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Strange bedfellows: how knowledge systems became Longer and why they will never be Long

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Introduction

Actor-oriented perspectives in rural development sociology and knowledge systems thinking constitute two academic perspectives in the social sciences at Wageningen University that have flourished alongside each other from the 1980's onwards. While the former originates from the Development Sociology group led by Norman Long, Niels Röling and his colleagues in the Communication and Innovation Studies group developed the latter approach.

Actor-oriented development sociology and knowledge system thinking ostensibly have a lot to fight about. To begin with, since systems cannot have purposes (people have purposes but systems don't), systems thinking is an anathema to sociologists. In addition, systems thinking locks actors into predetermined courses of action, negating their agency. Yet some of us in Communication and Innovation studies have embraced knowledge systems with a vengeance. Secondly, actor-oriented perspectives seem to prefer arenas and battlefields. Actors are locked in struggles and interfaces are abrasive. At most they might enrol each other in their projects. In short, they tend to focus on strategic action. Yet most scholars in Communication and Innovation studies focus on convergence, the innovative performance of theatres of innovation, properties that emerge from interaction, participation, and other forms of collaboration, collective action, and negotiated agreement. We like to probe the opportunities for communicative rationality. And finally, a major issue is that intervention is perceived as the misplaced effort of social engineers that try to predetermine the outcomes of the struggle among actors, which is inherently impossible. Most of us in Communication and Innovation studies see it as our task to train professionals in the facilitation of learning, participatory methods, persuasive communication skills, and other forms of intervention.

Notwithstanding these major differences, the two groups co-supervise M.Sc. and Ph.D. students, co-manage an M.Sc. course, participate in the same research projects and do other things together that assume intellectual agreement. What's is more, one only has to look up Long's review of Röling and Wagemakers

(1998) on Amazon.com, to become convinced of the intellectual agreement, if not bedfellowship of the two paradigms. So how can we explain this contradiction? Is it that the two groups have agreed not to address their differences, to agree to disagree, so as to enjoy each other's camaraderie and bonhomie? Or is it a question of '*on dôit ètre d'accord pour se combattre*', i.e. one has to be close to have something to fight about?

This chapter explores the surprising similarity between the points of departure of the two fields of intellectual endeavour, if only to put into sharp focus their totally different perspectives. The chapter concludes with an exploration of the possible complementary contributions of the two groups to the new field of bèta/gamma studies, which is emerging as an important concern at Wageningen University.

Convergence 1: knowledge systems

Knowledge systems thinking has evolved and changed face considerably over the years. In this section we describe how it started off, and how our thinking was influenced by actor-oriented development sociology.

The initial contradictions between actor-oriented sociology and knowledge systems

In the early days, Knowledge Systems thinking was incredibly primitive (e.g. Röling, 1986, 1988). Its protagonists had the objective of fostering innovation. The objectives were comprised of research, extension and farmers as pre-given actors, and their main focus was on fatal gaps and communication barriers among these actors. But this was a first and necessary step forward from a mono-disciplinary focus on extension education as the critical factor in explaining and promoting innovation, and opened the door to a new perspective on innovation as an emergent property of interaction. Moreover, what was promised was to provide a practical diagnostic framework for the then still existing army of hundreds of thousands of publicly funded extension professionals world-wide that the Wageningen Extension Education Department - the predecessor of the Communication and Innovation Studies group - considered its clientele. Finally, the new emerging perspective on knowledge systems liberated extension education from its isolation as an applied social science with a low status.

Knowledge systems were invented in the United States by scholars like Lionberger (e.g. with Chang, 1970), Rogers et al. (e.g. 1976), Havelock (e.g.1986), Swanson and Peterson (1989). Their work was inspired by the American Land Grant system, which places agricultural research, education and extension in one institution. Through their dependency on the state for their student catchment and on the state legislature for funding, Land Grant Colleges are forced to be responsive to the needs of the state's farmers. The alleged success of American agriculture was said to be attributable to the resulting 'knowledge system' in which the functions of research, extension, education and utilisation are forged into a synergistic whole (Havelock, 1986).

Röling took over the professorship in extension education from Anne van den Ban in 1983. With his 1970 Ph.D. from Michigan State University, his Kenya-

based experience that small farmers could not be helped through extension alone (in fact, extension appeared to be an instrument to make farmers poorer), and the then still widely shared conviction that the success of Dutch agriculture ('the second largest agricultural exporter by value after the US') could be explained by the synergy among agricultural research, education and extension (the 'triptych'), it is quite understandable that a knowledge systems perspective was embraced as a promising concept. In hindsight it proved an excellent choice, but perhaps not for the reasons envisaged at the time! One of the reasons why it was a good choice was that it led to a constructive conflict with the actor-oriented sociology of development introduced by Long when he took over the chair from Rudi van Lier in 1984.

