Curriculum Innovations in Higher Agricultural Education

Edited by Arjen E.J. Wals

CURRICULUM INNOVATIONS IN HIGHER AGRICULTURAL EDUCATION

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FOREWORD

Curriculum Innovations in Higher Agricultural Education is a compilation of two books that originally resulted from the 2000 and 2004 dissemination phases of the EU Socrates Thematic Network for Agriculture, Forestry, Aquaculture and the Environment (AFANet). The first one focused on the integration of sustainability in higher agricultural education, while the second one focused on education and training for integrated rural development. A decision to reprint the two books in a combined volume was made based on the fact that they are both out of print, they have a high demand, and they address similar issues. The combined volume is preceded by a new introduction linking both themes.

Many people have contributed to the contents of this combined volume in one way or another. Hence I would like to acknowledge Peter Holen. Wout van den Bor, Amos Dreyfus, Art Alblas, Marjan Margadant, Robert Macadam, Roger Packham, and Sri Sriskandarajah for their inspirational thinking and work on education in the context of sustainability, which they so generously shared. I also would like to acknowledge the people who helped with the case studies on education and training for integrated rural development: Professor Eduardo Ramos and Dr. Maria del Mar Delgado of the University of Córdoba, Spain; Joe Mannion and Jim Phelan of the University College, Dublin, Ireland; Michal Lošták of the Czech University of Agriculture in Prague, Czech Republic; plus the students, faculty members, and administrators who shared some of their valuable time during the site visits or while participating in the on-line survey. I also thank Reena Bakker-Dhaliwal for carefully proof-reading and copy-editing the manuscript. Finally, I wish to acknowledge Simon Heath, the AFANet Coordinator, for being the driving force behind the AFANet and enabling us to work as a team.

Arjen E.J. Wals Wageningen, September 2004

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INTRODUCTION

Arjen E.J. Wals

"Live your life as if you might die tomorrow, but care for the Earth as if you would live forever" (modified old farming adage)

Education as an institution can be seen as a reflection of the society that supports it. Hence, it is not surprising that some of society's ills can be found in our schools and universities, while the reverse also holds true. Our world is changing with lightening speed. We can either be overwhelmed and be overcome by these changes, or we can take up the challenge to influence their direction, collaboratively and individually, by becoming critically aware of our world and the forces that shape it. Education is not just about knowledge transfer and skills enhancement, it is also about helping people to take charge of their own lives in a shared world. The human development side of education, including education for agriculture and rural development, needs to be explored if we are to cope with the challenges of today and tomorrow.

Education for a changing world

We live in a rapidly changing society. Advances in technology continue to alter the ways in which we perform our jobs, obtain our food, extract raw materials from the earth and communicate with each other. Along with these alterations in lifestyle, our social and natural environments are changing. We often seem unable or unwilling to anticipate how these changes directly affect us and our world. Although technological development has improved the lives of many people, it has also led to the disruption of many others. In the poorer nations of the world, inappropriate technology often upsets the social and cultural order, degrades the environment, and depletes natural resources. Change can be detrimental if we do not take an active role in deciding how it should happen and for what reasons. Naisbitt (1982) describes a shift currently taking place within Western society from an industrial culture to an informational one. In this era, information as a resource is not in short supply; it comes to us with ever increasing speed and in larger and larger quantities from distant places around the globe. As information flows in ever increasing amounts, opportunities for communication multiply. These opportunities have led to the development of numerous ways of exchanging knowledge and insights between people all around the world. Despite this, the information age has often failed to bring people and nations together to solve our common problems. More information does not necessarily lead to better understanding.

Ecological problems, such as pollution of water supplies, disposal of chemical wastes, and global warming, often stem from neglect and inequality. We live in a finite biophysical environment that imposes constraints on human affairs. However, we tend to use raw materials faster than the earth can regenerate them and at the same time return waste products the earth cannot assimilate. We often presume that technology can transcend the carrying-capacity of the earth, but it is now clear that ecological laws cannot be superseded. Although humans have exceptional characteristics that set us apart from other life forms (such as culture, faith, and consciousness), we are only one of many species that interdependently exist in the global ecosystem (Catton & Dunlap in: Humphrey & Buttel, 1982, p. 10-11). Our actions must be consonant with the earth's functions if we are to survive and maintain a reasonable quality of life.

The underlying causes of many social and ecological problems are very similar. The prevalent economic structure favours the exploitation of natural and human resources. Technological advances and the subsequent industrialisation lead to the depletion of natural resources and to a gross inequality between those who benefit from this exploitation and those who suffer from it. Where people used to live in relative harmony with their environment, they are now forced to destroy their natural resources to merely survive on an individual level or to keep up with foreign debt payments on a national level. The rapid depletion of the rain forests and the disruption of the cultures of the people inhabiting them may serve as an example of this phenomenon.

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We have built our society on the practice of analysing information to exploit resources in order to gain material wealth. Progress is defined in terms of material gain and we are encouraged to equate personal success and happiness with economic growth and material wealth. We do so without scrutiny and without exploring alternative values. Progress thus far has not been subjected to a form of ethical control. We tend to ignore several important steps in the decision-making process such as systematically synthesising pertinent information to gain an overall understanding of the situation, carefully weighing the alternatives, and cautiously anticipating the results of our proposed actions, not just for ourselves, but also for others elsewhere and for future generations.

By often failing to approach our problems holistically, we tend to create new problems while we attempt to resolve the old ones. As our problems become increasingly complex, our ability to effectively respond to them diminishes. We need to develop an approach to learning that stresses the development of new competencies that include critical thinking, problem-solving, and cross-cultural learning and awareness-raising. Only then can we go beyond just trying to keep up with the changes and instead guide the changes that take place. Our agricultural schools and life sciences universities insufficiently equip students with the skills most needed in a rapidly changing world. As a result, many young people feel overwhelmed, confused, apathetic, and powerless, and often lack a sense of direction. It is not easy to find life-patterns that are purposeful and satisfying when it seems as though life is out of control. In his book, *Learning for Tomorrow: the role of the future in education*, Alvin Toffler states:

"To function well in a fast-shifting environment, the learner must have the opportunity to do more than receive and store data; she or he must have the opportunity to *make change* or fail in the attempt" (Toffler, 1974).

Today's students, regardless of the type or level of education they follow, *are* facing a world full of controversy and are already involved in making judgements, choices, and decisions that will affect their own lives, their family and society. Therefore education should engage social issues, including environmental issues, and give students experience in addressing them through engagement in critical reflection, social negotiation and the organisation of action (Kemmis, Cole and Suggett, 1983). This does not mean that the schools and universities should become the dumping grounds for fixing all of society's ills or that they should take up sole responsibility where others in society have failed. Neither does this mean that students should *only* be engaged in problem-solving. What it does mean is that students ought to be recognised as valuable actors in the present and future society with the capacity to affect change.

A socially critical orientation to curriculum and instruction requires some major restructuring of the current school systems, the content of the curriculum, and the learning process. Additionally, the role of students and teachers would need to change. Faculty and students would come to assume a greater responsibility for the development, implementation and evaluation of the curriculum. The content of the curriculum would no longer be pre-determined by standard textbooks, external governmental bodies or research institutions. The traditional scientific model for curriculum development would need to be replaced by a model that helps teachers, students and administrators create conditions under which they can take collaborative responsibility for the development, reform and innovation of education (Kemmis & Carr, 1986).

In the new model, 'teachers' are viewed as people who facilitate learning by providing learning experiences that induce change through debate and dialogue. They play an active role in resolving student-teacher contradictions, but also in navigating the force-fields and conflicts that arise when different stakeholders seek change. In problem-solving situations, teachers become co-learners and co-investigators of the world with the student rather than for the student. This is not to say that teachers have no role in organising the learning process. On the contrary, students will need guidance in defining the purpose of their education, conducting their investigations and determining action. In order to be able to do this, firstly teachers need to be aware of the capacities, needs, and past experiences of those they work with, and, secondly, teachers need to include suggestions made by the students in developing a learning plan or project. In Experience & Education, John Dewey's most concise statement about the needs, the problems, and the possibility of education, it is stated that:

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"The [learning] plan... is a co-operative enterprise, not a dictation. The teacher's suggestion is not a mold for a cast-iron result but is a starting point to be developed into a plan through contributions from the experience of all engaged in the learning process. The development occurs through reciprocal give-and-take, the teacher taking but not being afraid also to give. The essential point is that the purposes grow and take shape through the process of social intelligence." (Dewey, 1963, p. 72).

The new role teachers come to assume will lead students to become colearners and co-actors in a collaborative learning process. No longer will they be able to rely on the teacher to think and act for them. "Students and teachers are responsible for a process of reflection upon the world and action upon their perceptions to attain mutual growth and liberation" (Coover et al., 1977). As practice and experience become the driving force for learning, the university and the curriculum will have to change to accommodate the new learning process. No longer is education reduced to seemingly unrelated disciplines.

A socially critical approach to education assumes that learning is enhanced when students' ideas, views, "mini-theories," etc., are acknowledged as being valuable (Driver & Oldham, 1986). If not, learning is likely to be blocked, as will become clear in Part 1 of this combined volume. Thus, for learning to take place, a supportive and safe environment is a basic requirement. This implies a student-teacher relationship that is based on equality rather than on authority. Students should feel free to express their feelings, ideas, and opinions. Creating such an environment is not easy in an educational system that tends to emphasise competition, hierarchy, and individualism. It is even more difficult in the cross-cultural learning environment that is characteristic to a majority of universities today. After all, students with diverse backgrounds also have different views on what constitutes 'good' education, teaching and learning.

Working together toward a solution to a problem of mutual concern reinforces the importance of participation, which is necessary for the survival of a truly democratic society. When advocating a problemsolving approach to teach the basic subjects, schools have to create meaningful learning situations for students. Universities can do this by using the interests, creativity, and curiosity of students as well as the resources the university and the (rural) community provide. When engaged in problem-solving and action-taking that involve real world issues, teachers and students are likely to enter a world of controversy. A socially critical approach to education does not shy away from controversial issues, but tries to utilise controversy and conflict as a source for conceptual change and therefore as a source for learning (Wals & Heymann, 2004). By dealing with controversial issues during their education, students can develop the skills necessary to creatively and successfully discuss and resolve the future challenges they will face.

The transfer of knowledge and skills is an intrinsic part of education, but as is pointed out so clearly in this volume, it is not the whole story. Social development and so-called higher level learning goals, such as moral reasoning, critical thinking and problem-solving, have long been neglected in many educational systems. To become a human being who is able and willing to critically reflect on his or her position in the world and the impact he or she has on the being of others now and in the future, here and elsewhere, requires more than knowledge. To become a lifelong-learner, who is ready to deal with uncertainty and ambiguity, requires more than technical skills. To balance the interests of self. family, local community and communities elsewhere, to balance shortterm gain with long-term survival, requires more than a prescription for being a successful professional. Education, agricultural education included, has an important role in enhancing the lives of students by adding learning for being to the traditional domains learning for knowing (science) and learning for doing (technology). Good education is concerned with human development and thus will need to include teaching and learning areas that transcend the domain of traditional education i.e. conflict resolution, critical thinking, values clarification and development, moral reasoning, environmental ethics and land-use ethics.

Issues of sustainability and integrated rural development involve ethical questions, for instance, regarding the injustice and inequity in sharing the use of the world's natural resources. We do not have clear answers to many of these ethical and moral questions and should not pretend that we do, but we do know that we can not begin to find the answers without also looking at issues of development, peace and conflict, and human rights (not to mention the rights of other species).

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Perhaps a main assertion of this combined volume is that we should involve our students in the challenges of our time. "If the [the university] does not develop the debate [that results from] the doubts raised by [the criticism of the] technical rationality in our way of life, then we will fail to involve [students] in the biggest political challenge of our time" (Bondergaard, 1991). Although nobody exactly knows the right ethical lifestyle, we are all nevertheless responsible for seeking a world which is built upon human equality and sustainable sharing of natural resources, not only between members of the Western world, but the world as a whole. Education for sustainable agriculture and integrated rural development can not just react to crises as they affect the world's (rural) communities, but will have to face the task of helping students become proactive in preventing new crises by enabling them to become critical, flexible, environmentally aware, reflective and constructive professionals who consider themselves lifelong learners.

This book describes not only some of the philosophical underpinnings for curriculum innovation towards a more sustainable agriculture and rural development, but also presents a range of concrete institutional responses. The book, in essence, contains the lessons learnt from a number of initiatives to promote the integration of the concept and praxis of sustainability and integrated rural development carried out between 1997 and 2004 within the framework of the AFANet. These activities included: workshops for teachers and curriculum coordinators from agricultural universities focusing on conceptual issues and practical challenges, an extensive compilation of cases from a number of countries, an on-line discussion of some of the main outcomes of the workshops, and an extensive on-line survey. In the two parts following this introduction these lessons learnt from six years of AFANet curriculum development activity are presented. Part I

INTEGRATING SUSTAINABILITY INTO AGRICULTURAL EDUCATION; DEALING WITH COMPLEXITY, UNCERTAINTY AND DIVERGING WORLDVIEWS

Arjen E.J. Wals Richard Bawden

1 SUSTAIN-ABILITY: WHAT ABILITY AND WHAT TO SUSTAIN?

The urgency to address sustainability issues is increasingly being reflected in the manner in which institutions of higher education around the world are giving priority to the teaching, research and practice of sustainability (Corcoran & Wals, 2004; Walker et al., 2000). Many universities now recognise that they have a critical role to play in helping with the creation of sustainable futures through the education of the current and future generation of professionals, through their research agendas, and through their own institutional practices (see, for example, Ali Khan, 1992; Cortese, 1998).

Sustainability apparently has features that makes it an attractive concept to teachers, students and administrators (Van den Bor et al., 2000) and, as a reflection of this, many institutes of higher education are adopting mission statements that embrace aspects of sustainability. As a concept it provides a focus for the building of bridges between different disciplines and between divergent interests and values. It also presents opportunities for fundamental reforms of curricula that involve the exploration of non-conventional epistemologies and ontologies, as well as non-traditional pedagogical practices that include more experiential or issue-based strategies, more interdisciplinary studies, and more applied practices.

There are those who value the broad-based international political impacts of a sustainability focus in bringing environmental issues to the forefront of both scholarly and practical concerns. Others see sustainability as a way to improve the image of the university within society, and even, among the more cynical, a vehicle to increase enrolments. Others again see the opportunity that a focus on sustainability brings for reflecting on the role that the academy has to play in contemporary society, while behaving as a microcosm of a sustainable community itself in which the quality of the lives of employees and students alike, in parallel with the environment in which they work and live, are paramount concerns. At the same time however, voices can also be heard that are rather critical of the sustainability trend. Some even suggest that it is a dangerous 'hype' that masks power struggles and ideological differences (see for examples: Hesselink et al. (2000); Wals & Jickling (2000; 2002).

