and balancing each other, parts must be equivalent because the purpose is not to "win" or to dominate, but to block thereby producing further balance.
(iv)   Autonomy: no species, no group, or country is "boss" for another; each adheres to its own Law. Authority and dependence are necessary within parts, but not between parts.

Citizen Values Not Individual Preferences

Sagoff (1988) makes the important distinction between the individual as citizen and consumer and argues that as a citizen an individual is concerned with the good of the community rather than with self interest which is expressed in the individual's role as a consumer. His major thesis is that social regulation should reflect the community regarding values that are expressed by participation, particularly in the political process (which may operate locally, regionally or nationally), and not simply or primarily through the self regarding preferences individuals seek to satisfy in markets. Survey procedures have been developed to elicit citizen values regarding environmental management. It is argued that such surveys offer greater scope to assist policy formulation than the "intense opinions of organized groups and the quantified costs and benefits of net benefit analysis" because they "tell us how citizens believe they ought to behave" (Beatty 1991).

Naming Power in the Design Process

John Heron (1989) developed a model which identified three levels of power to be consciously recognised in the process of project or activity design: (i) Hierarchical, with "power over" leading to "deciding for"; (ii) Cooperative, or "power with" leading to "deciding with" and (iii) Autonomous, or "power to" leading to "delegating deciding to".

Whilst not consciously using Heron's model, it nonetheless encompasses principles which have guided the design of research conducted in the NSW rangelands by the CARR (Community Approach to Research in the Rangelands) team (Webber et al. 1992ab; Russell and Ison 1992). In our initial dialogue with pastoralists about developing new approaches to R&D distinctions were made between (i) research on things, such as plants, soil etc; (ii) research on

people and (iii) research **with** people. Pastoralists found these distinctions meaningful. They were intrigued by our interest in researching with people, particularly as their previous experience of research and researchers was mainly one of researchers taking and seeming to give nothing back in return.

Pastoralists responded to our invitation to join together to research issues they nominated; this has resulted in us working with a small group of pastoralists over the last two years on the issue of marketing of middle micron wool. One of the major outcomes of this research has been a set of process design principles which we believe have some general utility for the design of participative R&D.

Some guiding design principles for participative research in the rangelands

* Projects have the potential for more mutually satisfying outcomes when an invitation is extended to participate and the resultant communication is based on conversations which acknowledge each person's experience as unique and valid;
* It is important to understand that experience and knowledge is related to context and that it is necessary to attempt to appreciate particular contexts;
* Enthusiasm, which may be triggered, appears to be an emotional state predisposing individuals to action which is meaningful to that individual;
* Matters individuals are keen to take action on may or may not concur with institutional priorities;
* Pursuit of these matters in open, collaborative and critically informed ways can lead to locally meaningful and adaptive changes;
* Knowledge is both individually and socially constructed and because of this, processes are necessary to create learning networks;
* Pastoralist families and communities already do "research" and "extension" (share experience and knowledge - but they place importance on waiting to be asked);
* diversity of experience, knowledge, research and "extension" action is an asset of equal importance to the diversity of the biophysical environment.

CONCLUSIONS

The question we might ask of the rangelands in the future is: "Is that how it really is?". The answer will be in the interpretation and in the dialogue that ensues. The challenge for future R&D practice will be to design processes that allow, through dialogue, for the range of interpretations to be brought forth. The worlds of the graziers and those of the scientists may remain as in the case of Fortmann (1989) as stories which do not intersect. Each is a mystery to the other and where there is mystery then the possibilities of design are removed from effective dialogue. Random dialogue is not enough - the potentialities of mutually satisfying conversation is itself a process for design - who is to be involved in the issuing of invitations and who is to be the recipient of them? Gender and ageism, or its reverse, become critical in this context - decision making and thus agreement about what is desirable change has for too long in rural Australia suffered from the lack of full and open participation by women. We also run the risk of constantly making decisions which are generationally skewed as those in positions of power draw on experiences which are past and no longer relevant to the experiences of the present. These are all difficult questions but once acknowledged they may help to shape the design process in ways that lead to altered or enhanced perceptions and to changed emotions. - this is more likey to lead to meaningful action than relying only on attempts to change attitudes, objective science and logic.