Long was a breath of fresh air. His actor sociology was liberating after the macro sociology and uni-dimensional thinking of the earlier years. Long and Jan Douwe Van der Ploeg (who joined the group a few years later) quickly found each other in a focus on diversity, pluriform development paths, strategic rationality, and agency. What's more, Long - as an Englishman - had none of the inhibitions that Dutch intellectuals usually have that would cause him to think twice before pugnaciously challenging his colleagues.

Knowledge systems soon became a target for actor oriented development sociologists, and the constructive conflict that emerged has since kept scores of M.Sc. students busy in trying to reconcile the apparently totally different viewpoints. But first, we must clarify the fundamental objections of an actor-oriented perspective sociology to knowledge systems thinking as it was in the early days. An initial critical issue is that it is not systems but people that have objectives, intentions, or other voluntary characteristics. In fact, knowledge systems with their assumed functions seemed reminiscent of the functionalism of Talcott Parsons' social systems, and a worse neighbour could hardly be imagined for Long in his endeavours to establish his Wageningen School of actor-oriented development sociology. The system perspective negated the very fundaments of actor-oriented sociology: the agency of actors to make a difference in the social arena. A second area of concern was that the boundaries drawn around the knowledge system to comprise research, extension, education and farmers reified a figment of Röling' imagination, as if those actors really form systems that can be observed in the arena of social life (Later we realised that this type of thinking was 'hard systems thinking'). Long suggested that the study of networks across time and space would be more appropriate. Thirdly, the cosy emphasis on synergy and collaboration among the actors in the knowledge system neglected the conflicts and struggles among the totally different life worlds that one can expect among the assumed components of the knowledge system. Fourthly, knowledge system thinking with its focus on innovation and neglect of culture and context seemed to negate the pluriform development paths and multi-dimensional futures that arise from the clashes of life worlds that emerge in the rich patchwork of development arenas. Fifthly, the exchange of knowledge could not be understood in isolation from the exchange of other resources, and hence the focus of an *aspect* system obscured rather than clarified the issue. If there was any system to be looked at, it needed to be a *social* system.

But your enemies define you, as the revolutionaries say. Long became fascinated by knowledge and acknowledged our contribution in the foreword to his *Battlefields of Knowledge* (Long and Long, 1992).

Towards convergence

And what did we do with the devastating criticism? To understand this, a number of events need to be mentioned. In the first place, Cees Leeuwis, a student of Van der Ploeg and Long, was appointed on a Ph.D. position in the then Department of Extension Education and he defended a dissertation that applied actor sociology and farming styles ideas to the field of extension communication (Leeuwis, 1993). His work was supervised by both Long and Röling and did much to incorporate actor-oriented sociology into knowledge system thinking.

A second major event was the 'discovery' of University of Lancaster's (UK) Peter Checkland and his soft system thinking (Checkland 1981; Checkland and Scholes 1990). This discovery was greatly aided by Röling' visits to Australia where he was exposed to the application of soft systems in land care and agriculture in Queensland's Department of Primary Industries and in what was then Hawkesbury Agricultural College and is now the University of Western Sydney in New South Wales. At Hawkesbury, a group of innovators under the leadership of the Faculty of Agriculture's Dean, Richard Bawden, had incorporated soft system thinking into a revolutionary approach to the academic training of agriculturists as facilitators of the processes required to help Australian agriculture learn its way out of the mess it had created for itself in the 100 years of European settlement (e.g., Sriskandaradjah, et al, 1989; Bawden and Packham, 1993, Woodhill and Röling, 1998). Bawden's group was also heavily inspired by the Chilean biologist Humberto Matura and his work on cognition as the basic process of life (e.g., Maturana and Varela, 1992; Capra, 1996).

Soft system thinking and the Santiago School of biology were eye openers for us in the actor-sociology inspired struggle with the theoretical fundaments of knowledge systems. They introduced the following major elements. The epistemological understanding of the difference between positivism and constructivism, and the ontological understanding of the difference between (naive) realism and relativism, became deeply ingrained as fundamental points of departure for knowledge systems thinking. Soft systems thinking was basically constructivist while hard systems thinking was basically positivist. Hard systems became sub-systems of soft systems. But constructivism did not necessarily imply relativism. Though *a* (not *the*) reality is 'brought forth', it is not simply *any* reality that is brought forth. If you get it wrong, you are likely to become extinct (Maturana and Varela, 1992). A second realisation was that soft systems comprise human actors who share a problem. Soft Systems Methodology (SSM) takes a set of actors through a systemic learning process that potentially ends in a shared perspective that emerges from the 'rich picture' of multiple perspectives among the actors. Such a shared perspective can underpin collective action to address the shared problem. Soft systems are also perceived as constructs that only exist to the extent that the people comprising them accept that they form a system. Soft systems are basically 'human activity systems' (Checkland, 1981). That is, where natural systems (e.g. plants) and designed systems (e.g. computers) can basically be regarded as hard systems, i.e. systems for which the challenge is to realise *given* goals. For soft systems, however, the goals are the major bone of contention. It is in this sense that our earlier knowledge systems with their assumed functions could be considered hard systems. Lastly, soft systems thinking, as it was developed by Bawden and his group, places the observer squarely in the system to be observed (see Figure 1), as opposed to a