It is not surprising that institutes engaged in agricultural education both at the vocational and academic level - are particularly sensitive to the emergence of sustainability. After all, one of the most fundamental threats to sustainable world peace is the Malthusian nightmare of the growth in food supply falling behind ever-increasing global demand. There are already some indications that the world food supply, if not (vet) in actual decline, is not increasing sufficiently rapidly to assure equitable access to, what can be described as, the basic of all human needs. Ironically, one of the most serious threats to further advances in the development of food production systems, is the degradation of both the bio-physical and socio-cultural environments in which it is conducted, and for which present and past agricultural practices are, to a large degree, themselves responsible. There are complex issues here of ethics, aesthetics and other human values, as well as issues of science and technology and economics. In the face of this emerging systemic complexity, the prevailing paradigm for agricultural development, with its narrow focus on production and productivity (productionism), is proving to be seriously inadequate.

Under such circumstances, it is not surprising that there are calls for a new paradigm that has as its context, the search for sustainable approaches to the responsible development of the global food production system/rural environment complex. The challenge here is profound, as such a paradigm must indeed allow for the inclusion of practices that are as ethically defensible as they are technically productive, as ecologically congruent as they are socially desirable, and as aesthetically appealing as they are economically attractive. Given these dimensions, the centrality of the participation of a broad spectrum of stakeholders in debates and discourse about the quest for sustainable food production systems, their design and management, is clearly critical. Such a spectrum not only includes agricultural producers, and the technologists and the scientists that support them, but also the consumers of agricultural products, as well as all others who are affected directly or indirectly by the impacts of agricultural practices on the 'environment' – in essence, all of mankind. Arguments are thus mounted in support of Ulrich's call for 'critical systems thinking for citizens' (Ulrich, 1993) and a number of approaches have evolved over recent years in a number of institutions of higher learning, that respond to this systemic challenge. One such approach, derived from work on 'systemic learning' and participatory environmental education in Australia, is described and presented here. as a framework for considering new strategies both for sustainable rural development in practice, and for pedagogical approaches that facilitate the acquisition of competencies relevant to that. The logic of the approach and of the conceptual model that underpins it reflects the view that the 'citizenry' will only effectively embrace systemic ideas once they have achieved particular 'states of mind' themselves which appear to be triggered most effectively through experiential strategies and critical reflections. Thus it follows that such strategies and critical reflections need to become an integral part of the teaching and learning environment in agricultural education.

The bulk of part I consists of the two remaining chapters. Chapter 2 focuses on conceptual issues with regards to (a) contemporary agricultural practices, (b) matters of globalisation, (c) sustainability itself, and (d) the meaning of education within these contexts. Chapter 3 focuses on the challenge of translating these conceptual issues into curricular strategies and practices within institutes of agricultural education. Specific 'anchor-points' for rethinking both the content and process teaching and learning for agriculture and rural development are presented.

2 CARSONIAN CONCERNS, SUSTAINABILITY AND EDUCATION

2.1 Farming and Globalisation

Farmers have long appreciated the fact that their practices have had unintended, or at least unwanted impacts on their surrounding environments as well as on the resource base of their own farm, and have recognised the prudence of minimising the negative consequences of their actions. As the industrialisation of agriculture has proceeded apace however, the scale of these impacts has increased to now achieve global significance, global both in the sense of the spatial distribution of such impacts, as well as a growing universality of public awareness of the phenomena. The media have been extremely important in this regard, with the publication of Rachel Carson's book The Silent Spring in 1962 (Carson, 1962), which detailed the global and accumulative impacts of pesticide usage, being seminal in illustrating the conjunction of these two aspects of globalisation. This book could be seen to have played a seminal role in increasing the appreciation of the connections between. and concerns about, the global environmental impacts of local agricultural activities. It can also be argued that it played a significant role in triggering appreciation of the need to seek systems of food production that would be sustainable into the future.

A generation later, the ultimate paradox of agriculture would reach 'formal' levels of recognition with the Chairman of the World Commission on the Environment and Development declaring that "Our agricultural practices are both a cause of global degradation and a prime victim of its effects. Agriculture will therefore be an integral part in our efforts to achieve sustainable development both nationally and globally" (Brundtland, 1987). The increasing recognition of these global complexities by the citizenry, and their growing calls for things to be 'better,' are leading to significant critiques of the productionist paradigm itself, and of those who promulgate it. Thus the institutions responsible for its persistence, are being increasingly subjected to what one writer has referred to as "a Greek chorus of criticism" for seemingly ignoring calls to address is-

sues ranging from "environmental degradation; concerns for animal welfare, impacts on the health and safety of farmers, agricultural workers and consumers; adverse nutritional effects of production and processing technologies; the extrusion of smaller family farms from agriculture; the erosion of rural communities and the concentration of agricultural production and economic wealth; inadequate conservation and commercial exploitation of fragile lands that should not be in cultivation" (Buttel, 1985). Of particular significance is the further extension of the "Carsonian concerns" of the globalisation of biophysical impacts, to include unwanted consequences of the globalisation of agricultural trade and the large-scale social transmigrations. All of these phenomena are together creating situations where many of these 'global impacts' are "fundamentally non-linear and discontinuous in both their spatial structure and temporal behaviour" (Hollings, 1994) and thus not only uncertain but inherently unpredictable. As a consequence, we must change our approaches to development, for as Hollings warns "human responses that rely on waiting for a signal of change and then adapting to it will not work".

Taken together, these issues represent really complex social, political, economic, ecological, aesthetic, and ethical aspects, and together they are clearly dictating the need for a more sustainable approach to the development of food production systems which embrace concern for the integrity of cultures and communities across the globe, and of the global ecology including a respect for the intrinsic value of nature, as well as the productivity of the systems themselves. Dealing with complexity, uncertainty, conflicting norms, values and interests in a globalising world, requires a radical transformation of agricultural practices and thus an equally fundamental transformation in the competencies required to be gained by students of agriculture and rural development. In Chapter 3 we will sketch the kind of transformation that we feel is needed, in terms of mission, goals, content and learning process. But before we get to this we need to have a closer look at the matter of 'sustainability' and how it relates to education.

2.2 Divergent views on Sustainability and Education

There are many definitions, descriptions, meanings and interpretations of sustainability. Some argue that this makes it a weak concept positing that when a concept can mean so many different things, it cannot be 'surrounded,' measured and used as a base for comparison, policy-making, scientific inquiry or as a teachable (scientific) concept. Underlving here is the belief that 'When something means so much, it means nothing in the end.' There are also those who are critical of the ease with which different groups in society, often with opposing ideological backgrounds, jump on the sustainability bandwagon. They point out that sustainability can mask ideological differences and can promote 'feel-good environmentalism'. Jickling speaks of Orwellian double speak when people use phrases like sustainable economic growth. He suggests that 'sustainability talk' can lead us in the direction of Orwell's (1989) famously satirical notion of "doublethink" whereby ordinary citizens can increasingly hold in their minds contradictory meanings for the same term and accept them both. Seen this way sustainability tends to blur the very distinctions required to thoughtfully evaluate an issue (Jickling, 1999; Wals & Jickling, 2002).

Others however, perceive a strength in the very ill-defined and apparent political impact of the notion of sustainability. It allows for the contextualisation and the joint exploration of meaning. In other words, through dialogue, discourse, negotiation, joint fact-finding, mediation, etc. people can arrive at their own interpretation of sustainability as contextual and relevant to their own situation within a broader context of ecological responsibility and ethical defensibility. From this perspective, it is argued that given that we do not know what comprises the right or best 'sustainable lifestyle,' it would be wrong for 'technical experts' or the government to prescribe to citizens how they should behave. Teaching for sustainability, from this position is only a legitimate educational goal when the learners are given space for autonomous thinking and self-determination to decide for themselves what counts as sustainable living.

The latter position suggest that educating *for* something (peace, biodiversity, sustainability), unlike educating *about* something, is essentially political and has to do with democracy and participation. Preconditions

for education *for* sustainability then, should include a focus on: transparency of power relations, communicative competence of the participants, diversity of perspectives, values and interests entering the learning process, equal opportunity and access for all learners, and room for creativity and space for alternative, deviant and non-conforming outcomes (Hart, 1997; Wals & Jickling, 2000).

These notions about democracy and participation can also be applied to processes for making decisions about the content and direction of the learning to take place. They generate questions that need to be addressed such as: To what extent are learners and facilitators of learning involved in such decisions? To what extent does education for sustainability respond to the challenges identified by the community? To what extent is the learning process and content sensitive to the ideas, values, interests and concepts embodied by the learners themselves? Figure 1 represents an attempt to position different conceptualisations of education within the force-fields described.



Figure 1: Positioning education in two force fields (after Wals and Jickling, 2000)

It is clear that a discussion of the integration of sustainability in education will need to include a critical reflection on both the meaning of sustainability and the meaning of education. Let us now return to education for agriculture and rural development.

2.3 Sustainability in agriculture: towards an analytical framework

In spite of the increasingly strident calls, over the past decade or so, for changes in the way food production systems are designed and organised, the search for 'more sustainable methods of development' of agriculture and rural communities, has not gained a very significant momentum to date. As emphasised by various contributors to an AFANet-publication entitled 'Integrating Concepts of Sustainability into Education for Agriculture and Rural Development' (Van den Bor et al., 2000), one of the essential reasons for this is the power of the prevailing paradigm of productionism and the impact it is having on interpretations of sustainable development. The debate about the future of agriculture also reveals divergent meanings of sustainability.

In an important book exploring agricultural sustainability in a changing world order, Douglass (1984) introduced the essence and significance of different interpretations of the concept of sustainability. To those who we have been thus far labelling productionists, sustainability relates to the sufficiency of food, with agriculture being regarded by such a paradigmatic constituency, as primarily "an instrument for feeding the world". From this perspective, sustainable agriculture means the sustained capacity of technological innovation to continuously increase agricultural productivity; nothing more, nothing less. A second group, in contrast, recognises sustainability within an ecological context, extending their paradigmatic concerns to embrace the need to reduce "nonharmonious practices" to minimise disruptions to "biophysical ecological balances". To a third group, the concept of sustainability is extended even further to include "promoting vital, coherent, rural cultures, and encouraging the values of stewardship, self-reliance, humility and holism which have been most associated with family farming" (Douglass 1984). The work of Cotgrove (1982) and Miller (1983) on 'cognitive styles and environmental problem solving', suggests a fourth, 'mystic' position on sustainability which can be added to this list, and where environmental problems caused by agricultural (mal)practices can be envisaged as being "rooted in individual consciences and morality; a reflection of our twisted mentalities" (Miller, 1983). Given the differences in the domain in their focus – their centricities – these four worldviews on sustainable agricultural development can be labelled: *egocentric, technocentric, ecocentric, and holocentric,* respectively (Bawden, 1997).

These differing worldviews on the nature of sustainability, present a fertile ground for investigating issues that are at the very heart of the sustainability debate, for they obviously differ very significantly with regard to the focus that each assumes, and the manner by which they address the two key questions of any development: "What constitutes an improvement?" and "Who decides"? There is thus much more to these differences than merely the different levels of complexity that each embraces. At base, each of the respective worldviews can be perceived as representing particular sets of assumptions about (a) the nature of nature (ontology) and (b) how that nature is known (epistemology). The particular conjunctions of epistemological and ontological assumptions with which we will be involved here, are indeed so different from each other across the four perspectives, that they represent aspects of some of the most profound matters of contemporary philosophical tension, as well as containing within them, the seeds of enormously important social conflict and social-ecological disharmony.

An exploration of these differences is an apt entry point for exploring what we will refer to as the systemic/epistemic connection: The connection between systemic ways of thinking and acting, and particular epistemological/ontological competencies.

2.4 Worldviews as conceptual windows on the world

The four worldviews interpretation of sustainable agriculture as identified above, can be 'mapped' on to a conceptual framework that discriminates between profoundly different ontological and epistemological assumptions (Figure 2).



Figure 2: Four conceptual windows on the world (Bawden, 1993)

These distinctions have been incorporated into, what has become known as. the Hawkesbury Critical Learning Systems model, as 'windows on the world' symbolically at the 'interface' between the observer and the observed (Bawden, 1993; 2000). Their explication in discourse is a fundamental aspect of the Hawkesbury approach to the participative development it espouses, and the distinctions that have been chosen in this particular matrix, reflect this practical focus. Thus while it draws particularly on notions presented by Miller (1983), on the role of psychological dimensions in cognitive styles, and on Burrell and Morgan (1979) on sociological paradigms of organisational development. it has its own idiosyncrasies. In particular it draws seminally on systems principles as frameworks not just for understanding the complexity of the human/environment interactions that are involved in agriculture and rural development, but also of the complexities of the processes involved in learning about them. Particularly those processes which involve ontological and epistemological distinctions, and how these come to be appreciated by learners (Bawden, 1990).

Ontological distinctions

The ontological distinctions are based on assumptions about profoundly differing belief positions about the 'nature of nature.' For the purposes of the arguments being elaborated here, a *holist* ontology represents the belief that whole entities have emergent properties that are unique to themselves as such entities, and that are lost once the wholeness is compartmentalised into its component parts (Varela et al., 1991). Holism finds theoretical support and practical application in so-called systems approaches or systemics. The *reductionist* position, in contrast, is grounded in a rejection of such 'neo-vitalism,' arguing that any whole entities are but sums of their component parts, and any 'surprises' that do emerge at the 'level' of the whole, are manifestations of incomplete knowledge rather than of intrinsic properties.

Epistemological distinctions

The epistemological assumptions draw on distinctions elaborated by Bernstein (1983). *Objectivism* here relates to the basic conviction that "there is or must be some permanent, a historical matrix or framework to which we can ultimately appeal in determining the nature of rationality, knowledge, truth, reality, goodness or rightness". In contrast, contextual *relativism* is the basic conviction that the nature of all of these concepts "must be understood as relative to a specific conceptual scheme, theoretical framework, paradigm, form of life, society or culture". Using these distinctions, it is now possible to explore in greater detail, the four sustainability stereotypes for agricultural development, identified earlier.