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Table 1.   Attitudinal positions held by participants in community
            consultation processes conducted by the Murray-Darling
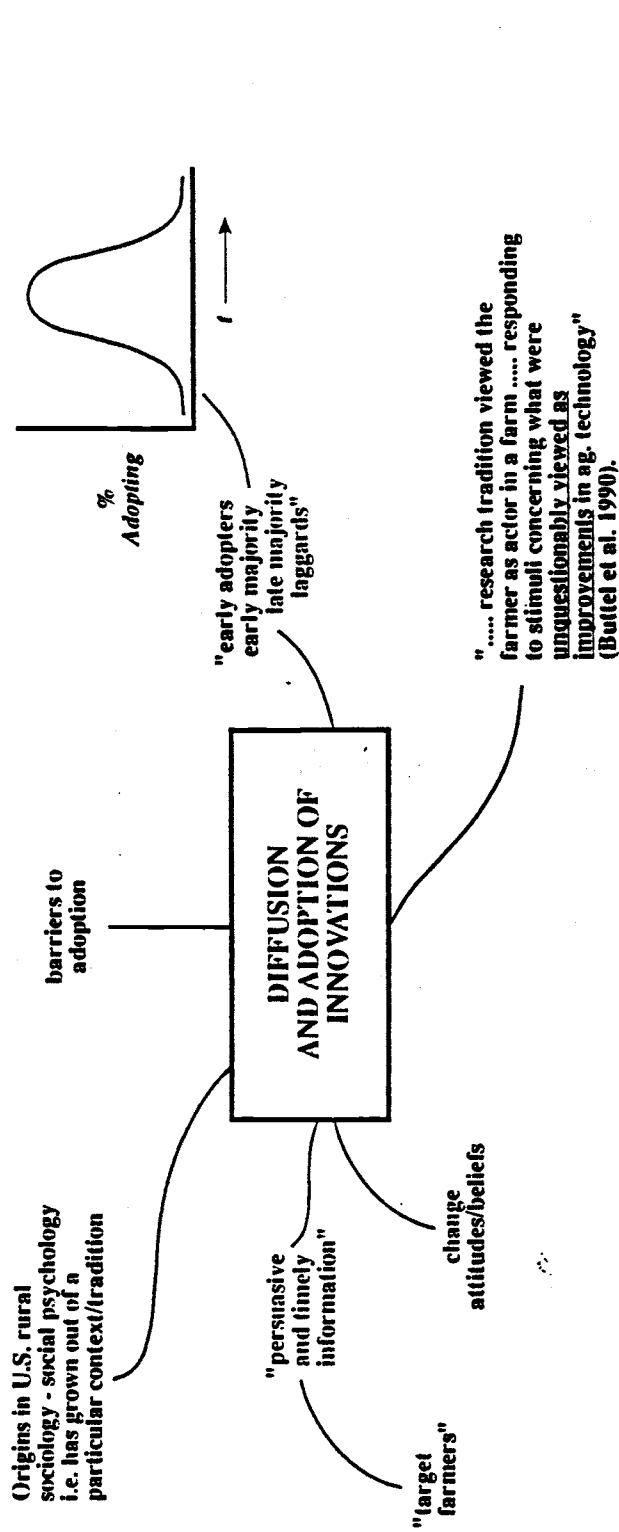   Ministerial Council (Source: Anon. 1991)

a) Most significant attitudes:

    * avoidance of further regulation
    * support for the family unit enterprise
    * encouragement and self-determination

b) Other attitudes:

    * the family farming unit is being undermined;
    * natural resources infrastructure should be a cost to the nation as
      the nation shares the benefits;
    * on-farm decisions are being constrained by increased regulation;
    * farmers are good conservationists by definition;
    * governments join partnerships they can dominate and control;
    * research knowledge is secondary in value to experience;
    * many environmentalist's statements are ignorant of production
     processes;
    * many farmers are unaware of the long-term damage they are causing to
      the environment;
    * farmers are unemployable outside farming;
    * big business gets assistance to survive that is not available to
      smaller enterprises;
    * existing environmental control regulations are not policed or
      enforced
    * up-river has little regard for down-river
    * down-river refuses to understand up-river
    * environmentally sound enterprise management practices are expensive
      and threaten the survival of the initiating manager
    * incentives not punishments will lead to effective change in
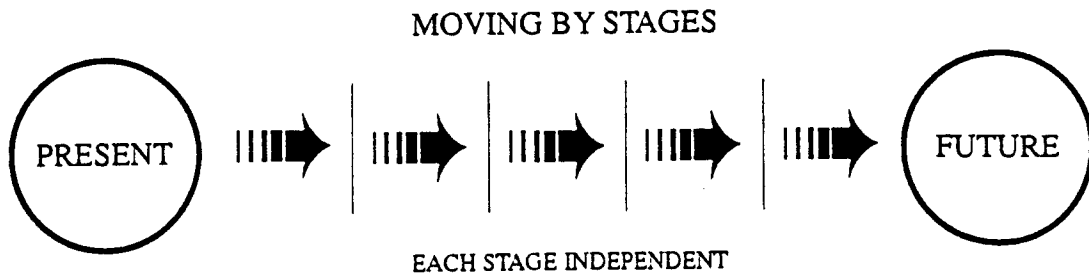   management behaviours.