system observed from a safe 'hide'. This turns soft systems into reflexive or critical learning systems (Bawden, pers. com. 2001).

Knowledge system thinkers such as Paul Engel (1995: Engel with Salomon, 1997) and Röling found it very easy to embrace soft system thinking. It gave a deep theoretical foundation to knowledge systems thinking, while maintaining its hands-on character in the sense of providing a methodological perspective for facilitating learning processes in the direction of collective action. Key desirable outcomes such as innovation and sustainability became 'emergent properties of soft systems' (Bawden and Packham, 1993). Soft systems linked extension studies into an exciting new world that tied into biology, ecology, and self-organising systems, and allowed it to escape from the strangle-hold of social sciences such as social psychology, public relations and rural sociology which had spawned it.

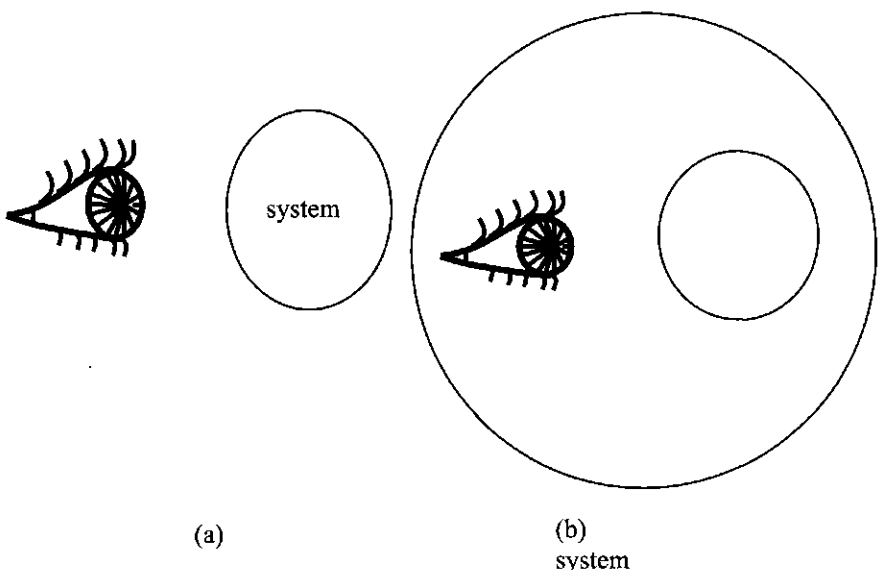

Figure 1: Areas of discourse in hard (a) and soft critical learning systems (b) (after Bawden, *pers. com.* 2001)

Having said this, we have to add that embracing soft system thinking made it easier to incorporate important elements of actor-oriented sociology into knowledge system thinking. Actors with their multiple and conflicting 'life worlds' (i.e. multiple realities) are the obvious components of soft systems. Soft systems with their arbitrary and negotiated boundaries were an obvious improvement over the hard and pre-conceived boundaries Röling (e.g. 1988) had worked with before. Identifying the boundaries of the arbitrary system - as Leeuwis insisted during our first seminar with Peter Checkland in 1993 - became a question of a preliminary actor-oriented, and possibly participatory, exploration (Kwaaitaal, 1993). Instead of a given basis for collaboration among actors, Long's actor-oriented development sociology forced us to consider the possible reasons why, and the processes by which, a bunch of strategic actors struggling to realise their own projects in the arena could be turned around into improving

'*the collective performance of the actors in a theatre of innovation*', as Engel so aptly put in his dissertation (Engel, 1995).

We became totally convinced of the validity of the Long' insistence on non-preconceived observation in the field with a minimum of concepts (such as agency, interface, life world, arena, etc.) rather than an imposition of pre-conceived ideas such as knowledge systems which render the researcher blind. Knowledge systems became a perspective, a diagnostic framework with which one could look at what was actually happening in the field to realise opportunities for collective action. This approach was developed into a fully-fledged methodology (Rapid Appraisal of Agricultural Knowledge Systems or RAAKS) by Paul Engel with Salomon (1997).