An egocentric worldview of sustainability

From an egocentric worldview, more sustainable practices of food production are focussed on the satisfaction of the needs and wants of individuals, and the constitution of improvements, grounded in personal conscience and morality. The search for improvements from such a perspective is thus most likely to assume the characteristics of almost mystical introspections. The emphasis on development will therefore be on the betterment of self, relative to prior or existing states, rather than to the state of others, and on individual interpretations of what constitutes improvements from the perspectives of personal utility and morality. It is possible to aggregate this individualistic worldview to communities, societies, indeed to the entire human race, without loss of the essential reductionism or relativism of this perspective. Thus anthropocentricity can be presented as an egocentric worldview when human concerns are exclusive to the agenda of development, and any emergent properties resulting from interpersonal collaboration, if recognised at all, are regarded as mere artifact.

A technocentric worldview of sustainability

A technocentric worldview of sustainable development, emphasises the importance of objective knowledge about the characteristics of those plants and livestock animals which can be manipulated to improve their production potential, as well of biotic and abiotic elements that can also influence production potential. Sustainability then becomes a function of the capacity of scientists to continue to discover more and more scientific truth about the nature of nature, and about how such truth can be used by technologists, to design interventions which continue to enhance the yields of crop, pasture and livestock enterprises across an extraordinarily diverse planet. The reductionism at the heart of this worldview lies squarely with the proposition that improvements to yield will come with the discovery and removal of the next limit to growth. This is regarded as the unquestioned and unambiguous moral commitment of the techno-scientific enterprise, while any other values that cannot be included into such an objective position, can be ignored altogether.

An ecocentric worldview of sustainability

The ecocentric worldview, the first of the two systemic perspectives, rejects the reductionism of technocentricity, while continuing to share its respect for the objectivity of knowledge, truth, and goodness. There is an acceptance here of the basic inter-connectedness of nature, as expressed through the objective findings about the nature of bio-physical ecosystems by ecologists, and about socio-technical systems by many social scientists, especially economists. Goodness is a measure of the value of the outputs of the system. Of particular interest here, is the emerging congruence between ecologists and economists in the search for objective manifestations of the intrinsic value of nature, beyond the utilitarian notions of nature as a resource for human use. The search for sustainable improvements in food production systems from this perspective, focuses on the objective search for methods of increasing the productivity of systems (with money or energy as the currency) without threatening their integrity. Interestingly enough, it is only in recent times that ecologists and economists alike have begun to seriously include the environment in the deliberations of the systems under their review

A holocentric worldview of sustainability

The holocentric worldview is pertinent precisely because people hold on to different worldviews! Improvements in the complex situations involving agriculture and its environments outlined in some detail at the start of part I, emerge only through discourse involving all of those affected by the present situation, and accommodating debates about desirable and feasible change to that. This worldview presents the challenge that the discourse about development be holistic in both intent and process, while recognising the importance of distorted communication, asymmetric relationships of power, and multiple perspectives on what really constitutes 'better.' The commitment is to what we might call a communal rationality, identified through the shared learning of individuals co-operating with a sense of what Bernstein (1983) refers to as "affinity, solidarity, and those affective ties that bind individuals together into a community". Development from this perspective is represented by the notion of research systems seeking to apply systemic thinking and practices in order to improve the relationships between people and their environments which are regarded as inextricably interrelated.

Both the ecocentric and holocentric perspectives, with their holistic ontological foundations, are systemic in nature. Conceptually, the holocentric system is a network of conversations – a critical discourse in which the criticality includes appreciation of the systemic nature of such discourse. In this manner, holocentric systemicity reflects Checkland's (1988) idea of the shift in systemicity from the world itself (the focus of ecocentric worldviews) to the process of inquiry into matters of that world which are considered somewhat problematical. Holocentric dialogue will embrace critical concerns about our assumptions in making systemic judgements (Ulrich, 1993) as well as the need to think critically about both the social consequences of systems designs (Jackson, 1995) and, most obviously from all that has been said about them, their impacts on 'nature.'

It is vitally important to stress the notion that each of these four perspectives on sustainability is legitimate and can reveal vital insights into the process of development when employed carefully. The essential element of that care, is appreciation of the boundary conditions of each perspective, and an accommodation of the different positions held by others, no matter how paradigmatically intransigent they may seem to be. Thus for instance, an egocentric appraisal will allow a reconstruction of personal needs and goals, which even though not intended, could markedly reduce the pressures on particular production systems. Similarly, it will be those with a technocentric orientation, who will inevitably be needed to continue to research new technologies, within contexts, however, established by those who are viewing the world ecocentrically. These contexts in turn, will reflect the more embracing perspectives of holocentricity, and be informed by the insights that can arise when whole communities learn together about what sustainable development can really mean from an holistic/relativistic perspective.

The aim then is not to replace one perspective with another, but to use each to inform the others. We need to move, as Bernstein (1983) has it, "beyond objectivism and relativism", and by the same logic, beyond reductionism and holism. We need not to see these dimensions as incommensurable philosophical dichotomies, but as heuristic devices to inform practical rationality or praxis. From a holocentric perspective, each of these four perspectives can be construed as sub-systems within a system of perspectives, and thus there is a strong case for arguing that this particular perspective is the most liberating. Once we learn to think from such a critical systemic perspective, we can reconstrue the whole concept of perspectives through that memorable insight of von Bertalanffy (1981) as captured by his "glorious unity of opposites".

It is vital to emphasise at this point, that the ability to assume systemic worldviews and, even more significantly, to hold on to different worldviews at one and the same time, are difficult to achieve in practice, involving as they do, what is referred to as epistemic development – or more dramatically, paradigmatic revolutions. This has very important implications for those philosophies and pedagogical practices being recommended here for 'educational strategies for sustainability' (see also Sterling, 2004).

We have stressed the importance of contextualising sustainability and the virtue of multiple realities or perspectives and the conflicts to which they lead. Emphasis has been placed on the human development aspect of education, rather than on the instrumental use of education in trying to alter people's behaviour in a pre- and expert determined direction. Furthermore a plea has been made to complement more traditional ways of looking at the world with more systemic frameworks, which can help learners deal with complexity and uncertainty and can open alternative ways of knowing and valuing. In the next chapter we will look at some of the ramifications of fostering such a view on education and sustainability for education for agriculture and rural development.

3 SUSTAINABILITY, CURRICULUM DEVELOPMENT AND LEARNING

3.1 Sustainability and educational transition

Now that we have reflected on the ill-defined nature of sustainability and the merits of taking a more participatory, democratic, pluralistic, and systemic approach to sustainability, we are better able to discuss the implications of taking such an approach for agricultural education. Some emerging tasks of agricultural education are: to help students learn how to appreciate the differences between particular worldview perspectives on agricultural and rural development, to help them learn to achieve systemic competencies in their application, and in particular, to help them learn how to facilitate discourse which allows 'clients' to do the same. Each of the perspectives on sustainability and development elaborated in previous chapters, has particular strengths, and students are encouraged to explore and understand what these are.

Two main questions will be addressed here:

- What are the didactical and methodological implications for teaching sustainability from a genuinely transformative educational perspective and for the adoption of systemic worldviews?
- Which operational and institutional conditions are necessary to anchor systemic perspectives of sustainability in a revised curriculum?

Here we will return to the main outcomes of the book 'Integrating Concepts of Sustainability into Education for Agriculture and Rural Development (Van den Bor et al., 2000) and related outcomes of the AFANet project focusing on sustainability in higher agricultural education. Six lessons learnt during the AFANet activities appear particularly relevant to and highly compatible with the position described in Chapter 2¹:

¹ We wish to acknowledge the input of Wout van den Bor and Peter Holen who have been instrumental in distilling the lessons learnt from various AFANet activities that took place within the topic 'Integrating Sustainability in Higher Agricultural Education', These lessons learnt can also be found in Van den Bor, Holen & Wals (2000).

Integrating sustainability pre-supposes the re-thinking of institutional missions

The integration of sustainability will never lead to anything fundamentally new if the institution is not prepared to re-think its academic mission. This mission debate should involve all actor groups in the university. It should lead to the re-formulation of the aims and objectives of teaching and research programmes and it should result in a commonly accepted strategy at the macro-, meso- and micro-level. Only then mission statements can become more than a public relations tool.

It is no use crying over vague definitions

Based on the AFANet seminar on *Holistic Concepts of Training for the Promotion of Sustainable Development* (Wagner & Dobrowolski, 2000) held in Krakow, Poland, we are able to distil the following features of sustainability:

- Sustainability is a *reality* (a phenomenon to be taken seriously)
- Sustainability is an *ideology* and therefore *political*
- Sustainability is negotiated, the result of (on-going) negotiations
- Sustainability is *contextual*, its meaning is dependent on the situation in which it is used
- · Sustainability is a vision to work towards
- · Sustainability is a dynamic and/or evolving concept
- Sustainability is controversial and the source of *conflict* (both internal and with others)
- Sustainability is normative, ethical and moral

It should be admitted that the ambivalent nature of the concept of sustainability can be a major conceptual impediment to those who like to work with crisp and clear, narrowly defined concepts: 'Tell me what it is and I'll teach it!' It should also be realised, however, that this vagueness has an enormous canvassing and heuristic capacity if it is systematically and systemically used as a starting point or operational device to exchange views and ideas. These ongoing discussions may generate fruitful working hypotheses for the concrete formulation of curricula, study-programmes, subject matter content and didactical arrangements.

Sustainability is as complex as life itself

The concept of sustainability is related to the social, economic, cultural, ethical and spiritual domain of our existence. It differs over time and

space and it can be discussed at different levels of aggregation and viewed through different windows. Hence, a curricular review in terms of sustainability integration is per definition of an interdisciplinary, systemic and holistic nature. It concerns cognition, attitudes, emotions and skills. It does not lend itself to unilateral, linear planning or a reductionist scientific paradigm and thus involves the systemic integration between theory and practice into systemic praxis.

Teaching about sustainability requires the transformation of mental models

Teaching sustainability presupposes that those who teach consider themselves learners as well. Teaching about sustainability includes deep debate about normative, ethical and spiritual convictions and directly relates to questions about the destination of humankind and human responsibility. In this way it differs from a modernist and positivistic way of thinking. It incorporates notions of the possibility of the finiteness of human existence and trust in human creativity at the same time.

There is no universal remedy for programmatic reconstruction

The inclusion of aspects of sustainability in academic programmes is very much culturally defined. Also it is closely tied to the academic history and curricular tradition of the institution concerned. Consequently, there is no *panacea* for curricular reform. Some institutions will choose to add on to existing programmes, others will opt for a more revolutionary approach. The decision about the most desirable reform approach is time and space specific and can only be taken in an open and communicative process in which all actor groups play their own, respected roles.

Programming sustainability demands serious didactical re-orientation

Based on the earlier mentioned Krakow seminar (Wagner & Dobrowolski, 2000) the following requirements, all pointing at the need for a didactical re-orientation, can be synthesised:

- Sustainability requires a focus on competencies and higher thinking skills
- Sustainability requires a foundational appreciation of holistic principles, critical system understandings, and practical systemic competencies

- Sustainability requires an *early start*, i.e. well before students enroll in universities (from kindergarten through high school)
- · Sustainability requires critical reflection on one's own teaching
- Sustainability requires self-commitment and taking responsibility
- Sustainability requires *empowerment* of learners by enabling them to work on the resolution of *real issues* that they themselves have identified
- · Sustainability requires appreciation and respect for differences
- Sustainability requires courage ('Dare to be different')
- · Sustainability requires creativity as there are no recipes

Integrating aspects of sustainability cannot be realised without thinking very critically about the re-structuring of didactical arrangements. This re-orientation requires ample opportunity for staff members and students to embark on new ways of teaching and learning. For this to happen they have to be given the opportunity to re-learn their way of teaching and learning and to re-think and to re-shape their mutual relationships. These new didactical arrangements pre-suppose a problem orientation, experiential learning and lifelong learning. The following shifts in educational orientation are proposed (Van den Bor et al., 2000; Wagner and Dobrowolski, 2000):

- from consumptive learning to discovery learning
- · from teacher-centred to learner-centred arrangements
- from individual learning to collaborative learning
- · from theory dominated learning to praxis-oriented learning
- · from sheer knowledge accumulation to problematic issue orientation
- · from content-oriented learning to self-regulative learning
- from institutional staff-based learning to learning with and from outsiders
- · from low level cognitive learning to higher level cognitive learning
- from emphasising only cognitive objectives to also emphasising affective and skill-related objectives

Focussing on sustainability provides a wonderful opportunity for accessing higher learning (epistemic development) and new ways of knowing (the paradigmatic challenge) precisely because the concept is (a) so slippery and open to different interpretations, and (b) so complex (involving ethical, moral, aesthetic and spiritual issues as well as the more conventional technical, economic, social and cultural ones). In other words, serious attempts to integrate sustainability into higher agricultural education brings academics into whole new pedagogical worlds - experiential, epistemic, and systemic - which in turn brings them into whole new worlds of learning (and indeed researching) about agriculture and rural development. It is an ideal entrée into epistemology, ontology and ethics. But how do we move from an ideal entrée to the main course? Teachers, students, curriculum developers and study coordinators alike, after rethinking the institution's mission and learning goals, might need something of more substance to work with in redesigning both the process and the content that drives their education.

3.2 Process anchors for integrating sustainability²

The concept of sustainable agriculture implies a change in society's view of the role of nature in the sense that it entails a mutual, symbiotic relationship between people and nature (instead of seeing nature as being in the service of people, and seeing science as a way of achieving society's domination of nature, Mannion, 1995, p. 329). Agricultural education represents a new ideology (Harwood, 1990; Mannion, 1995). which may guide the revision of the curriculum. Educational strategies have been suggested to meet the challenge. Alblas and his colleagues (1995), for instance, suggest strategies based on high relevance to the learner, problem solving, reflective enquiry, dialectical connection between theory and practice, and collaboration between specialists of theory and practice. They put a heavy emphasis on: a) intellectual skills that are relevant to the discussion of controversial issues in situations of social conflict, b) a deep involvement of the learner in the issues at stake and c) the inclusion of diverging interests. With an implicitly socialconstructivist approach, they stress the importance of students' beliefs. ideas, and conceptions.

² In describing the process anchors and content anchors for integrating sustainability we make use of and build upon earlier work published in the AFANet publication that forms one of the pillars of this chapter (Van den Bor et al., 2000). Much of this section can be found in Wals & Dreyfus (2000), which in its turn builds upon Wals et al., 1999. We wish to acknowledge the contributions made by Art Alblas and Marjan Margadant of Utrecht University and of Amos Dreyfus of the Hebrew University of Jerusalem.

Meanwhile Bawden and his Hawkesbury colleagues, while holding similar positions to these, also emphasise the significance of the development of what they refer to as 'systemic competencies' (Bawden, 2000), the importance of multiple worldviews, and the need for experiential strategies as the most appropriate vehicles for such outcomes.

