

# A paradigm for persistence: a vital challenge for the agricultural academy<sup>†</sup>

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The further economic development of modern, multi-functional and responsible agricultural and food systems must be set within a global context of ecological sustainability and social responsibility. This presents all of those who are concerned with such development, with a much more complex challenge than that posed by the relatively straightforward goals of the Green Revolution to increase production of staple grains in the pursuit of food security on a national scale. It is thus crucial that leaders within institutions of research and higher education in agriculture and related disciplines across the entire world come to terms with the intellectual, moral, practical and political challenges that are fundamental to this systemic change of focus. The situation demands nothing less than a paradigmatic revolution in education, research and extension with implications for the adoption of a very different strategic role for universities with respect to how they critically engage with the multi-stakeholders of entire agri-food systems.

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## Introduction

Agricultural colleges and university faculties of agriculture in many places across the world are somewhat atypical of other institutions of higher

education in their commitment to direct service to their communities. This essential public service focus has been inspired particularly by the Land Grant Colleges in the USA that were established, almost 150 years ago, explicitly as agents of social and economic development (Schuh, 1984). The initial emphasis of these institutions was on the education of a previously uneducated citizenry, thereby harnessing science and scientific technologies to farming and to other practical rural activities. By the early part of the 20th century Acts had been passed by the US Congress to formally incorporate both research and extension/outreach as two other objectives that were central to the missions of these institutions. In stark contrast to the medieval universities of Europe as well as to the contemporary Ivy League universities in America itself, the Land Grant Colleges came to develop themselves as socially networked institutions that

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were firmly and directly connected to the citizens through a variety of formal and informal social networks with a particular concern for the inclusion of those individuals who historically had been without social influence, as well as of those communities which, to that point, had been 'left behind' (Fear *et al.*, 2006).

While commitment to the tripartite mission of teaching, research and extension is still held passionately by many within the Land Grant system, there is a growing perception in the US, both within and beyond the academy that this is currently under significant threat, if not already in severe decline in actual practice. As some see it, the Land Grant colleges especially, have 'lost their way' (Schuh, 1984) and need to 'reinvent themselves' (Sinnott & Johnson, 1996), and 'return to their roots' under circumstances where they are seen, by some at least, to be both 'out of touch and out of date' (Kellogg Commission, 1999). There are calls for academia to 'renegotiate its social contract with the people' (McDowell, 2001) and for universities to assume a mission that is 'development oriented' (Bawden *et al.*, 1991). In counterpoint, there is an increasing clamour in support of the need for all American universities, Land Grant Colleges included, to become more vigorously engaged with the issues of the day. As the late Ernest Boyer submitted just prior to his untimely death: '[t]he academy must become a more vigorous partner in the search for answers to our most pressing social, civic, economic and moral problems' (Boyer, 1999) and to do this he argued, it must focus its attention anew, on what he referred to as 'its historic commitment to the scholarship of engagement'. To accept these challenges however, will entail profound changes in institutional strategies that will have marked impacts on research methodologies and agendas, as well as teaching pedagogies and approaches to extension and outreach. It will also entail profound changes in academic cultures, in the self-image of academics, and in the very role that universities currently play in societies across the globe.

## Engagement

The call for engagement has particular relevance to those concerned with the 21st century challenges to sustainable agri-food systems, with the need to

embrace a myriad of pressing ecological, social, political, economic, cultural and technological issues. Such is the urgency of these challenges moreover, that there can no longer be any debate about whether or not agricultural universities should increase their commitment to the scholarship and practices of engagement, for that is indeed a moral imperative: the real question is 'how can they do it better?'. To follow an argument by Bok (1990), it's not whether universities need to concern themselves with the pressing issues of the day but whether they are 'discharging this responsibility as well as they should'.

There is much to suggest that there is considerable room for improvement in this matter in agricultural universities across the entire world, including within the USA itself. The issue is not just a matter of doing more of the traditional things in the name of public service, but of doing many new things within the often contestable contexts of sustainability and sustainable development in a manner that essentially involves public judgment. With the interplay of issues reaching increasing levels of systemic complexity on truly global proportions, the need for judgments about what is done in the name of engagement for improvement, are both necessary and intellectually and practically challenging. The implication is for nothing less than a shift away from the prevailing paradigm of 'productionism' that has so dominated research and educational approaches to agricultural and rural development for so many decades in support of the much greater complexity, contingency and ambiguity of a paradigm of 'sustainability' that demands new ways of collective thinking and making judgments as well as new and inclusive ways of acting to achieve and evaluate development improvements.