With that, Knowledge Systems came of age. It proved a useful and attractive perspective as the basis for the M.Sc. Course Management of Agricultural Knowledge Systems (MAKS) In the MAKS course, Communication and Innovation Studies and Developments Sociology have always co-operated intensively as core groups, joined first by Agricultural Education and later by Paul Richard's Technology and Agrarian Development Group. Perhaps a sign of the times is that 'MAKS' as an acronym stands, but now means Management of Agro-ecological Knowledge and Socio-technical change. But we are running ahead of the story.

Remaining differences

It must be emphasised, by way of completing this section on knowledge systems, that the embrace of the basic tenets of actor-oriented sociology by knowledge system thinking, and the close collaboration within the MAKS course, only served to highlight the remaining differences. Knowledge systems thinking remains relatively blind to conflict. It emphasises communicative rationality rather than strategic rationality that is the hallmark of actor-oriented perspective (Leon Pijnenburg, pers. com.). Knowledge systems thinking remains focused on supporting professional intervention with an assumption that some good can be wrought in this world, while actor sociology continues to look at intervention basically as social engineering and doomed to failure. We shall come back to these points later, as well as to the strange unwillingness of actor oriented sociology to consider the possibility that actors can voluntarily engage in collective action on the basis of trust in institutions, participatory approaches, and non-coercive facilitation of negotiation.

Convergence 2: knowledge, communication and participation

The criticisms directed towards the knowledge systems perspective did not only come from those belonging to Norman Long's department, but also from scholars (sometimes labelled 'infiltrators') within the Communication and Innovation Studies group itself. This is, for example, reflected in a co-production by Leeuwis, Long and Villarreal (1990) in which a number of 'equivocations' on early knowledge systems thinking were presented. As is demonstrated above, many of the concerns were taken seriously by the most outspoken proponents of systems thinking. Some of the remaining issues continue to be 'worked on'.

These include the conceptualisation of knowledge itself, the interrelations between knowledge, power and conflict, and -in connection with this- the way in which the idea of 'participation' is approached and operationalised. As we will show below, additional convergence is forged in these areas.

Knowledge, power and conflict

The influence of an actor-oriented perspective on the way we look at knowledge cannot be overestimated. It is through the lectures, advanced research seminars and writings of Norman Long that we started to (re)read Schutz and Luckmann (1974), Knorr-Cetina (1981, 1988), Latour (1987), Callon and Law (1989) and others. In short, we became social constructivists, and started to invite celebrities like Karin Knorr-Cetina to come to Wageningen. But some of us became more constructivist than others. For purposes of advancing knowledge systems thinking, the idea of 'multiple realities' (see e.g. Long and Villarreal, 1994) was incorporated with enthusiasm by Röling and Engel. However, inspired by Long, Leeuwis (1993: 58-59) argued that this was not sufficient, and that we needed also to come to grips with the political and normative dimensions of differential realities. In other words, that it would be a mistake to look at multiple perspectives as merely originating accidentally from differential experiences and cultural frames, and that we needed to recognise that they were shaped by diverging interests and values, and associated micro and macro politics at social interfaces (Leeuwis, Long and Villarreal, 1990; Long and Villarreal, 1994). The realisation that knowledge and perception cannot be understood in isolation from power, conflict and struggle for resources is an essential proposition in constructivist thinking, which has long been ignored in Communication and Innovation Studies, despite our self-proclaimed constructivism. And indeed not accidentally so, as it seemed incompatible with our interventionist interests and the associated Habermas-inspired embrace of communicative action in knowledge systems thinking. In fact, this illustrates a related idea derived from actor-oriented development sociology (and also from Winograd and Flores, 1986), namely the inherent connections between knowledge and ignorance (see Arce and Long, 1987). More recently, however, there is more recognition for Leeuwis' earlier (1993: 98, 347-386; 1995) observation that 'communicative' and 'strategic' action are in many ways two sides of the same coin. That is, the occurrence and outcomes of interactions that in themselves might well be termed 'communicative action', can only be adequately understood if one recognises that they usually are at the same time strategic actions vis-à-vis *other* communities of actors. Thus, we have gradually come to realise that conflict and power may also play a constructive role in processes of change and innovation. We will further elaborate this when discussing the issue of participation in a next section.

Our changing conception of knowledge had far reaching implications for our field of study. It has led us to re-conceptualise related concepts like communication, and made us rethink the differences between scientific and other forms of knowledge. Communication is now looked at as a process in which meanings are 'negotiated' rather than transferred or subjectively interpreted (Leeuwis, 1993; Te Molder, 1999). Furthermore scientists are basically looked at as particular communities of actors with their own specific epistemic cultures

and rituals, who generate (local) knowledge relevant to their particular locality. The fact that some of them claim universal validity, then, is merely an interesting cultural and political phenomenon, that is often regrettable from the point of view of productive intervention and bèta/gamma co-operation (Leeuwis, 1993, 2000a).