The above strategies emphasise the importance of establishing criteria for enhancing the quality of the learning process and selecting themes for learning that make meeting such criteria possible. We will list eight criteria that have been derived from environmental education research in the Netherlands (Wals et al., 1999).

1 Total immersion

Learning by doing, discovery learning, hands-on learning or experiential learning all have in common that the learner becomes immersed in a multi-sensory way in a learning process that is fundamental enough to have a lasting impact on the state of mind and being of the learner. A learning experience becomes fundamental when the whole person becomes part of the learning experience (i.e. head, heart and hands).

2 Diversity in learning styles

People are not all alike. For agricultural and rural development education to contribute to meaningful learning experiences, educators will have to recognise and be sensitive to the various learning styles and preferences that can be found in a single group. It is unlikely that one particular learning and instruction technique will be appropriate for all involved in a leaning process.

3 Active participation

To become involved in something requires active participation in a dialogue with co-learners and teacher-facilitators. It is through this active participation that the learner develops a sense of ownership in the learning process, its content and its course. Through dialogue, the development of ideas in a social setting, the learner can express his or her feelings or thoughts and become exposed to the feelings and thoughts of others. This confrontation is essential for meaningful learning to take place.

4 The value of valuing

In high quality education for agriculture and rural development the transformation of values and meaning coincide. The motivational and affective aspects of learning should be given equal attention. The process of valuing should at least have the following components or steps (Brugman, 1988):

- Putting in words what is found to be important with regards to the subject at stake (explicating personal values).
- Putting oneself in the positions taken by others with regards to the subject at stake (taking on multiple perspectives).
- Comparing one's own personal values with those of others to recognise commonalties and differences (confronting and relating personal values).
- Investigating and discussing the relationship between personal values and corresponding behaviour (or the lack thereof) (validation of personal values).
- A prime objective of following these steps is to develop in the learner a system of values and valuing which is characterised by flexibility, openness and pluralistic respect (i.e. respect for well-argued alternative values).

5 Balancing the far and near

A contemporary curriculum should reflect a society that increasingly demands the integration of environmental and other global issues. At the same time, such a curriculum should be rooted in the life-experiences of the learner. Inevitably, meeting both criteria will cause some friction. After all, issues of sustainability and development, for instance, are not always existentially relevant. How can we expect someone to take interest in problems that seem physically, socially and psychologically remote? Or, more specifically, how do we design learning activities that move students from passive detachment to active involvement in sustainability issues without having them feel overwhelmed or powerless?

A balance needs to be struck between the far and near of these physical, social and psychological dimensions in order for empowerment of learners to take place. Empowerment here refers to the feeling that one, albeit as an individual or as a member of a group, can shape one's own life and environment.
6 A case-study approach

Human development can be characterised by a double-edged sword with the 'objective' material conditions on one side and the subjective personal needs on the other. Both aspects are relevant for the process and content of education. The challenge is to find exemplary cases that do not only address subjective personal needs, but also address the need for a better understanding of more universal principles (Klafki, 1994). A case-study approach allows the learner to dig for meaning, as opposed to scratching the surface, by focussing on one concrete example for a longer period of time. Taking sufficient time to study a particular issue in-depth is essential and is preferred over studying multiple issues in a superficial way. The teacher needs to take an active role in stimulating learners to expand their boundaries of understanding by challenging them to look further and exposing them to alternative ways of looking at the same issue.

7 The social dimension of learning

The development of knowledge and understanding has both personal and shared elements to it. Social interaction allows one to relate or mirror his or her ideas, insights, experiences and feelings to those of others. In this process of 'relating to' or 'mirroring' (Cassel & Giddens, 1993), these personal ideas, insights, experiences and feelings are likely to change as a result. This mirroring may lead the learner to rethink his or her ideas in light of alternative, possibly contesting, viewpoints or ways of thinking and feeling. At the same time (learning) experiences, which are shared with others, are likely to gain importance. This is not to say that personal experiences, which are kept to oneself, are insignificant. But shared viewpoints or ways of thinking and feeling give the learner a sense of competence and belonging to the community of learners.

8 Learning for action

The argument for including action-taking and the development of action competence in education for agriculture and rural development programmes is threefold. First, one could argue that many people are overwhelmed by environmental, including social, problems as a result of their personal exposure to these problems, for instance, through the ever-present media. It is important to help learners explore environmental issues and to provide them with an understanding of the nature and complexity of these problems. However, education for agriculture

Principle	Description	Examples		
1. Total immersion	Fostering a direct experience with a real-world environmental phenomenon	Observing and monitoring environmental impacts Managing a specific site		
2. Diversity in learning styles	Being sensitive to the variety of learning styles and preferences that can be found in a single group	Offering a variety of didactic approaches Reflecting on the learning process with the learner		
3. Active participation	Developing discourse and ownership by utilising the learners' knowledge and ideas	Soliciting the learners' own ideas, conceptions and feelings Consulting learners on the content of the learning process		
4. The value of valuing	Exposing the learner to alternative ways of knowing and valuing through self-confrontation	Giving learners opportunities to express their own values Creating a safe and open learning environment		
5. Balancing the far and near	Developing empowerment by showing that remote issues have local expressions which one can influence	Relating issues of biodiversity or sustainability to last night's dinner Showing examples of groups of people successfully impacting the local and global environment		
6. A case-study approach	Digging for meaning by studying an issue in-depth and looking for transferability to other areas	Assigning different people to explore different angles of a particular theme and bringing the different angles together		
7. Social dimensions of learning	Mirroring the learner's ideas, experiences and feelings with those of others through social interaction	Taking time for discussion and exchange Addressing controversy Stimulating flexibility and open-mindedness		
8. Learning for action	Making the development of action and action competence an integral part of the learning process	Allowing learners to develop their own course of action and to follow through with it Studying examples of action-taking elsewhere		

 Table 1: Some Process Anchors for Integrating Sustainability in Higher

 Education (source: Wals et al., 1999, p. 28; Wals & Dreyfus, 2000, p. 81)

and rural development should not be limited to this, for it then could easily feed feelings of apathy and powerlessness. It would be dangerous if education for agriculture and rural development would become a repetition of what many of us already know: the environment is in bad shape, our comfortable lifestyles make it worse and the complexity of sustainability issues makes them hard to solve (Monroe, 1990). By bringing in the action-taking component, students can, under certain conditions, begin to take charge of some of these issues and develop a sense of power and control.

A second argument for including action-taking in an education for agriculture and rural development project has its roots in experiential learning thought: one never comes to fully understand a problem with all its nuances and complexities until one fully immerses oneself in the problem, identifies all the players and begins to work within the 'force field' or field of interference towards a joint solution (Wals, 1994a). In other words, we may never really understand the problem until we start to actually implement some potential solutions.

Finally, it could be argued that without the ability and willingness to act it is impossible to participate in or, rather, to contribute to a democratic society. As Jensen & Schnack (1994) point out, and as has been suggested in Chapter 1, a concern for the environment should be connected to a concern for democracy.

Table 1 summarises the process anchors derived from Wals et al., 1999.

The above process anchors appear to be sound from the point of view of psychology of learning and motivation. However, they omit two issues, related to the *content* of what is to be learned according to the new "challenge" of agricultural education: the organisation of the basis of formal knowledge to be learned, and the lack of agreement about some parts of this knowledge.

3.3 Content anchors for integrating sustainability

What education for sustainable agriculture requires is a radical change of the *conception* of agriculture as a practice. This means that the conception of agriculture as "sustainable" must appear to the learner at least as *intelligible, plausible and fruitful* (Posner et al., 1982) as the profit focused conception that prevails in the modern western world. The impact of the curriculum must be strong enough to cause a persistent feeling of unease among the students, bringing them to realise the importance of ecological considerations, then to search for reconciliation between the expected advantages of high-tech production (short-term considerations) and the requirements of social responsibility (long-term considerations). The students must reach a state in which they are willing and able to assess, for instance, whether the justification for using the production technologies they learn about is "outweighed by attendant dangers" (Westra, 1998), or some damage to nature cannot or should not be "traded off" for some invaluable contributions of agricultural production. In some cases, they should be able to check whether or not the environmentalist claims are exaggerated or unfounded.

The balance of plausibility and potential fruitfulness, between production and financial benefits on the one hand, and ecological considerations on the other hand, may not be easily reached in the minds of the students. The "traditional" contents of agricultural education in western countries, e.g., the "know-how" (techniques, practical skills) and its scientific, technological and economical foundations (basic knowledge to be applied), present few dilemmas of plausibility and potential fruitfulness to the learner, because they are directly relevant to the improvement of the productivity and benefits of the agriculturist. It may therefore be difficult to challenge their prevalence in the mind of the students. The same may be claimed about other objectives of agricultural education, such as intellectual skills related to problem solving and decision making on the basis of scientific, technological, and socioeconomical considerations. In contrast, the socio-ecological arguments of sustainable agriculture may appear to the students to be much less plausible and fruitful. What it actually tells them is: "You can earn so much by using X and Y technologies, but you should not, because you may harm the environment, and ultimately, will impair your, or the next generations' capacity to produce "

Agricultural education has so far very seldom endeavoured, if at all, to cope with such *personal conflicts*. The existing learning activities, even when they directly and actively involve students, tend to illustrate the

advantages to citizens of judicious environmental behaviour, as compared with a deplorable existing situation (see for example Wals, 1994b). The required changes in personal behaviour advocated by most programmes (e.g., the three Re's, *Re*cycle, *Re*-use, *Re*duce) imply merely a reasonable effort and very little personal sacrifice, particularly in the case of the much emphasised recycling, which does not really challenge productionism. After all, the more people consume, the more people can recycle... As far as "empowerment" goes in such programmes, it refers mainly to the development of the ability, and of the feeling of ability, to influence "them", i.e., other people, such as the authorities, so that these, in turn, impose required behaviours on still *other* people, such as polluting institutions.

It is doubtful whether even the purposeful "infusion" of environmental contents into traditional curricular contents, in order to enhance the environmental literacy of the students as suggested by several authors (see for example Ramsey et al., 1992), or as used in many STS programmes (see Aikenhead, 1994; Fensham, 1988), is sufficient. What is needed is a systematic effort to confront the students with all the components of the knowledge to be acquired, simultaneously, in direct connection with each other, in relevant contexts, with equal degrees of emphasis and of cognitive demands (scientific knowledge, intellectual skills). The objective of agro-ecological vocational education is not indoctrination, but the development of the ability to weigh alternatives on the basis of equal understanding of all their components. Infusion of sustainability, however defined, into a traditional curriculum is not enough. In addition to paying attention to the process anchors listed in Table 1, attention to the systematic development of a kind of knowledge base is necessary as well. This knowledge base is purposely very broad and includes the following elements:

Interdisciplinary themes

Understanding the production, distribution and consumption side of agriculture from a variety of integrated disciplinary perspectives, i.e. basic natural and social sciences, technologies of production, financing, processing, marketing aspects as well as health, nutrition and consumption components, and cultural aspects of agricultural production (National Research Council, 1988; White, 1990; Dreyfus, 1994).

Environmental impact assessment

Understanding the *environmental* impact of the production, distribution and consumption side of agriculture. This content anchor refers, for instance, to the direct and indirect (such as influence on global warming) influence of high-input and high-energy agriculture. The inventory of such problems is impressive, and varies locally, nationally or regionally according to the agro-technical methods and the crops that prevail in the local setting. As a characteristic example, a voluminous report of the department of agro-ecology in Israel (Capua & Oren, 1998) refers to the use of chemicals ("...cides"), disposal of sewage and waste, use of fertilisers, irrigation, and aesthetic damage to the environment as a side effect of the agro-technical activity or negligence, and bad "agricultural management". Also extremely relevant are biotechnologies. genetic engineering, transgenic methods to increase crop and animal vield, adaptation of organisms to various conditions, and the influence of agricultural techniques on the release of gases into the atmosphere (greenhouse effect). The basic knowledge in this category includes various concepts of ecology and protection of natural resources (e.g., biodiversity, attributes of ecosystems, habitats, conservation, preservation, etc.), which have so far not been central to agricultural education but are pertinent to the development of any approach to sustainability.

Alternative ways of thinking, doing and valuing

Understanding principles of alternative methods of "sustainable agriculture" and their advantages over traditional methods. This content anchor focuses on the concept of "agricultural management". It deals with (1) general factors and policies which underpin holistic views of sustainable agriculture, such as less reliance on non-renewable resources, less environmental degradation, integrated land use systems, economical viability, social acceptability, etc., (as outlined in the discussion by Mannion, 1995, pp. 329-335); (2) specific "clean" agro-technical methods which can be introduced into the existing systems of production (careful use of chemicals, of water and fertilisers, soil protection, treatment of sewage, etc.); and (3) alternative systems of agricultural production, such as organic, bio-organic agriculture, biodynamics, permaculture, eco-villages, Good Agricultural Practice, Integrated Pest Management, etc., (Harwood, 1990; Mannion, 1995; Capua & Oren, 1998: Tilman, 1998). A number of questions could be addressed here: Are there accepted (post-modern?) alternative agro-technical procedures which can be unequivocally shown to be more intelligible, more plausible, more fruitful to the practising farmer then the procedures of modern high-tech agriculture? Are there accepted solutions to the environmental damage caused by modern agriculture? Are there solutions whose advantages and feasibility can be demonstrated scientifically, without "mixing science with advocacy" (ICEE, 1997)? These all involve different ways of viewing the world and different systems of knowing to which students need to be exposed.

Students must also be introduced to ecological/environmental systems of values that will guide their decisions and the development of their attitudes (anthropocentrism, ecocentrism, conservationism, etc.), and to the civic and political systems in their own and other countries (public and civic decision making at the local, institutional, regional, national levels, etc.).

Entering socio-scientific disputes

Understanding and recognising conflicting norms, values and knowledge claims. An environmentally literate graduate of higher agricultural education should be scientifically literate enough to understand the contributions of science and technology to the creation and the solution of human problems and, vice versa, the influence of human problems on science and technology. When seeking to produce and consume in a more sustainable way or when trying to explore sustainable lifestyles, one inevitably enters a socio-scientific dispute as to what the right way of living entails. According to Bingle & Gaskell (1994, p. 187), a socio-scientific dispute is born when uncertain knowledge associated with science-in-the-making (as opposed to the more robust widely accepted ready-made scientific knowledge) inhibits consensus as to the scientific facts. Here statements about knowledge are seen as claims: they are contestable and subject to revision" (Bingle & Gaskell, 1994). In such instances, citizens find themselves facing divided expertise - qualified scientific experts who have produced different scientific findings on an issue or who disagree over the interpretation of the same findings.