NOW LARGELY IRRELEVANT IN THE RANGELANDS?

OR

% Adopting

t →

"early adopters
early majority
late majority
laggards"

"..... research tradition viewed the
farmer as actor in a farm ..... responding
to stimuli concerning what were
unquestionably viewed as
improvements in ag. technology"
(Buttel et al. 1990).

Origins in U.S. rural
sociology - social psychology
i.e. has grown out of a
particular context/tradition

barriers to
adoption

**DIFFUSION
AND ADOPTION OF
INNOVATIONS**

change
attitudes/beliefs

"persuasive
and timely
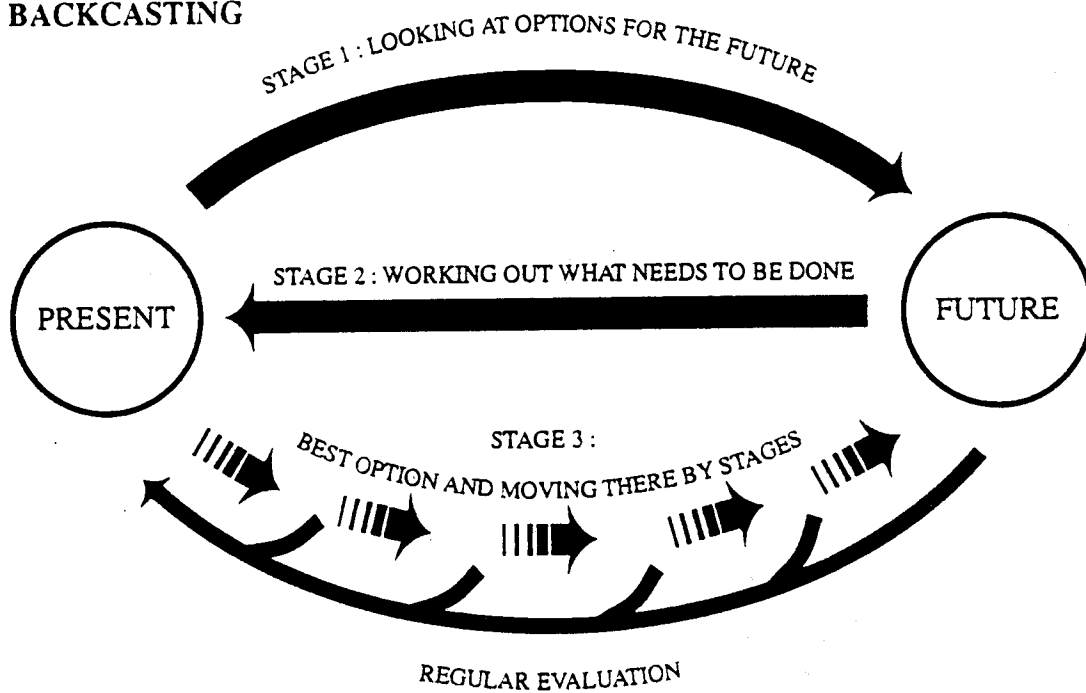information"

"target
farmers"

(i) *promoted technology BUT
was it socially useful?*
(ii) *focused on commercial innovations
- what about conservation or environmental
innovations?*

Figure 1. The language associated with the diffusion and adoption of innovations model of technology transfer
and some of its questionable assumptions for rangeland R&D.

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FORECASTING

MOVING BY STAGES

PRESENT |||➤ ||➤ ||➤ |||➤ |||➤ FUTURE

EACH STAGE INDEPENDENT

BACKCASTING

STAGE 1 : LOOKING AT OPTIONS FOR THE FUTURE

PRESENT

STAGE 2 : WORKING OUT WHAT NEEDS TO BE DONE

FUTURE

STAGE 3 :
BEST OPTION AND MOVING THERE BY STAGES

REGULAR EVALUATION

Figure 2. Current planning is characterised by forecasting whereas a move to backcasting is advocated for participative ecodesign (Source: after Hooker 1992).

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