Clearly, these sorts of issues touch the heart of our discipline. Therefore, actor-oriented sociology has consequences for almost everything we study and do, regardless of whether the topic is computer modelling, ecosystems management, Internet debates, health promotion, change management, etc. As such, Long' impact is there to stay, and recognised in several advanced introductions to our field of study (see Röling et al. 1994; Leeuwis with van den Ban, forthcoming)

Participation as a learning and negotiation process

Knowledge systems thinking went along with a plea for 'interactive science' (Röling, 1996) and the promotion of participatory methodologies like RAAKS (Engel and Salomon, 1997) and PTD (Jiggins and De Zeeuw, 1992). At first, we may have been rather naive believers in participation, assuming that it was something that was always desirable and 'good'. However, gradually our conception of 'participation' has altered, and again Long has played a significant role in this respect. First of all, actor-oriented studies (van Arkel and Versteeg, 1997; Zuñiga Valerin, 1998; Amankwah, 2000; Pijnenburg, in prep.) showed that there was often an enormous gap between participatory *rhetoric* (including theoretical discourse) and participatory *practice*. Subsequently, it dawned on us that this discrepancy pointed not only to 'bad' application of participatory principles (which indeed can be frequently observed), but also to fundamental flaws in the theoretical rhetoric (including principles) itself. Many participatory methodologies, for example, still implicitly draw on the mistaken idea (see e.g. Long and Van der Ploeg, 1989) that change is something that can be planned (see Leeuwis, 2000b), and/or mechanically engineered through the application of methods. Similarly, theories and methodologies of participation seemed to ignore almost completely that meaningful change never happens without tension and conflict. To some extent such a 'neutral' representation of participation may have served to make the idea acceptable to governments and the like (Pijnenburg, in prep.). But it is also connected to the Habermassian idea that power can somehow be banned from interactive processes by the creation of 'ideal speech situations' (Habermas, 1984, 1987), and that conflict resolution merely requires the development of a shared understanding of a situation as a result of learning and improved communication. In contrast, studies of participation practice showed that conflicts and power issues usually play a dominant role in shaping the dynamics at different levels and interfaces (e.g. among stakeholders, between stakeholders and interventionists, among interventionists, between local interventionists, governments and international donors, etc.). Along with this, we came to realise that 'participatory intervention' (already a paradoxical term) and search for consensus is not always needed, feasible and/or likely to be productive, and that conflict, competition, leadership, power and 'top-down' intervention can at times contribute significantly to processes of change and innovation (see Leeuwis, 1993).

On the basis of these and other considerations (see for elaboration Leeuwis, 2000b: Leeuwis with van den Ban, forthcoming) we have looked for different foundations and modes of operationalising interactive processes. We feel it is necessary to develop an approach towards participation that does not negate - conceptually and methodologically - the significance of strategic action and conflicts of interest, by somehow rendering them 'normatively undesirable'. Again, an anthropologist aided us, this time in the person of Noelle Aarts who introduced the idea of 'integrative negotiations' in our group (Aarts, 1998; Aarts and Van Woerkum, 1999).

This idea derives from negotiation theory (Pruitt and Carnevale, 1993), begins with the assumption that actors are likely to act strategically in relation to existing and emerging conflicts of interests, and attempts to make this productive to solving societal problems. In integrative negotiations a lot of attention is paid to the facilitation of learning, including social learning (i.e. learning about the interests, values and perspectives of other stakeholders). The idea is that through critical reflection on one's own (and other stakeholders') assumptions, processes can become creative, and result in new joint problem definitions and the identification of 'win-win' solutions. Integrative negotiations, then, are the opposite of 'distributive' negotiations. In the latter, stakeholders tend to hold on to their own perceptions and positions, and basically use negotiations to divide the cake (or the pain). In essence, our basic proposition here is that -in many situations- effective social learning is unlikely to happen if it is not embedded in a well-'managed' negotiation process, while effective negotiation is impossible without a properly facilitated learning process.