A socio-scientific dispute can even arise in the face of scientific consensus. Such a dispute arises when the consensus is challenged from the outside. This is the case, for instance, when the personal experience of citizens is in conflict with "scientific" evidence; when citizens feel that certain scientific knowledge is so new that any consensus on its factual nature must be considered tentative at best; or when certain interests are seen as having undue influence on the consensus position (Bingle & Gaskell, 1994, p. 188). Socio-scientific disputes are issues about which decision making is most problematic. They are in fact a main topic of education for sustainability since they are truly at the interface between science and society. Rather than avoiding controversy and shying away from socio-scientific disputes, post-modern educators should look for them and enter them into the educational process.

Sustainable agriculture studies, a multidisciplinary domain in full development, will lead the students into areas of disagreement between specialists. They must therefore be equipped with both types of knowledge, and with the awareness of the tentativeness of controversial "claims". They must learn to use both ready-made science and sciencein-the making. Education towards a more rational behaviour in cases of socio-scientific disputes may be considered a main goal of vocational agricultural education. In fact, since during the professional life span of the students, socio-disputes about sustainable agriculture can be expected to remain active, some of them being replaced by new ones, the ability to make decisions in situations of uncertain knowledge may be considered to be the main tool for the professional development of future farmers.

Coping with complexity

Understanding and coping with complexity without getting trapped by concerns for the details. Agricultural education, as we have argued, is by definition interdisciplinary. The addition of yet another interdisciplinary area such as "environment" may make it overwhelmingly complex. Higher agricultural education should provide students with skills that make them able to meaningfully, critically and selectively use scientific knowledge. Such use does not necessarily require a full and thorough understanding of all the concepts involved but rather a more functional and systemic understanding of what the concepts do and what they mean to us. People may have, for instance, a functional understanding of what photosynthesis does to our environment (adding oxygen, using solar energy to build organic matter, carbon cycle, etc.) without understanding the complex biochemical processes involved in it. The main idea is to show abstract principles and "theories-in-action" in a concrete situation, instead of trying to prove their existence scientifically (Olsher & Dreyfus, 1999). None of the students can be expected to become high-level specialists in all the domains of knowledge involved. The knowledge taught must be functional, so that the student can use it as a tool for thinking, problem solving and decision making (see Solomon, 1994, referring to STS education).

Competencies in systems thinking and systems practice have been found to be of very significant use with regard to dealing with the complexities and dynamics of contemporary agriculture, natural resource management and sustainable rural development. Amidst the chaos and complexity that characterizes so much of the issues of the day in this regard, systems thinkers look for 'patterns of relationships'. They 'see systems' everywhere they look, even when they look at the processes of 'seeing' and 'thinking' themselves. Systems thinkers typically approach situations and issues in organizations, in communities and in 'nature' alike, with a profound sense of the 'wholeness' and the 'inter-connectedness of it all'. They tend to think in three dimensions - in 'systems of systems' as it were. In this manner they focus their attention concurrently on the system itself, on the sub-systems that interact together to generate that system (and in which they are embedded), and on the supra-system, which represents the environment in which the system is itself embedded

A key assumption here is that any change at any one of the three levels in this 'systemic hierarchy', will invariably have impacts at each of the other levels too: often in a quite unpredictable manner and on a quite unpredictable scale. A small change 'over here' might have a hugely amplified impact 'over there' and even more so, perhaps, further 'over there': and vice versa. The crucial issue is that systems thinkers are always on the lookout for such emergent changes; always conscious of the need to think about actions and their potential impacts, in three dimensions.

The crux of the 'problem of sustainability' to a systems thinker then, is the resilience and adaptability of this three dimensional 'structure': For any system to be able to sustain itself, it must be able to adapt to (and at times adapt) the environmental supra-system in which it is embedded, through somehow manipulating the character of, and/or the nature of the relationships between, its own sub-systems.

The most powerful application of this logic comes when systems thinkers place themselves in the position of being one of the sub-systems of the system/supra-system inter-relationship they are exploring - a learning sub-system as it were. And this reaches an even higher order of significance when the 'learning sub-system' is seen as having three dimensions of organization itself. Level one of a learning system is concerned with the process of making sense of and taking action to adapt (to) a 'matter to hand'. This level is embedded in a higher order of learning which focuses on the process of learning itself - so-called meta-learning. We can learn about the world about us, and we can also learn about how we learn. At the third level, we concern ourselves with learning about the key philosophical assumptions that underpin the paradigmatic assumptions that we hold, as we go about our learning. This so-called epistemic learning, concerns itself with learning about the assumptions that we hold about the nature of nature (our ontology), about the mature of how we know (our epistemology), and about the nature of human nature and the values that help define us (our axiology).

Some argue that it is only through attention to all of these three dimensions of learning that we can learn to attain systems competencies – and therefore to learn how to deal with matters of sustainability from systemic perspectives. All of this clearly has very significant implications with respect to both intellectual and moral development – for the design of curricula that embrace issues to do with sustainability and its paradigmatic multi-perspectives (Bawden, 2000).

To illustrate the above anchors and their interdependency let us look at an everyday dilemma that many farmers face: when and how to use chemical pesticides, if at all. It can be argued that chemical pesticides are usually very effective, from a (short-term) production point of view. Without them, a wide spread world food crisis would have occurred long ago (Katan, 1993). They appear to give the farmer immediate satisfaction concerning crop protection. On the other hand, they are, certainly in the long term, very harmful to the environment. This long-term environmental impact is often not directly perceived by the farmer.

Alternatives to the exclusive use of chemical pesticides consist of, for instance, types of "organic" farming or combined systems, which make use of both chemical and non-chemical tools (i.e. Integrated Pest Management). The basis for the development and use of such methods is essentially scientific and technological: "it encompasses many topics - from the development of mechanisms and modes of action to the development of technologies of implementation" (Katan, 1993). It requires a radical change in the farmers' approach to pest control: eradication of the pest is not seen as a prerequisite to effective control. The operational goal, namely to reach an equilibrium at a level at which both the environment and the farmer's livelihood are sustained, is quite clear. However, managing the *complexity* of understanding and reaching such an equilibrium through alternative methods of crop protection is quite intangible. For one thing, the use of biocontrol agents (one of the main methods of non-chemical controls) is much more complex than that of chemical agents, precisely because they are living organisms and as such much more influenced by the environment. Secondly, "quality control" is often difficult to realize. Furthermore, biocontrol agents are subject to intense disputes and controversy: How hazardous are they? Are they less harmful than pesticides? How can their effectiveness be evaluated? What are the risks involved in the use of genetically engineered (highly improved) biocontrol agents (see also Westra, 1998)?

Table 2 summarises the content anchors generated so far.

Because large industries are involved, and because the research and development efforts require the investment of huge public resources and financial support, the implementation of non-chemical methods of pest control have important sociological, political, and economical aspects. The education of farmers who are able to keep an eye out for alternatives when directly involved in such complex issues will require an intense educational effort. Also, in view of the important socio-economic aspects of the relevant political decisions which must be made concerning the slow and difficult development of non-chemical tools, the "education for action" should clearly not be limited to the agrotechnical personal decisions of the farmer, but should also empower the farmers to act on the political scene.

Feature	Principle	Examples		
1. Inter- disciplinarity	Looking at issues from a variety of disciplinary vantage points and seeking a synthesis	Looking at watershed management from the perspective of nature conservation, agricultural production, recreation and economics		
2. Environ- mental impact	Considering the environmental impact of one's decisions and actions	Monitoring the run-off of minerals into the ground and surface waters, and considering their impact on the watershed.		
3. Eye for alternatives	Being susceptible to alternative ways of thinking, valuing and doing	Alternative ways of applying minerals to the soil to minimise run-off while still maintaining acceptable production levels		
4. Socio- scientific disputes	Recognising and coping with conflicting knowledge claims and the normative aspects of such claims.	Critically evaluate the knowledge claims of environmentalists and sales representatives of Agro- chemical companies with regards to the use of fertilisers		
5. Dealing with complexity	The wise, functional and critical use of expertise and scientific knowledge.	Separating facts from myths and details from essentials in using information to resolve mineral run-off problems on a farm		

Table 2: Some Content Anchors for Integrating Sustainability in Higher Education (source: Dreyfus & Wals, 2000, p. 86)

The anchors in Table 2 are content anchors in that they help a teacher select topics that are able to trigger interdisciplinary fields of study that include environmental impact assessment, alternative ways of looking at an issue, socio-scientific disputes and the need to cope with complexity. They overlap to a degree with the process anchors in Table 2, but the process anchors are intended to help the teacher find suitable learning and instruction activities. Of course it should be kept in mind that although the content, process and goals of education can be distinguished to emphasise a point or to clarify things, they can not be separated in educational practice. In other words: the goals, content and process of learning for sustainability need to be compatible and flow naturally out of each other, since mismatches are likely to block learning.

3.4 Conclusions

When integrating sustainability in higher agricultural education it makes sense to focus on the development of somewhat fashionable albeit fashionable for good reasons - post-modern ideas of empowerment, respect for pluralism, action competence, contextual or local knowledge, authentic learning, grassroots decision making, collaborative and issue-based learning, systemics, and so on, and so on. Indeed, a focus on these components is useful and may eventually launch a new generation of higher education programmes and curricula: ones that are more sensitive to emancipatory learning goals and the contextual, openended and uncertainly-linked nature of the creation of pathways towards sustainability. The current challenge modern agriculture is facing makes clear traditional approaches to higher agricultural education fall short in dealing with uncertainty, in coping with the normative aspects of decision making and in understanding the importance of learning "on the edge", that is, learning at the crossroad of conflicting world views rooted in varying traditions, norms and values.

The topic of sustainability has great potential for post-modern higher agricultural education when considering its ill-defined meaning, its socio-scientific dispute character and its ability to link science, technology and society. Its ill-defined meaning requires specific methods and efforts on the part of both the educator and the learner to make it meaningful in a specific context. Its socio-scientific dispute character requires a procedure for dealing with controversy, uncertainty, diverging values and interests, and moral dilemmas. While its potential to explore, critique and utilise separate ways or systems of knowing, understanding and valuing requires learning processes and contents that provide for a rich context for learning.

Students must certainly keep learning how to produce with maximum financial efficiency. They must continue to learn to use their knowledge and intuition to solve technological and economical problems. In other words, they must learn to solve problems by moving into problem spaces until they design solutions which can be explained and demonstrated in terms of "taking knowledge for granted". However, in view of the crucial environmental crisis threatening the world, their education can no longer ignore the issues of sustainable agricultural development. The content scope of agricultural education must be widened. Students must come to appreciate the importance of environmental arguments that may affect their way of life. They must acquire new intellectual abilities and systemic competencies. They must be educated to make decisions on the basis of uncertain, developing knowledge in various domains, and on the basis of their assessment of tentative claims made by disagreeing but equally qualified experts.

This is an ambitious task for agricultural education, but it is urgent, for sustainable development depends on education of the future citizens. Coming back to Alblas et al.'s (1995) idea of stimulating voluntary changes in behaviour, it is quite consistent with O'Riordan and Voisey's vision (1997) of "the creation of a society and an economy that can come to terms with the life-support limits of the planet. Individuals will have to behave as socially responsible citizens, not self-gratifying consumers, and to care for their neighbours near and far". Agriculture is certainly one of the human activities that greatly impacts the health of our planet. Part II

EDUCATION AND TRAINING FOR INTEGRATED RURAL DEVELOPMENT; STEPPING STONES FOR CURRICULUM DEVELOPMENT

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4 EXPLORING CURRICULUM RESPONSES TO INTEGRATED RURAL DEVELOPMENT

The need for a more integrated approach to agricultural production and the development of rural areas is also clearly evident as land-use claims increase not only in Europe but elsewhere in the world, while, the amount of rural space available is on a continuous decline. Integrated Rural Development (IRD) is an emerging concept or theme in agricultural reform theory, policy and practice. The intention of IRD is to raise the level of economic performance in all sectors of the rural economy, to promote the shaping of viable rural communities, to maintain indigenous cultures, to protect the environment and to conserve the natural features and appearance of the landscape (Wals, et. al., 2004). With an eve towards IRD philosophy, the EU has developed its policy for rural development, which lays stress on simplification, sustainability and an integrated approach. These developments throw up exciting challenges and obligations for agricultural and forestry education sectors, which have traditionally focussed on a narrower scientific model for curriculum development, to provide amore expansive range of skills, competencies and knowledge that is conducive to a more integrative form of development. Part I discussed in detail questions of why a more integrative and systemic perspective in education is necessary and points to what types of key anchors need consideration for long term sustainability. Part II focuses on how to achieve/include some of these considerations by addressing in detail the question: How does the increased pressure for expertise in IRD translate itself into the demand for educational services and the design of appropriate curricula in praxis? Part II further generates a number of stepping-stones for the development of Education and Training for Integrated Rural Development (ETIRD) in tertiary education, based on a two-year inter-institutional curriculum development project carried out under the umbrella of the AFANet.

The overall aim of the ETIRD research project is to explore, outline and develop the communication, education and training strategies that are sensitive to and build upon both universal (i.e. European) and contextual (i.e. local or regional) conceptions of IRD. The project-team, is composed of six experts in either rural development or curriculum development or both, and represents higher education institutions in four European countries (Denmark, Italy, Malta, The Netherlands, and United Kingdom). The objectives of the project, as identified by these experts, are to:

- make an inventory of current curriculum responses to changes in rural land use within European Institutions for Higher Agricultural Education,
- investigate Communication, Education and Training (CE&T) programmes that are suitable for developing notions of IRD among students, i.e. problem-based learning, (soft) systems thinking, interdisciplinary learning, social learning,
- describe four case studies of CE&T programmes for IRD in Europe (focusing on learning goals, learning and instruction methods, contents and learning outcomes),
- share and reflect on participant experiences in the network thus far with regards to alternative learning and instruction methods for teaching and learning for IRD, and
- generate general guidelines for the development of CE&T programmes for IRD in Europe, complemented with examples of the contextual application of these guidelines.

In order to realise the objectives listed above, a research cycle is designed that contains five key elements as represented in Figure 3 and described briefly below. The first phase of the research consisted of an oven exploration of different conceptualisations of IRD and curricular responses to IRD in Europe by the members of the AFANet Team, followed by an inventory of existing ETIRD courses and programmes. This inventory is conducted using an on-line survey and the AFANet database of institutions active in higher agricultural education. On the bases of phase I outcomes, specific cases are selected for further indepth investigation (phase 2) and mediated confrontation (phase 3) activities. Specifically, these two phases consist of the examination and comparison of four case studies from institutions that are selected as being of potential interest to others due to their innovative approach to ETIRD. Phase four consists of *tentative extrapolations* that work towards a consensus regarding the desired direction for IRD education by generating stepping-stones and appropriate curricular responses. In phase five an evaluation of the original conceptualisations of ETIRD is conducted in order to understand how these concepts need modification as a result of the research. Thus, the research itself can be viewed as a learning cycle.