The pressing issues associated with concerns about the sustainability of agri-food systems are issues that effectively concern every person on earth in one manner or another, be they matters of food security, food safety, ecological integrity, ecosystem services, landscape, social equity or cultural sensitivity. For this reason alone, all citizens on earth deserve to be as significantly involved in judgments about future developments in agriculture as possible, in ways that historically they have not been. Under these circumstances of participation and deliberation, the need is for the

academy to engage *with* the citizenry and not just work *for* it or *on* it or extend out *to* it (Fear *et al.*, 2006). This is a very important distinction and indeed should be central to what might be seen as a new era in the development of agricultural, and specifically of agri-food systems – an Era of Persistence which provides the perspective for a paradigm of sustainabilism while transcending the boundaries of concern of the preceding Eras of Production and of Productivity (Bawden, 1997).

A commitment to a *paradigm of sustainabilism* does not mean the absolute rejection of technoscientific efforts to continue to improve the production of particular agricultural commodities or the productivity of farming and other agricultural enterprises: rather it is to provide a much more comprehensive, systemic context for those endeavours and it thus demands close inter-connections with them. The reverse situation is even more important, for the fact of the matter is that in the absence of primary concerns for issues beyond production and productivity, endeavours in agricultural development over recent decades have been marked by a host of undesirable if unintended consequences – social as well as ecological. These negative impacts have not only threatened further improvements in yields and in enterprise efficiencies, but have posed potential risks to the future integrity of entire ‘ecosystems’, to the continuing supply of natural resources, and to the coherence and well-being of communities in rural areas and beyond.

## Paradigms and change

It is a great pity that the precise meaning of the word paradigm has been so corrupted and distorted through such casual overuse in scientific discourse as well as in everyday language, for the central 21st century challenge to sustainable agri-food systems is undoubtedly paradigmatic in its nature. Thomas Kuhn, the philosopher of science, who was the first to really call attention to the precise significance of paradigms in science and in the ‘progress’ of scientific endeavours, defined them as ‘entire constellations of beliefs, values, techniques and so on, [that are] shared by a given community’

(Kuhn, 1962). Paradigms are the intellectual and moral frameworks or world views through which we collectively come to view the world about us and to do what we do in it and to it in the name of improvements or developments. Such is the influence of the paradigms to which each of us subscribes, that our everyday actions as individuals and social groupings alike, are, to a very large degree, practical expressions of our intellectual and moral beliefs and assumptions: if what we do in this world is a function of the way that we see it, then it follows then that if we want (or need) to do things differently as communities we need to change the way that we collectively view the world. Thus we need not just to adjust our individual world views but together shift our collective paradigms – yet as Kuhn insists, this is by no means a simple task that in fact demands little less than a total intellectual and moral revolution. Such a paradigmatic revolution is indeed the central challenge to the establishment, development and maintenance of the implicitly complex, contestable and contingent nature of sustainable agri-food systems.

The individual world views and collective paradigms which frame the actions of each of us at any given moment, reflect not just our superficial beliefs and values or opinions at that time: rather they express four particular sets of deeply held, relatively inflexible and essentially tacit personal and cultural beliefs that we come to assume through our personal family and life experiences, and our cultural histories – yet very rarely question or reflect critically upon. As Guba and Lincoln (1989) relate, these paradigmatic beliefs concern basic assumptions that we hold (1) about the nature of reality – the nature of nature itself as it were (our ontological beliefs); (2) about the nature of knowledge and how we can come to know anything (our epistemological beliefs); and (3) about the nature of human nature most especially with respect to values, including ethics and morals, aesthetics and spiritual beliefs (our axiological beliefs), as well as the cognitive processes by which we generate these. Finally there is the vital paradigmatic significance that all of these assumptions have on (4) the nature of human inquiry and the way that that relates to the manner by which we actually do things (our methodologies) – the way we go about our work as

researchers, educators, extension agents, field technologists, university administrators, policy makers, as agri-business marketers, corporate executives, and NGO operators – and indeed as parents, consumers and as citizens and voters, and so on.