Using negotiation theory as a source of inspiration for the organisation of interactive trajectories has far reaching practical implications. It requires new roles, tasks, methods, skills and social status for facilitators of participatory processes, as well as new modes of analysis preceding and during participatory trajectories. The contours of such an integrative negotiation approach to participation are steadily emerging (see e.g. Aarts, 1998; Van Meegeren and Leeuwis, 1999; Leeuwis, 2000b; Leeuwis with van den Ban, forthcoming). It is already quite evident that it shows little resemblance to conventional 'methodology-oriented' approaches like PRA (Chambers, 1994), PTD (van Veldhuizen *et al.* 1997), RAAKS (Engel and Salomon, 1997) and PLA (Pretty *et al.* 1995). Eventually, of course, Norman Long, who has so powerfully demonstrated the negotiated character of development and change, also inspires our flirt with negotiation theory.

Why we retain totally different perspectives

As we said before, the perspectives of an actor oriented development sociology and communication and innovation studies have refused to merge, which perhaps underpins the naivety of knowledge system thinkers who believe that convergence is possible or even likely. In the current section we examine these differences for history's sake. After all, both the actor oriented perspective and knowledge system thinking are likely to be 'passing paradigms' as new protagonists enter the arena. What is more, a focus on differences also serves a

strategic purpose: nowadays too great a similarity only leads to hostile mergers by the university authorities. So, here's to our historical differences.

Focus on inervention

In the eyes of actor-oriented sociologists we have always remained 'terribly normative' (as opposed to norma*n*tive?). Clearly, this relates to the fact that we are, and always will be, 'interventionists', trying not only to deconstruct but also 'reconstruct' society. In fact, we take pride in it. More precisely, we are normative in several interrelated ways. First of all, we are willing to accept -at least for the time being- that certain problem perceptions are relevant, and are worthy of our attempts towards solving them. Thus, as academics we are willing to make our political stance explicit, and try to remain self-critical while doing so. In addition, we do not hesitate - after careful exploration and reflection- to make suggestions about how intervention towards solving perceived problems may be done better and more effectively. We are still interested in 'praxeology' (Röling, 2001). Finally, we tend to propose concepts and definitions that have normative connotations. For an actor-oriented sociologist it is irrelevant, for example, to try and define exactly what 'extension' or 'participation' is. Essentially because -in everyday life - extension (or participation) is everything that actors label to be extension (or participation). Hence, what it actually 'is' can only be clarified through empirical investigation.

For us, such descriptive definitions are in the end not sufficient, since we want to train practitioners and therefore need a vision of what extension (or participation) could and should be. Nevertheless, the descriptive work inspired by Norman Long has been of enormous value to us, also for the purpose of developing praxeologies.

But although Long was aware of the practical implications of his work, and in fact promised to address the issue of transforming intervention practice (see Long and Van der Ploeg, 1989:242), we are not aware of him ever having made an elaborate attempt. What is more, serious attempts to 'help out' in this area were never responded to. An article by Leeuwis and Arkesteijn (1991), for example, tried to tackle the issue 'head on', but did not lead to further debate. The same fate was met by later attempts (Leeuwis, 1993; Engel, 1995). Apparently, the very possibility of being associated with 'normativity' or 'interventionism' is so threatening to actor-oriented sociologists that it prevents them from being explicit about practical implications. In our view, (perceived) peer pressure has contributed to the construction of this deliberate area of ignorance. Here we refer to the belief and/or experience that one cannot be taken seriously as a post-modern sociologist if one resorts to being normative or making even mildly predictive statements. So be it. After all, we are the ones that have benefited from it, since many M.Sc. and Ph.D. students are looking for practical clues. But at the same time we feel that -from a broader perspective- the social sciences in Wageningen could have gained more if we had engaged in more constructive debates on practical matters.

Focus on collective action

It seems beyond doubt that collective action at different ecosystem levels is a condition for dealing with anthropogenic destruction of the vulnerable web of life on which human society depends (e.g., Röling, 2001). Hence collective action, solving social dilemmas in common property resource management (Ostrom, 1990), social capital (e.g., Uphoff, 2000; Uphoff and Wijayaratna, 1999), collective and distributive cognition (e.g., Hutchins, 1995), post-normal science (Funtowiscz and Ravetz, 1993; Funtowicz, Ravetz and O'Connor, 1998), actor network theory (Callon *et al.*, 1986), reflexive modernisation (Beck, 1994) and other perspectives that examine the possible bases for collective action are searching to make contributions to the quest for ameliorating humans' self-inflicted problems. One could also say that the 'soft' side of natural resource use is likely to gain greater prominence as a complement to the conventional focus on hard systems in such institutions as Wageningen University. What's more, participatory approaches, at first a bit of a side show, are increasingly commanding centre stage, also in industrial countries such as the Netherlands, as it becomes increasingly clear that issues, which are highly salient but of which the outcome is highly uncertain, do not easily lend themselves to puzzle solving science, expert-driven solutions, and centralised sectoral institutional decision making (Funtowicz and Ravetz, 1993). The context is changing on both actor-oriented sociology and knowledge system thinking.