Figure 3: The ETIRD research cycle

The outcomes of all five phases are presented in the following three chapters. Chapter 5 is an inventory of current practices (phase 1); Chapter 6 is a description of selected case studies of "good" practice (phases 2 and 3); and Chapter 7 is a synthesis of key challenges to curriculum development for integrated rural development (phases 4 and 5).

5 AN INVENTORY OF INSTITUTIONAL PRACTISES

In order to implement the first phase (inventory) of the research, a link to an on-line survey on the topic of rural development education and training programs is sent to just over 200 people working at agricultural universities or colleges. The main purpose of the survey is to garner information on the current status of IRD programs and identify programs that indicate a high degree of sensitivity not only to traditional pedagogical practices (i.e. European) but also to non-traditional, integrative, and contextual (i.e. local or regional) aspects of education for rural development. The complete survey can be found on http://www.afanet.info/

A total of eighty-two individuals respond to the survey. Of these seventy-eight represent institutions based in Europe, two represent institutions based in Africa and another two represent institutions based in North America. The main results of the survey can be summarised as follows:

- 100% of the respondents consider rural development education as an interdisciplinary field;
- More than 2/3 (67%) of the representative institutions have created web-sites providing more information about their institution and their specific programmes;
- A majority, 3/4 or 75%, of the participants are highly ranked within their institutions;
- About 1/3 (33%) of the institutions involved teach rural development as a separate course or module; and
- Many, 2/3 or 67%, of the respondents expressed their willingness to participate actively in the development of case studies of exemplary ETIRD in the next phases of the research.

The sometime elaborate answers to the open-ended questions form the basis for the discussion about the goals, content and process of ETIRD and for the selection of the four cases that are developed in the second phase (in-depth investigation) of the research. An initial pool of potential case study institutions is identified depending on the respondents' input to each question and the completeness of a returned survey. In addition, the following selection criteria are utilised to further narrow down the total number of potential case studies:

- A clear and detailed description of the learning goals;
- A clear and detailed description of the teaching approach;
- An in-depth description of their perspective on rural development; and
- An evidence of the respondent's willingness to become part of the research group as a case study key-informant.

The narrowing criteria listed above yield a total of twenty-eight short institutional profiles. The profiles help the team decide which institutions to select for a more in-depth investigation. A sample description of eight of the participating institutions is made available below to provide an overall perspective of the profiles. The profiles are presented as originally received and without language editing. Although not all institutions that responded can be presented below, a complete list of the institutions can be found in Wals et al., 2004.

Institution: Czech University of Agriculture in Prague Country: Czech Republic Course name: Social and regional development

Learning goals

The education responds to the needs of the Czech society which is entering into a European Union structure. The graduates and Ph.D. students should be trained in systemic thinking, to have the abilities of qualified decision-making in solving different types of problems, being able to be emphatic in solving socially sensitive problems in rural areas. The students should obtain theoretical fundaments to be able to cope with designing and implementing various strategies of rural development. They should be able to gather, analyse and interpret various data related to rural areas. They should be able to manage the projects and also be very skilled in using IT.

Teaching approach

A combination of theoretical fundaments with practical addressing real problems in concrete localities. My experience is that students sometime even can help with the problems the communities they live in. I know it is based on the knowledge from the theoretical background and practically elaborated during the seminars. Also using TV programs is useful to demonstrate various issues.

Understanding of Rural Development:

Integrated means to focus with the same emphasis on various aspect of the rural life in the combination with national and global life. It means to address economic social, psychological, environmental, cultural, political, architectonic and other issues together. Only addressing all aspects, the development can be economically profitable, environmentally friendly and socially acceptable (i.e. sustainable development). Integrated development means sustainable development. Moreover it means not to focus on individual sectors or regions but to see the issues in their complexity.

Institution: Humbold-Universitaet zu Berlin Country: Germany Course name: International Agricultural Sciences

Learning goals

Graduates should:

- be able to contribute to the solution of economic and social problems of rural development
- be able to contribute to food security and safeguarding of natural resources
- have the necessary social, scientific and methodological competences
- be able to critically analyze, evaluate and transfer the knowledge gained
- be able to work in teams and in an interdisciplinary way

Teaching approach

Problem oriented learning, small, intercultural groups

Understanding of Rural Development

Solving the puzzle of the "critical triangle"(or; the three E's): achieving production goals (efficiency) and at the same time safeguarding the environment and eradicating poverty (equity issue).

Institution: University College Dublin Country: Ireland Course name: Master of Agriculture science

Learning Goals

The development of a wide range of professional skills and competencies including: appraising and designing projects; planning effective programmes; delivering and managing development programmes; monitoring and evaluating projects; researching the situation; facilitating community development; leadership development; and communication skills.

Teaching Approach:

Exposure to the literature on theory, policy and practice of rural development with a strong emphasis on "hands-on" teaching and learning where principles and techniques are applied to solve practical problems. A field-based placement and research project is an essential part of the Teaching and Learning experience.

Understanding of Rural Development:

Tackling the economic, social and environmental problems of rural areas following a multi-sectoral approach that is participatory at all stages of the project cycle; and involves building effective public private and community partnership structures as a vital element of sustainable development.

Institution: The Pennsylvania State University Country: United States Course name: CEDEV 500

Learning goals

The mai i objectives of the programs are to educate professionals who will assume leadersh.p roles in helping establish and maintain viable communities and community organizations. Graduates will become deeply involved in assisting localities with a variety of issues, including: developing new organizations and new industries, growth management, protecting the environment, revitalizing downtown areas, neighborhood improvement, enhancing the local quality-of-life, assisting educational, social, health and human service systems, and developing vital infrastructure – in short, helping communities shape their own futures. Instruction in the CEDEV program emphasizes training entry and mid-career practitioners in public, non-profit, or private organizations for dealing with the variety of development issues in America's towns, boroughs, small cities, community organizations, neighborhoods, and rural areas. While many universities focus attention on larger urban and metropolitan areas, this is an applied multidisciplinary program that draws on the significant expertise in development of faculty in our department.

Teaching approach:

A combination of theoretical material and applied tools and techniques are used. Education should include seminars and workshops as well as hands-on experience in the laboratory and the field.

Understanding of Rural Development:

Consideration of communities as whole systems which are parts of larger systems. Each is part of the whole and the whole is more than the sum of the parts.

Institution: Agriculture University of Athens Country: Greece Course name: Agricultural and Rural Development

Learning Goals

Students have to acquire a broad spectrum of issues related to rural development. Therefore after the first three years (6 semesters) of subjects relating to various disciplinary aspects of agriculture (including: Political Economy, Microeconomics, Introduction to Agricultural Economics, Rural Sociology, Macroeconomics, Applied Economic Statistics, Agricultural Production Economics, and Mathematics of Finance), a wide range of more interdisciplinary courses is provided such as: Agricultural Policy, Farm Management, Comparative Agriculture, Quantitative Methods in Economic Analysis, Agricultural Marketing, Analysis of the Pricing of Agricultural Products, Agricultural Credit and Finance, Agricultural Education, Agricultural Extension, Agricultural and Rural Development: Theory and Policy, Methods in Agricultural Economics and Social Research, Cooperative Economics, Agro-environmental Policies, Economics of European Integration, Assessment of Agricultural Investments etc. Furthermore, students have to submit a thesis (10th semester). Therefore, students are provided with knowledge relating to the economic, social and environmental dimensions of rural development along with solid knowledge concerning technical aspects of agronomic education and training. The overall aim of the Department concerns the provision of knowledge which, in turn, will allow the students to become capable professionals in the field of sustainable development in rural areas while taking into account the broader framework, i.e. European Integration as well as the world-wide developments concerning the agro-industrial and market conditions.

Teaching approach

In brief, a process-oriented curriculum is needed. The approach has to be systemic/ holistic globally-oriented, and interdisciplinary, involving elements such as learning through action, team work in small groups, learning for an open mind and careful facilitation. Thus, education has to involve elements of creative education like inquiry, discussion, planning, co-operation and appropriate action. Group-work is necessary as it advances communication skills, reinforces the importance of citizen participation, creates meaningful learning situations for students, utilises the interests, creativity, and curiosity of students as it does with controversy which is thus turned to a source of conceptual change. This way, learning is the continuous process of conceptual change and central to this is helping students to advance their learning strategies. Within such a context teachers are to be viewed as facilitators and co-learners. They facilitate learning by providing learning experiences that induce change through debate and dialogue. Teachers have to have the qualities of 'transformative intellectuals'.

Understanding of Rural Development

It means a new paradigm for rural development taking into account the socio-cultural, economic and environmental aspects. The overall aim has to be the close examination of the dynamic balance among many factors such as political, technological, economic, ethical, cultural and environmental. Nowadays, rural development represents a 'way out' of the limitations and lack of prospects intrinsic to the modernisation paradigm and the accelerated scale-enlargement and industrialisation it entails. This new paradigm is of a multi-level, multi-actor and multi-facetted nature. In this context the farming/rural systems approaches have to be utilised in order to understand the multiple dimensions and possible synergies (as well as the negative feedback). Within the framework of rural development new forms and mechanisms for co-ordination and conflict management must be developed; methodologies have to be of a participatory nature.

Institution: Royal Agriculture College Country: UK Course name: International Rural Development

Learning goals

Understanding and competence in rural development from a social, economic and environmental perspective understanding of, and empathy with, other cultures and societies communication skills, project management skills.

Teaching approach

Outline framework, enquiry, case studies, discussion, development of core skills through workshops.

Understanding of Rural Development

Developing and guiding critical human capital in order to balance human demands with the critical capital and the currently dominant economic capital.

Institution: Swedish University of Agriculture Country: Sweden Course name: Extension and Rural Development

Learning goals

To view the rural sector in broader terms

To see rural in systemic terms

To provide opportunity to learn through an action learning medium which of a number of iterations of practice, critical reflection and abstraction.

To provide a conceptual base which will students to critical reflect upon theories, methods and practices pertaining to rural development.

Teaching approach An action learning approach.

Understanding of Rural Development: Integrated rural development requires a systemic view of looking at rural activity. Institution: Lithuanian University of Agriculture Country: Lithuania Course name: The administration of rural development

Learning goals

Programs of studies are orientated to training broad-minded specialists who are able to think creatively and make the best decisions in changing situations in the rural areas

Teaching approach

Learning by creation of projects, discussions and comparative analysis, distance learning, workshops.

Understanding of Rural Development

To me Integrated Rural Development means: sustainable growth of rural areas: social, economical ecological, psychological.

The results of the inventory show a number of common patterns. In terms of the descriptions of the learning goals, most respondents emphasise the promotion of a systemic or broad view or the ability to think out of the disciplinary box in a more holistic or integrated way. Furthermore, many stress the importance of communication skills and the ability to empathise with others. Another learning goal that is regularly cited is that of critical thinking and the ability to critically follow trends in policy-making, society (shifting consumer needs) and farming. Finally, a number of additional competencies are mentioned, including, project management, creative thinking and working in (interdisciplinary) teams.

In terms of the teaching approaches that are favoured by the respondents, again more similarities than differences are apparent. Most stress interactive forms of teaching and learning such as: action learning, workshop-based learning, process-based learning, and hands-on, experiential learning, all referring to learning that supports the creation of a meaningful synthesis between theory and practice in combination with the relevant disciplines.

In terms of the respondents' understanding of IRD, a common pattern of triple P (Planet, People, Profit) and triple E (Equity, Environment, Efficiency) oriented views of rural development emerges. All seem to

call for a more systemic view of rural development involving multiple time scales, multiple stakeholders and sectors, and multiple values.

All respondents are involved in very concrete teaching and learning activities – some by means of a special course or module, some by means of a special degree and some by means of regular courses that seek to include some of the aspects listed above. The case study component of this research is designed to explore good practice in-depth and, in a way, to verify how high-minded social and human development theories in the context of sustainable agricultural and integrated rural development manifest themselves in practice, specifically with regard to curriculum innovations and development. The next chapter highlights the four cases that are selected for in-depth analysis as part of phases 2 and 3 of the ETIRD research cycle.

6 CASE STUDIES

The members of the ETIRD working group further examine the abovementioned eight institutions by studying the submitted documents and the provided web links. Each of the core group members is given an opportunity to express his/her preference for certain institutes that warrant further exploration and analysis. Ultimately however, a good geographical distribution is deemed to be important to allow for possible intra-regional differences and relevance to emerge, while minimizing inter-regional variations. As a result, one institution each from Southern, Northern, Eastern-central and Western Europe is selected. Using the criteria from the on-line survey results, in combination with the personal knowledge of the various institutions of the individual core group members, the following cases are selected: University College Dublin (Ireland), University della Tuscia-Viterbo (Italy), University of Córdoba (Spain), Czech University of Agriculture Prague (Czech Republic). These four institutions are visited by one of the working group members for a two-day period during which time a number of people are interviewed about the respective programs. The site visits result in four cases, which are corroborated by those who are interviewed. Table 3 identifies some key details concerning the four case studies that have been selected.

- A broad list of general guidelines and characteristics that are integral to the case studies is generated at a working meeting of the ETIRD group as follows; A critical and objective evaluation is essential rather than a self-reported 'feel good' subjective impression of what goes on.
- A direct consideration of needs and demands by asking: Whose needs are the courses/programmes taking into account? What interests are being served?
- Although the primary focus of the research exploration is on formal higher education, an awareness and sensitivity to links being made for lifelong learning initiatives and learning taking place within other institutions that support rural development must be present.

- Programmes that promote 'active learning' and 'problem-oriented' learning are of special interest for ETIRD.
- The intended audiences for the case studies are curriculum developers, course co-ordinators and university teachers.
- Either a course or a degree or both may be considered.