The shift from productionism to sustainabilism as the prevailing paradigm in agricultural science, technology and development, of necessity involves changes in all four of the categories above: for instance, where productionism is grounded in a reductionist perspective (ontology), sustainabilism assumes a holistic position. This in turn, dictates the endorsement and application of systems methodologies, for from an holistic ontological perspective, any whole entity, real or construed, has properties that are unique to it and that are not predictable from studies of any of its component parts in isolation: systems, as they say, are more than the sum of their parts (or better put, are unpredictably different from any of their component subsystems). Systems are therefore said to have an integrity that is characterized by particular emergent properties and are thus deserving of study in their entirety as coherent systems – and by definition, that must include not just agri-food systems but the systems of thought and value systems that we bring to bear as we address the pressing issues of the day.

The paradigmatic shift to sustainabilism also has (epistemological) implications with respect to the nature of knowledge and of meaning. As Douglass (1984) was among the first to acknowledge '[a]gricultural sustainability means different things to different groups of people'. Whenever we talk about *meaning* we talk about knowledge and what we hold to be truth and how we can come to know it and test its validity or usefulness. And as it turns out of course, there are many variations within society at large, about what constitutes truth and valuable knowledge, and this is often a source of difference (and indeed conflict) in interpretations of what can be done in the name of sustainability. Douglass identified three of what he called different 'schools' of approaches to the issue of agricultural sustainability representing distinctly different ways of thinking about it and different sets of values by three distinctly different groups of people: to the first group – 'the productivity school' – the primary focus of sustainability meant the assurance of a continuing supply of

enough food to meet everyone's needs without undue concern for the preservation of either the resource base or the culture of rural life. In contrast, a second group – 'the stewardship school' – approached agricultural sustainability as an ecological phenomenon in which matters of ecological integrity and resource sufficiency were secured over indefinitely long periods of time. Meanwhile, a third group – 'the community school' – extended their concerns in a different direction to focus on the impacts of different types of agricultural systems on the 'vitality, social organization, and culture of rural life' (Douglass, 1984).

These are not simply different scales, or levels, of concern, but profound differences in ways of thinking about issues that involve and reflect differences in world views and in interpretations of meaning which invariably lead, in public debates as well as in the articulation of strategic institutional intentions, to passionate disagreements and arguments. Yet, paradoxically perhaps, there is a strength in this contestability of meaning, for the ideal of sustainability 'gives rise to an agenda of good questions, practical questions that bear directly on our forms of life, drawing out and giving practical substance to our disquiet and to our hopes' (Davison, 2001). These hopes, of course, are functions of the values that we hold – the assumptions about what we believe to be morally 'right and proper', assume to have beauty, dignity and intrinsic value, and hold to be worthy of our aesthetic, ethical and spiritual defence. The injection of values here, demands that we ask what it is that we ought to do in the name of sustainability as well as what it is that we can do, as Thompson (2002) indeed insists: What it is that we *should do* as well as what it is that we *could do* thus become twin concerns for those involved with any academic work – teaching, research or extension/outreach – on the sustainability of agri-food systems.

These latter epistemological and axiological matters, as well as the ontological and methodological issues raised earlier, present very considerable moral as well as intellectual challenges to productionists, for these are not dimensions of the way they work that commonly come under their critical review. And yet, as those of us within the agricultural/rural academy are increasingly urged to engage ever more frequently and profoundly

with the citizenry in collaboratively seeking improvements to the pressing issues of the day, we are drawn inexorably into considering them – and this represents precisely what Boyer was referring to as the ‘scholarship of engagement’ in all of its complexity, including developmental dynamics.

## The challenge of complexity

Over recent years, agricultural researchers and educators have certainly become relatively accustomed to the claim that agriculture is becoming increasingly complex. They appreciate that it is becoming multi-functional, multi-faceted and multi-dimensional. It is involving the interests of multi-stakeholders from farmers to marketers, researchers to policy makers, consumers to citizens, businessmen to environmental and human-rights activists, and so on. It is being increasingly characterized by dynamic phenomena on a truly global scale that include changes in trading patterns and conventions, in ever-changing geo-politics and seismic shifts in relationships between different civilizations, in growing threats of zoonotic pandemics, and even (perhaps especially) in changes in prevailing temperatures across the planet as well as other related global climatic factors. And all of this means that its challenges are becoming multi-disciplinary, inter-disciplinary and even trans-disciplinary, and thus demanding of a new level of reflexivity by those within academia. This imperative is however coming at a time when, on the one hand (1) the historic paradigm is under the challenge of the charge of adequacy and relevance by events, social opinions and social theories alike, while on the other hand, (2) the nature of the work of the academic ‘profession’ and the manner by which academics are rewarded for that work, is making it increasingly difficult for adequate responses to be made to those challenges.