Given the premium on understanding (the absence of) collective action, it seems strange that actor-oriented sociology has so little interest in the issue. The relentless strategic rationality of the approach is on par with economics in transforming students into sceptics who are pre-programmed to listen only to strategic narratives (Röling and Maarleveld, 1999). Meanwhile, Communication and Innovation Studies has embraced interactive policy making with a vengeance (e.g., Van Woerkum, 2001). It managed to obtain funding for a number of research projects which emphasise the convergence of actors around solving shared problems, multi-stakeholder management of natural resources, and stimulating interaction among producers and consumers in coming to grips with problems which cannot be solved at lower system levels. Communication and Innovation Studies currently receives little scientific support from development sociology in these enterprises and de-facto collaboration between the two chair groups has decreased in recent years.

But that is regrettable. As we have already explained above, Communication and Innovation Studies has always taken on a normative stance, in the sense that it tries to deal with major societal problems, as they are perceived at the moment. In taking such a normative perspective, it has embraced the need for technical innovation, the need for poverty alleviation, the need to foster policy acceptance, the eco-challenge and other trendy problems, such as multi-stakeholder natural resource management, all in a matter of 30-odd years. Obviously, there is a need for dispassionate, more disciplinarian approaches, such as development sociology and anthropology, which are inspired by scientific rather than societal problems. In that sense, actor-oriented sociologists are characterised more by a tendency to demythologise, deconstruct, and critically demolish trendy discourses, such as participation, than by engagement in them.

Yet this argument does not seem to explain the seemingly total lack of interest in collective action, voluntary collaboration, or the emergence of shared life

worlds, among the Wageningen development sociologists. It has been acknowledged that an actor can be a collective but from then on, it is strategic manoeuvring and battlefields as usual, with little interest in how a bunch of struggling individual actors can *become* a collective actor. It is hard to explain this absence of interest, except perhaps by pointing to the temperament and romantic lure of Latin America whose inhabitants seem to have developed an uncanny tendency to strategically 'psych out' those they encounter. Be it as it may, the two groups continue to differ a great deal in their research interests.

Complementary roles in a Bèta/Gamma University

Long and his colleagues made it their business to develop a Wageningen school of sociology and Long has become one of the most quoted social scientists in the Netherlands in the process. He obviously has succeeded in this quest given the list of publications and dissertations. Meanwhile, several technical chair groups in Wageningen University, especially irrigation, but also forestry, entomology, soil and water conservation, household technology studies and soil science, have been forced to leave their erstwhile technical and hard systems perspectives and embrace social science perspectives to ensure the professionalism of their graduates and the usefulness of their research (Röling, 2001). It is essential to recognise that these shifts have occurred with very little collaboration with the social sciences, although a number of joint dissertations with irrigation (e.g., Van der Zaag (1992) and Bolding (in prep.)), soil and water conservation (e.g., Mazzucato and Niemeyer, 2000), entomology (e.g., Van Schoubroeck, 1999) and other technical departments have been produced. In that sense, the disciplinary focus and further elaborating a Wageningen School of Sociology has not helped. It is typical that Paul Richards, who joined Wageningen more than a decade later than Long, has embraced collaboration with technical departments and 'the social construction of technology' with a vengeance, thereby risking disconnection from his own discipline of anthropology. In his research, technical phenomena, problems and details (rather than actors) are the starting point for further inquiry into social dimensions; this may be a form of research to which technical groups can relate more easily than to an actor-oriented approach.

Meanwhile, it has been increasingly recognised that what the Dutch call 'bèta/gamma science' is crucial to the mission of a successful Wageningen University and Research Centre. Bèta stands in this case for the (bio-physical) sciences, and Gamma for the social sciences, including economics. Bèta/Gamma science therefore emphasises the duality of a soft/hard approach to agriculture and natural resource management. It is quite obvious that Wageningen' main strength lies in developing this Bèta/Gamma approach, a reason why the retooled (2001) M.Sc. course MAKS has embraced Bèta/Gamma science as its main perspective.

Figure 2 is for us is useful in describing Wageningen's move in the direction of bèta/gamma science. *Quadrant I* represents reductionist and positivist disciplinary science, as it is carried out in laboratories. It is the original Wageningen approach in which the best technical means are developed to solve assumed societal problems. *Quadrant II* represents the move to hard systems

thinking which occurred in Wageningen under the influence of Cees de Wit who managed to integrate the work of technical disciplinarian departments into crop growth simulation models. *Quadrant III* represents the embrace of constructivism and soft systems thinking to allow analysis of problems from a bèta/gamma perspective.