Institution	Contact	Address	Country	Email
Czech University of Agriculture in Prague Case developer: Fabio Corporali	Michal Lošták	Dept. of Humanities, Faculty of Economics and Management, Czech University of Agriculture Kamycka 129 165 21 Praha 6 - Suchdol Czech Republic	Czech Republic	Lostak @pef.czu.cz
University College Dublin Case developer: Bill Slee	Joe Mannion	Dept. of Agribusiness, Extension and Rural Development University College Dublin Belfield, Dublin 4 Ireland	Ireland	Joseph.Mannion @ucd.ie
University of Córdoba <i>Case developer:</i> Martyn Warren	Maria Mar Delgado Eduardo Ramos	Equippo Desarrollo Rural Etsiam PO BOX 3048 E-14080 CORDOBA Spain	Spain	es2desem @uco.es
Università della Tuscia - Viterbo <i>Case developer:</i> Sri Sriskandaraja	Prof. Fabio Caporali	Dipartimento di Produzione vegetale, via S.Camillo de Lellis, 01100 Viterbo Italy	Italy	Caporali @unitus.it

Table 3: ETIRD case study conductors and key informants

Subsequently a more focussed list of questions for guiding case study development with regards to sustainability in higher education is formulated based on the six categories proposed by Corcoran et al. (2004). The six categories include ideology, programme drivers, responsiveness, institutional linkages, access and pedagogy. The questions within each category are exemplified below.

A Ideology (values/ethics)

- Is the programme's ideology explicit or not?³
- Is the programme needs based?
- What is the balance between cognitive and affective objectives?
- · Are sustainability issues coupled with issues about responsibility?

B Programme drivers

- What is the programme's ideology?
- Who/what are the programme's drivers (market, client, beneficiaries)?
- · From where do funds for the programme originate?
- What is the policy of the programme?
- · How does the programme address the needs of the individual/people?
- What RD need is addressed by the programme?

C Responsiveness

- Does the programme respond to learners' needs?
- Does the programme respond to employers' needs?
- Does the programme respond to the needs of those interacting with the learners?
- Is peer opinion about the programme sought and valued?
- · Does the programme give space for critical reflection?
- · How is quality assurance carried out?
- Is programme evaluation formative or summative?

D Institutional linkages

- Is the programme linked to other learning initiatives?
- Is learning driven by links to networks and/or NGOs?
- Does curriculum development involve any partners?
- Is there evidence of any networking activity on an academic level? on a local level? on a global level?
- How does the programme fit in within the overall institution's educational framework?

³ Programme refers to a programme of study or a course.

E Access

- Is the programme flexible to respond to different learning styles?
- · Does the programme have flexible entry/exit points?
- Does the programme offer distance-learning opportunities?
- Does the programme offer opportunities for part-time learning?
- Does the programme cater to and prepare learners for lifelong learning?
- F Pedagogy
- Does the programme promote active learning?
- Does the programme address equity/ethical issues?
- Are the learning experiences presented problem based/experiential?
- Is the adopted approach systemic/holistic, hence promoting system thinking and system practice?
- Is the distinction between theory and practice blurred or highlighted?
- Do learning experiences offered foster lifelong learning?
- What are the learning outcomes of the programme?
- What are the competences developed through the programme?
- Does the programme develop conflict resolution skills?
- Does the programme help learners to adequately explore sustainability issues?
- Does the programme present concepts (e.g. sustainability) as fixed or negotiable concepts?
- Does the programme encourage multiple perspectives?
- Does the programme give adequate attention to the development of values?
- Is espoused theory matched with the theory in use in the programme?
- How is knowledge acquired during the programme? Is it disciplinedriven?
- Is IRD learning clearly sequenced?
- What are the assessment approaches adopted by the programme?

It is decided by the team that the case studies need not be structured identically and that it is unlikely that all of the above broached questions can be undertaken. However, to allow for a relative degree of analysis and comparison, the following aspects of a programme must be addressed.

- · Personal history of the programme coordinator/developer
- History of the development of the programme (how it evolved, barriers encountered, how the barriers were resolved, any partnerships)

- The ethos of the programme (what is special about the programme, is there any competition with other programmes)
- The target audience (a brief bio of a typical learner) and the number of learners attending the programme
- · Level of education and entry requirements
- · Aims and objectives of course
- Curriculum plan: main areas addressed, assessment methods adopted, interface with outside organisations/institutions
- Learner evaluation of the programme
- · Programme evaluation by the programme co-ordinator
- · Plans for future development of the programme

In-depth investigation of four programmes

In the following sections The Czech University of Agriculture – Czech Republic, University College Dublin – Ireland, University of Córdoba – Spain, and the University of Viterbo – Italy are each detailed as case studies for phases 2 and 3 of the research cycle. As the in-depth investigation of the four institutions is presented, not only the internal context within the university but an attempt at the larger external context outside the university that influence how each of the ETIRD programmes is developed is also elucidated.

Case Studies: Introduction

In the last century the foremost task of the agricultural sector in many countries has been to intensify national food production in order to guarantee food security. But this main objective is frequently accompanied by other national and socio-economical objectives, no less important, such as: a) the consolidation of a social group responsible for production; b) the integration of the primary sector in the value chain, together with other productive sectors; c) the liberation of labour in rural areas, to be occupied in other sectors and/or territories; d) the accumulation of capital and its transfer to other sectors; e) the improvement in quantity and quality of the level of consumption; and f) the displacement of the added demand.

The protection policies for the agricultural sector, primarily in countries that are able to afford them, are aimed at supporting these various national and socio-economical objectives to the greatest extent possible. The *substitution of imports* strategy, followed not many decades ago by countries such as Brazil, or the European agreement on the desirable model for family agriculture, made clear at the beginning of the Common Agricultural Policy of the European Union, are only two very different examples of these additional objectives and of public policies established to achieve them.

The modernisation process that world agriculture has been experiencing since the green revolution is made possible, among other factors, by the introduction of higher education system linkages to 1) agricultural research and development (i.e. agro-technical or scientific in nature) in combination with 2) research extension (i.e. socio-agricultural in nature) activities. Different countries, according to their degree of relative development and their own strategy for the agricultural sector, attach varying degrees of importance to one, both, or a combination of the two.

Thus, the four institutions in the case study work within the broader contextual realities of their national socio-economical and agricultural policies (external) and the narrower contextual realities that exist within their own institutions (internal). Their programmes are consequently a reflection of both higher-level national strategies and lower-level institutional strategies that involve university management, administration, faculty, and students.

6.1 MSc-degree in Public Administration and Regional Development of the Czech University of Agriculture, Prague⁴

6.1.1 Background

In developing the MSc course on "Public Administration and Regional Development," the Czech University of Agriculture (CUA) applied a methodology that considers the degree curriculum as an input/output educational process (Figure 4).

The decision-making process is influenced by both external and internal inputs or, respectively, external and internal contexts. The external context is influenced by a variety of informational inputs originating from international, national and local level sources. This external input

⁴ This case study is developed by Prof. Fabio Caporali in co-operation with Dr. Michal Lošták.

forms a general framework of reference for decision making. The internal context is influenced by informational inputs originating from within the University, the Faculty, the Departments and the personal preferences of the people initially involved and who initiated the degree development process.

The outputs of the degree course can be described in terms of achievements to be pursued at a personal and an institutional level. Key factors and conditions that demand continuous attention, monitoring and evaluation in terms of personal and institutional achievements include: personal educational success; professional skills and job opportunities of graduates; attitude towards interdisciplinary, participatory, problem solving, experiential and systemic learning; academic staff responsibility; and more general societal benefits for public and private institutions derived from improved networking, local sustainable development strategies, and education at the local, regional, national and international levels.

All the necessary information to build up knowledge about the Public Administration and Regional Development degree course is based on the AFANet IRD online survey and a three-day visit to Prague by the interviewer, Prof. Fabio Caporali. The three-day visit consists of gathering official university documents and other documents from key institutions, interviews with teachers, students and graduates in the degree course, plus interviews with the head of the Department of Humanities and the vice-dean of the Faculty of Economics and Management. Interviews are based on the standard form designed by the AFAnet-ETIRD group (Wals et al., 2004).

6.1.2 External driving forces

At CUA external inputs are a crucial source of motivation in defining new curriculum development strategies. The continuous political and academic processes of harmonisation in Europe are among the most important driving forces in new curricula development. The political harmonisation aspect is built into the SAPARD Programme (the European Union Special Accession Programme for Agricultural and Rural Development) and for academia into the Bologna Declaration. The SAPARD Programme provides support for pre-accession measures for agriculture and rural development in the applicant countries in the preaccession period. The government of the Czech Republic has prepared a SAPARD Plan that is based on the National Programme for the preparation for membership to the European Union in addition to other national and regional plans. The European Commission has accepted the Czech SAPARD Plan and it is now an effective political and implementing programme, to which about 750 projects have already been submitted.

The new goal of meeting pre-accession conditions to the EU force the Czech Republic government to implement dramatic internal restructuring within institutions and to re-organise the demands for human resources, a task necessary after the negative impact of collectivisation on rural communities during post-world war II communism. At the end of the 1960s in Czechoslovakia almost 90% of land is socialised (collectivised), largely in so-called Uniform Agricultural Co-operatives. In 1989, 1656 agricultural co-operatives exist with an average land area of 2591 ha per unit (ranging from 200 ha to 8000 ha) and 171 state farms with an average land area of 8432 ha (from 2000 ha to 80,000 ha). Private farming is almost totally abolished and constitutes only about 3 % of the total arable land (Hudeckova and Lostak, 1992). The preexisting social order, property conditions and rural culture, are progressively destroyed by collectivisation. Nonetheless, a local peasant culture persists in rural villages. The result is that the present rural society lacks the confidence to manage its fate, to cope with problems and to regard the future with a sense of purpose. This general overview of current societal apathy emerges during the interviews with teachers, heads of staff and students. In particular, the characteristics that dominate present day rural communities include an overall lack of solidarity; a lack of interest in civic affairs; an unwillingness to assure public responsibility; an orientation toward work only for oneself and one's family in the course of exchange of services between neighbours; an unwillingness to undertake any private enterprise, especially in agriculture; and a preference for passive entertainment offered by the mass media.

One of the repercussions of collectivisation is that many farmers are not prepared to take responsibility for farming in either the traditional family farms, the so-called agricultural owners' co-operatives, or the newly emerging forms of private non-family farming. As a result agricultural entrepreneurship is almost non-existent. To improve the agricultural environment, the Parliament of Czech Republic approved, as early as 1992, a document outlining some basic strategies for agricultural transition and rural development (Ministry of Agriculture of Czech Republic, 1994). At present, 30% of the land in Czech Republic is farmed by owner co-operatives; 44% by shareholders or limited liability companies; and 26% by family farmers (Green Report, 2000).



Figure 4: Development of a degree course as an input/output process

To implement the national strategy for agricultural and rural development, a cadre of appropriately educated and trained individuals and a readily available pool of human resources are necessary. The task of creating this pool of trained human resources falls on institutions of higher education such as universities. The CUA in Prague (established in 1906) is a leading educational centre in the agrarian sector. The four faculties including 1) Economics and Management, 2) Agronomy, 3) Mechanisation, and 4) Forestry plus the Tropical and Subtropical Agriculture Institute offer bachelor, master and doctoral education programmes to more than 8500 students (both full and part-time). The CUA is an open university, where curricula and research strategy are developed in collaboration with Czech and foreign universities, namely in Vienna, Berlin, Zurich, Wageningen, Uppsala, Cork, Plymouth, Copenhagen, Montpellier, etc. The original idea for the development of a degree course in "Public Administration and Regional Development" emerged from previous contacts with the other European institutions. The Faculty of Economics and Management (FEM) within the CUA is responsible for the development of the course structure and content.

FEM educates specialists for the management of technological processes in agriculture and in the wider economy (i.e. finance, banking, insurance, informatics, business and trade). In its research and advisory work FEM focuses on the needs of the agrarian and rural/regional sectors of the Czech Republic in the whole range of business activities, as well as with the wider economy and both the public and private sectors. Four thousand students attend the FEM. A CUA evaluation report states, "FEM at CUA in Prague ranks among very well functioning economic faculties comparable with those abroad. It has attained very good results in the sphere of pedagogical and research activities". In 2001, the FEM's placement in the top level-group A - was reconfirmed on the basis of re-accreditation of pedagogical and research activities.

Global contacts and international cooperation are at the core of the faculty's programme development, with the underlying expectation that the increased contacts will lead to a) a higher level of education and research; b) an expansion of cultural opportunity for the students and staff; c) an increase in acquisition of financial resources from international programmes; d) an improvement in international credit; and, finally, e) an extension of didactic co-operation with foreign partners.
6.1.3 Structure and functioning of the MSc in Public Administration and Rural Development

The MSc in Public Administration and Rural Development (PA & RD) is established in the academic year 1999-2000, following a faculty board decision in the context of a long-term strategy development as described in section 6.1.2 above. The study curriculum is accomplished in co-operation with the Czech Ministry of Agriculture, the Agrarian Chambers of the Czech Republic and foreign university partners such as Wageningen University, Netherlands; BOKU, Vienna; SLU, Uppsala; and Humboldt University, Berlin. The structure of the curriculum is illustrated in Table 4, where 16 core courses with their associated units of credit are allocated according to their semester position and to their academic disciplines (corridor or orientation). This MSc is a two-year, four-semester degree course.

The philosophy of the degree programme calls for an integration of each of the four disciplinary area or corridors i.e. Economics, Management, Public Administration, and Regional and Social Development into each of the four semesters. As the programme progresses, the teaching and learning develops from more general and theoretical concepts in the first two semesters to more specialised and applied knowledge, problems and solutions by the last two semesters. Within the larger disciplinary corridors, a more internal coherence among each discipline is pursued by the coordination of their contents.

The integration between theory and practice at the curriculum level is realised by the implementation of a project (Master thesis or Diploma thesis) which consists of a four-step process with one step to be completed in each semester. A project (Master's thesis) is usually completed by the execution of sequential steps as follows:

- Problem identification the establishment of the theoretical part of the project including literature review and the theoretical background set up for the work.
- Project methodology a detailed definition of the project objectives and the elaboration of the methodology to be used in the project work.
- Project implementation the empirical and practical work such as the acquisition of data for project research goals in accordance with the methodology and theoretical conditions elaborated earlier. This is with the supervision and co-operation of a local influential group.