For a significant number of years now, agricultural scientists have been included with other scientists, in a growing current of public criticism of the risky way by which techno-scientific and market-oriented economic modernization is proceeding. We have come to live, so the argument goes, in a ‘risk society’ (Beck, 1992) which is characterized by growing social concerns about the impact of the risks of our own actions as human beings on

the well-being and ultimate survival of ourselves as a coherent species. And this is to say nothing of widespread anxiety about the impacts of our actions on the rest of the life-forms on earth. Where once public concerns were essentially confined to the flow of ‘goods’ across national borders, in a risk society they must now be extended to also embrace the flow of ‘bads’ across the entire planet. The citizenry is now learning to concern itself with, and accept responsibility for the costs, as it were, as well as the benefits of ‘the widening, deepening, and speeding up of worldwide interconnectedness’ (Held *et al.*, 1999).

Among the outcomes of the techno-economic stance in general, has been the rise to dominance of instrumental rationalist knowledge over other ways of knowing (Habermas, 1971) and an elevation of scientists to ‘experts’ who, as some see it, ‘tacitly and furtively impose prescriptive models of the human and the social upon lay people, and these are implicitly found wanting in human terms’ (Wynne, 1996). This in turn has led to a ‘culture of technical control’ (Yankelovich, 1991) as well as to a ‘cognitive authoritarianism’ where ‘the rationality of thinking for oneself diminishes as society’s knowledge gathering activities expand to the point of requiring a division of cognitive labor into autonomous expertises’ (Fuller, 1988). And so at the very time when people in society at large are feeling increasingly empowered to be involved in judgments about the way their food is produced and processed and marketed, they are feeling increasingly disempowered by their lack of inclusion in a discourse that is being dominated by experts who they see, in turn, are limited in their focus and in their notions of useful knowledge, while at the same time often being in disagreement with each other. A timely illustration of these contradictions is provided by the controversies surrounding the introduction of bio-technologies into agri-food systems (witness for instance the recent Supreme Court of India hearing of the Petition in Support of Indian Farmers’ Right to Grow Biotech Crops and Scientific Field Testing).

While rDNA technologies come with the promise of bringing ‘good’, they also have at least a perceived potential for being ‘bad’ in ways that are currently unknown – and perhaps even unknowable, for there are, as Krimsky (1995)



observes, a host of cultural and symbolic dimensions to agricultural biotechnology that introduce further complexities not just to the 'good'/'bad' dichotomy of concrete events, but also to the way we come to judge them in the abstract. Among the key questions that arise and that demand answers in this regard are: is the technology necessary? (and if so, who really benefits from its use – beyond the supplier?) Is it safe in the sense of its potential impacts on human health? What harm could it do to the health, welfare and 'dignity' of 'nature at large'? And in each case, who says so? Each of these questions reflects concerns for sustainability in one form or another. Thus, while sustainability and sustainable development remain contestable constructs (Davison, 2001), they are central aspects of the emerging approaches to what we might refer to as a 'post-industrial' paradigm of agricultural development. Foundational to all of these matters, is an emphasis on *engagement with* and *participation by* the citizenry, of discourse that can be adopted by all of the multi-stakeholders involved, and, most especially of processes of learning – the nature of which adds even more to the complexity of the issue of the quest for sustainable agri-food systems.