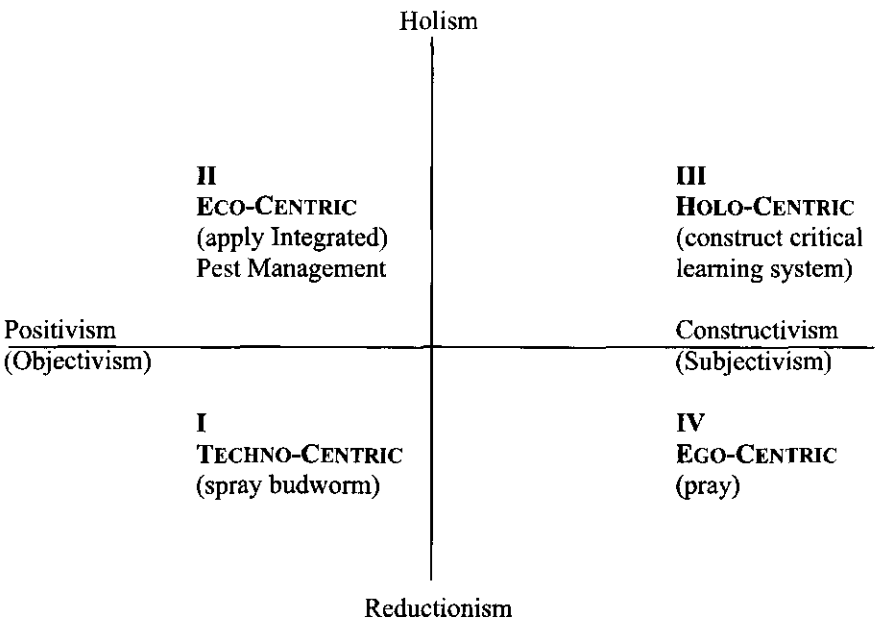

Figure 2: A typology of paradigms in the move towards bèta/gamma science
Based on Miller (1983 and 1985) and Bawden (1997)

Miller (1985, 1987) who initially developed the quadrants to explain the behaviour of fellow scientists engaged in the battle against the spruce bud worm in New Brunswick's forests, distinguished the following approaches. In *Quadrant I*, scientists focused on the budworm as an isolated problem. Their advice was to 'spray'. Scientists in *Quadrant II* realised the hard systems nature of the problem and favoured integrated pest management, which uses natural processes to control the budworm. The (very few) scientists in *Quadrant III* realised that the whole problem of the spruce bud worm was generated by human greed and the planting of large tracts with the same tree species, thus asking for problems in the first place. Their remedy: critical and reflective human learning towards new social and technical arrangements. We believe that the three quadrants represent the different approaches that are required for an agricultural university and research centre such as Wageningen to make a useful contribution. Notice that we stress *all three* approaches. They are all necessary and will have to be used in different combinations, depending upon the nature of the problem (e.g. Tekelenburg, 2001).

We have purposefully left out *Quadrant IV*. We believe it is too early to elaborate that one. If anything, scientists in that quadrant embrace spirituality as an essential element in addressing humanity's self-inflicted predicaments (Van Eijk, 1998; Röling, 2001). But this issue is beyond the scope of this article. It is suffice to say here that we believe that actor-oriented development sociology with a disciplinary focus will have a crucial role to play in the development of a fully-fledged bèta/gamma approach. Long has laid important foundations. Now Paul Richards, another independent English social scientist who is not afraid of pugnacious criticism of his immediate colleagues, is increasingly making his presence felt in developing Wageningen Bèta/Gamma science. His enthusiasm for Mary Douglas' cultural theory is bound to add a new and important dimension (e.g., Hood, 1998). Soft system thinking can be expected to gain from withering criticism of the methodological individualism implied in the focus on emergent properties. That is, the idea that structure, collective action, sustainable development and other 'goodies' emerge from interaction is not much different from the idea that the 'good' market emerges from the selfish search for utility by individuals. Soft systems thinking, then, has much to gain from ideas about how 'institutions think' (Douglas, 1986) for example. And clearly an actor-oriented development sociology has much to offer here as well.

As we have hinted at, we still hope to enter into constructive debates and joint research with actor-oriented development sociologists on issues like intervention, praxeology and collective action, which are all of considerable importance to *Quadrant III*. We feel that the pursuit of building a Wageningen School of Development Sociology -indeed a monument to a great guy- may have hampered such efforts to take place. Yet, the nature and mission of Wageningen University demands that we make progress in this area. This requires us to reflect critically on the dynamics that take place at the interface between Development Sociology and Communication and Innovation Studies, and re-invent our 'bedfellowship'. It has been a worthwhile and productive experience so far, but in order to realise the full potential of actor-oriented development sociology some further 'cross-breeding' is of essence.

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