## Dimensions of learning

In any agricultural development situation involving public judgment, there will be the need for collective societal learning about the 'matter to hand' – the issue that is considered to be a potential source of improvement by, and for, any given community. There will then be the need for learning about the process of learning itself, for it could well be that the manner by which the 'matter to hand' is being addressed is an impediment to understanding the full complexity of the issues. Finally there will be the need to learn about the intellectual, ethical, and maybe even spiritual beliefs and paradigmatic assumptions, that 'frame' the learning that is occurring at the other two levels. How these might be identified, challenged, and under appropriate circumstances, changed, are outcomes of learning in this third domain. Drawing on the work of the cognitive psychologist Kitchener (1983) we might see these three different 'types'

of learning as a three-level 'system' of cognitive processing: cognition, meta-cognition and epistemic cognition. A key issue here is that each of us as individuals, often through working in social learning situations, can develop in each of these domains. Indeed it can be argued that shifts in paradigms actually represent 'epistemic developments' that are expressed as 'more advanced' states of intellectual and moral understandings as they are reflected in action. A number of very significant theories have been developed about intellectual and moral development, both in childhood (Hoffman, 1970; Kohlberg, 1963; Piaget, 1969) and beyond (Gibbs 2003; Perry, 1968). While the details of the schema presented by different workers differ in their details, their central theses about epistemological, ontological and axiological development through childhood, adolescence, early adulthood and indeed throughout life, are in strong overall agreement. From these workers it would seem that such 'epistemic' advancements have elements that, on the one hand are invariant and universal, while on the other they rely in part 'upon the self's particular and somewhat unique experience' (Kohlberg & Ryncarz, 1990). In either event, epistemic changes of Kuhnian proportions, are achieved essentially through a combination of both 'cognitive challenge' (Salner, 1986) and changed existential circumstances (Gibbs, 2003).

A central argument to be presented here is that the successful adoption of systems approaches to agricultural development demands both particular attention to the intellectual and moral development of all of those involved in such endeavours, and their achievement of particular 'levels' or states of such epistemic development. And this places a very significant emphasis on both learning and participation. As Salner (1986) has submitted, for 'systems learning, with its emphasis on structures rather than on content, epistemic competence may be the most critical competence of all'. Salner goes much further: basing her arguments on Perry's submission that intellectual and moral development typically proceeds from a position of 'dualism to contextual relativism' passing through a number of other 'stages' on the way, she presents the argument that systemic capabilities come only with advanced epistemic development (Salner, 1986). This radical proposition provides a whole

set of new dimensions to those approaches to development that currently embrace both learning and participation as their central features, for it places particular emphasis on the need for explicit attention to all three of Kitchener's levels of cognitive processing. It also provides essential guidelines for those who need to reform curricula, research approaches and forms of engagement, in order to attend seriously to the challenges of sustainability.

## Conclusions

The universal need for food and the life-sustaining connections between all people and the planet means that agriculture is a vital issue of concern and as such, its future developments ought to be matters for public judgment on a truly global scale. These judgments about 'better' agricultures need to embrace ethical, aesthetic, cultural, political, ecological, and even spiritual dimensions of development, in addition to the economic, technological, social and legal ones to which conventional development approaches typically restrict their attention. Such multi-dimensional, systemic views of development draw attention to the need for multi-faceted world views, for intellectual and moral developments, and for a new, universal discourse that all embrace such complexity – while themselves add further to the complexity of the challenge ahead. And yet this is precisely the challenge that agricultural universities and research institutions must firmly address: along with other development organizations, organs of government, the business community, and the media, institutions of education and research, in needing to assume significant responsibilities for the development of such discourses, need also to develop ways of engaging with civil society as well as with each other in a manner quite different from a contemporary position which privileges distinctions between 'the expert' and the 'lay-person'.

Key to all of this is a commitment, by these institutions, to critical engagement which can be nothing less than a critical and conscious commitment to transformation; not just of ways of 'doing things in the world about us', but also of ways of 'viewing that world' and of 'coming to know, understand and value it' in all of its

complexity, as a prerequisite for responsible action to change circumstances in it. In other words, under conditions of complexity and contingency, transformations in the material world – and in the well-being of those within it – are essentially functions of the intellectual and moral capacities to deal with that complexity and contingency, by all of those who are participating in the deliberative process.

The most crucial challenge here lies with the current and upcoming generations of those who are, and will be, responsible for providing the leadership and strategic directions of higher education and research institutions in agriculture and its related disciplines. It is they who must now take the matter of paradigmatic revolutions seriously and they must do that with a sense of urgency and with an intellectual rigour and moral integrity that will provide the essential foundations for the necessary 'new age' and its emergent Paradigm for Persistence.

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