			Corridors or O	rientations				
Semester	ECTS					Available E	xtra courses	Project (Master thesis)
		Economics	Management	Public Administration	Social and Regional			
			~	F	4	5	•	
		Agricultural policy	Regional	Administrative	Political life in	Social Policy		Project
		(Dept. Agric.	Administration	and Procedural	Regions and	(Dept. of		10 ECTS
4		Economics)	(Dept. of	Law	municipalities	Humanities)		
		5 ECTS	Management)	(Dept. of Law)	(Dept. of	4 ECTS		
	99		SUJ	SECIS	4 ECTS	*		
		World Economics	Strategic	Public Law	Social and	Software Used		Project
		(Dept. Agric.	Management	Concerning	Regional	in Development		S ECTS
3		Economics)	(Dept. of	Business and	Development	Project		
		5 ECTS	Management)	Commerce	(Dept. of	(Dept. of		
	_		6 ECTS	(Dept. of Law)	Humanities)	Statistic)		
				5 ECTS	4 ECTS	4 ECTS		
		Local life and	Development	Law and Justice	Politícal	General	Social	Project
		Municipality	of Rural	(Dept. of	Science of	Economics	Communication	5 ECTS
2		Management	Enterprising	Humanities)	Rural Area	(Dept. of .	and Rethoric	
		(Dept. of Finance)	(Dept. of	5 ECTS	(Dept. of	Economics	(Dept. of	
		5 ECTS	Management)		Humanities)	Theories)	Psychology)	
			5 ECTS		5 ECTS	6 ECTS	3 ECTS	
	60	Envíronmental	Regional	Social and	Methods and	Information		Project
		Economics	Employment	Political Ethics	Techniques of	Systems in		5 ECTS
		(Faculty of	(Dept. of	(Dept. of	Sociological	Public		-
-		Forestry)	Management)	Humanities)	Research	Administration		
		5 ECTS	5 ECTS	4 ECTS	(Dept. of	(Dept. of		
					Humanities)	Information		
					5 ECTS	Technologies)		
						5 ECTS		

TAble 4, MISC III I UDIK AUMINISTIATIVII ANU REGIONAL DEVELOPHICHT	Table	4: MSc	in Public	: Administi	ration and	Regional	Development
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• Project analysis and report writing – the assessment of the project outcomes, data analyses and interpretation with suggested problem solutions and a conclusion. Assimilation of the four project steps in a final write-up or thesis.

Problem solving and experiential learning are crucial components in the process of project development and implementation.

6.1.4 Regional Integration for Rural Development

The MSc focuses on strategies of regional integration of rural development. To achieve this goal, teaching facilities are used which combine full-time campus and distance studies. The Faculty of Economics provides teaching in four centres for distance learning in the Czech Republic (Prague, Cheb, Most and Hradec Kralove). The three regional centres (Cheb, Most and Hradec Kralove) have been chosen because they are located in regional areas with different characteristics in terms of socio-economic and bio-physical conditions. The core curriculum is modified according to specialisations, which are tailor-made for the special need of the regions. The connections with the three regional centres have mostly been established in collaboration with the local Agrarian Chambers, whose mission is to establish farmers marketing organisations, to support the business activities of its members, to promote and protect their interests and to cater for their needs. The Agrarian Chambers are entrusted with a part of the administration and organisation of the distance learning centres. Other non-governmental organisations which can help at national and local levels in organising visits, seminars and meetings and in providing materials and support useful for student' experiential learning and problem solving are also involved as necessary.

Academic links are established with other institutions in the Czech Republic in order to strengthen both teaching activities and student enrolment. Many students who apply for the MSc in PA & RD are graduates from these institutions and make up part of the flow of about 40 full-time students who enter the MSc program each year.

6.1.5 Outcome assessment

New curricula

According to the opinions expressed by both teachers and students in their interviews, a broader base of knowledge and practical approaches should be provided in order to comply with the aim to master the whole field of integrated and sustainable rural development. At the present time, the MSc degree course in PA & RD offers an appropriate specialisation on sectors like economics, law and sociology, but lacks an appropriate base for integrating the biophysical aspects of sustainable development. One solution to this problem envisaged at the Faculty of Economics and Management is to offer a new curriculum at the BSc level. This new curriculum branches out to other faculties and departments at CAU, which help the students obtain a more pluralistic perspective on rural development. Taking this initiative will lead to a more integrated approach to rural development within the larger educational system (BSc + MSc), that is to say a broader base of knowledge developed at the BSc level while maintaining the more specialised approach in economics, sociology and law at the MSc level.

Postgraduate options

After completing the master studies, CAU offers postgraduates doctoral (PhD) study courses that take three years in the following accredited fields: 1) Business Economics, 2) Management and Marketing, 3) System Engineering; 4) Business Administration; 5) Information Management, and 6) Regional and Social Development (following the MSc in PA & RD). The PhD degree is bestowed upon graduates after the completion of rigorous examinations and the submission of a doctoral dissertation.

Social outcomes

The integrated approach to rural development in the PA & RD MSc program is regarded as a key factor in the production of an educated and skilled labour force. These professionals are seen to be able to contribute to the removal of major weak points in Czech agriculture, that concern the lack of:

- Administrative staff able to tackle the challenges of rural development within the Czech Republic in view of European re-integration and the cultural reconstruction of a post-communist rural community;
- Investment in agricultural plants to achieve progress in removing the insufficient levels of welfare and hygiene standards;
- Improved competitiveness in the primary production and the processing industry to allow jobs to be maintained in rural areas;
- Investment in land consolidation to contribute to the settlement of ownership rights and the creation of a functional land markets;
- Support for the preparation and implementation of micro-regional development strategies with the participation of local inhabitants and businesses, including support for investment in infrastructures in rural areas;
- Support for the diversification of activities in rural areas to help reduce the high level of unemployment in rural areas and to stop the migration to urban areas;
- Support of agri-environmental farming in protected areas, as pilot projects to extend experiences in maintaining and increasing natural values of the environment.

6.1.6 Evaluation, feedback and further development

To evaluate student and teacher performances in the educational systems, questionnaires are a standard part of annual evaluations. Alumni also provide feedback on the structure and effectiveness of the MSc degree course. The alumni are concentrated in the AGRIA club, which is also an information source for agriculture. Each year there is a meeting of alumni and representatives of the faculty. In addition the accreditation process of the study programme by the governmental committee (Accreditation Committee of the Czech Government) offers more feedback. After the first approval in 1999, the programme is re-accredited from 2001 up to 2007.

Finally, an intricate virtual teaching and learning environment will have future implications for the MSc in Public Administration and Regional Management in that a) the staff will need special training to be able to use new ICT technologies and b) the technical and technological support will be strengthened by the creation of a virtual laboratory, with the use of Web CT and special supporting tools and hypertexts.

6.2 The MSc in Rural Development of University College Dublin, Ireland⁵

6.2.1 Description of the institution offering the programme/course

The institution is one of the major players in higher education in Ireland and has a strong involvement in agricultural education. The Masters in Rural Development is the first-degree programme in the department to deal explicitly with rural development. Since its inception a number of other undergraduate degree programmes have been developed with rural development components. Further, there are moves to establish cross-institutional degree programmes embracing a range of Irish institutions.

6.2.2 Key characteristics of the programme/course

The identified goals of the programme/course are to provide a) a cadre of change agents who can work with communities in rural Ireland and in developing countries and who can animate and facilitate bottom-up development, while recognising b) a need for both rural development from a multi-social sciences perspective (economics, sociology, business, marketing) and the need for 'professional skills' amongst the change agents.

The original goal has stood the test of time well and has certainly been invigorated and given a boost by the practices and experiences of EU Structural Funds and especially the one created for assisting rural development: the LEADER+ programme.

The course targets mid and early career professionals and end-on undergraduates with an interest in rural development work in Ireland, Europe in general or in developing countries.

There is no clear distinction between aims and objectives of the programme at an aggregate level (i.e. an overarching aim followed by quantifiable objectives), though the curriculum clearly indicates the purpose and content of the various modules. It is difficult, if not impossible, to articulate objectives at the programme level. For the Masters

⁵ This case study has been developed by ETIRD Team member Bill Slee in co-operation with Joe Mannion of the University College Dublin.

programme an honours degree in a relevant subject is required. However, senior staff is interested in values and motives and there is a possibility that a student with good motivation from a non-cognate discipline might be submitted to the programme. Individual course outlines are available, but the basic curriculum map is shown in Table 5.

COURSE	ALLOCATED CREDITS
I. Rural development	Total = 12
a. Economics of development	2
b. Sociology of development	3
c. Approaches and strategies to rural development	7
2. Enterprise Development	Total = 14
a. Project appraisal	1
b. Management and organisation	2
c. Financial analysis and planning	3
d. Basic marketing	3
e. Programme planning	5
3. Research Methods	Total = 10
4. Communications	Total = 12
5. Rural Tourism	Total = 10
6. Thesis	Total = 32

Table 5: Outline of the MSc in Rural Development of University College Dublin (Source: Programme handbook 2000-2001)

Insofar as there is a discernible theory, it is put into practice through a strongly case study based approach to learning. It is suspected that the theory is often implicit rather than explicit, especially with regard to rural development theory (that may well be because there is not a highly developed theory or bundle of theories regarding rural development).

Outcomes are usually measured by normal examinations and continuous assessments, though there is extensive use of group work.

6.2.3 Background of the integrated rural development programme/ course

The post-graduate programme in rural development has evolved out of an existing masters programme in agricultural extension for educating and training extension officers and administrators involved in agriculture. UCD is the principal organisation involved in in-service training with extension workers and administrators being seconded to UCD for skill enhancement. Because of the centrality of UCD in training extension workers in agriculture, the switch to training rural development workers (many of whom initially came from that background in Ireland) is a natural evolution. The Kellogg Foundation has made a substantial financial commitment to kick-start the programme, which began in 1987.

If there is a predominant ideology it is that there is a perceived distinctiveness of rural problems that demands special attention. The current ideology is that rural problems demand endogenous, 'bottom-up' solutions. The LEADER model (of partnership, local stakeholder involvement and participatory development) matches very closely the ideology of the programme. However, the ideology is implicit rather than explicit and is rooted in a general perception of what works and what is needed. In other words, it is not ideologically based; it is rooted in practice and experience.

The programme is largely needs driven. It is built around the perceived needs of extension workers and administrators, but in the 1980s there are cutbacks in extension services and there is at least an element of 'what else can we do?' that leads to an international/developing country strand being added to the course. Nonetheless it can still be argued that this is needs based.

The programme serves the needs of rural Ireland and the needs of developing countries, especially East Africa which has been the major recruitment ground and where many members of staff are engaged in projects. The external factors leading to change are the shift from a narrowly based conception of agricultural development to a more broadly based view of rural development, which occurred in Ireland very early compared to other parts of Europe. The farm population was haemorrhaging (over the last 15 years it has declined by 50%) and there was a perceived need to develop a much more entrepreneurial culture in rural Ireland which would provide for some kind of future to its rural areas.

The principal internal driver is the rationalisation that occurred in the extension service that led to a decline in numbers on the programme, which in turn triggered a more 'entrepreneurial' attitude amongst those

developing the course, and which eventually led to a broadening of the focus.

Two academics, Joe Mannion and Jim Phelan, within the extension department at UCD, are the prime movers of the initiative. The members of staff of the department have a long tradition of involvement in research/consultancy activity in practical rural development. Some of this work constitutes action learning; recent graduates are often involved and there is a consultancy unit within the department.

6.2.4 Key constraints in implementing the integrated rural development programme/course

Staffing: the development of the staff team has often been difficult due to lack of/insufficient funding from the University. Often staff are taken on by the consultancy unit for particular projects and then eventually kept on by the department, but this is not seen as a wholly satisfactory arrangement.

Research versus consultancy: in the developing ethos of the course, high-level academic research, as is increasingly sought by the institution, is not figured prominently. Instead, a hands-on consultancy approach prevails which may not deliver the requirements in terms of highlevel research output in refereed journals. There is recognition of these new centrally driven demands and action is being taken to enhance research capability. However, there may be a residual tension between the consultancy/practical research role and the more conventional 'academic research' output that is increasingly demanded by university management, and which drives intra- and inter-university funding by government.

Research versus teaching: the emphasis of the department is very much on creating an environment in which group learning> about rural development can take place. Until recently, there was little scope for academic promotion based on excellence in teaching and consultancy activity, which were the prevailing activities of the department. New promotion procedures now take into account research, teaching and 'contribution to the wider community,' the last being a field in which the department excels, but for which it had not been recognised within the university system. Renewal and reinvigoration: there is something of an age-gap between the junior staff and the senior professors. The senior professors argue a strong case for an open and inclusive approach that reaches out and listens to the wider community through seminars, professional and personal contacts etc. The more junior staff seem to think that there is a slightly complacent attitude which had led the department as a whole to 'take their eye off the ball' and as a result they have failed to recruit an ideal number of applicants to the Masters programme in the last couple of years. Also it is evident that the department is largely recruiting from its own research students leading to a self-reinforcing departmental culture. However, there is awareness of this, which recently resulted in an appointment from outside the department.

6.2.5 Key strategies used in implementing the integrated rural development programme/course

Bonding through group-work and seminars is utilised to create an inclusive learning environment. The case studies used in these bonding/learning exercises may be live or based on case studies, including videos. However, there may be a difference between the community development elements of the course which are taught more innovatively through group-work based case studies and the financial management and marketing areas which are taught more conventionally. Students comment on the rather tedious conventionally taught parts, which significantly contrast to the more invigorating group-work approaches of other parts of the programme.

The MSc in Rural Development is a flagship course but there are many developments 'in the pipeline' within the department that indicate a diversification strategy towards inter-institutional partnerships using a 'blackboard system' (a Penn State University system) and through diversification downwards into undergraduate programmes.

The strategy is one of carefully thought adaptation, including for example the decision to include options in the course to reflect changing demands from students and the employment market.

6.2.6 Evaluation and monitoring of the integrated rural development programme/course

Normal scrutiny is through the university system + external examination, although at an informal level there is a form of demand-driven evaluation whereby those involved in the course have very close involvement with ex-students in employment, which leads to much informal feedback and a constant reappraisal of what is being taught.

The extent to which the course managers are in touch with the rural development 'constituency' both in East Africa and in Ireland is a key feature of the programme. This provides a key test of relevance. There seems to be a good match between the anticipated and actual outcomes. Without a careful appraisal of training/educational needs of ex-students in post, it would be difficult to pick up any weaknesses in curriculum content.

Given the one-year nature of the programme, it would be rather difficult for the students to be able to shape and negotiate the contents. However, students are able to select options from other departments and students with particular interests are able to design at least part of their curriculum. Likewise the methods are largely established and range from some modules, which are group work based to others, which are more conventional. There is a significant difference in teaching styles between different elements of the programme.

6.2.7 Plans for development of the integrated rural development programme/course

Clearly there is a desire for the staff to maintain leadership in the field at the national level. However, there is now a clear strategy to pursue this through academic partnerships and new styles of distance-based learning, rather than 'doing it alone.'

Based on the observations made:

There is a need for a more shared learning culture across the different subject areas of the course as a whole. However, an argument against this might be an implicit recognition of the diversity of the nature of rural development, with both individualistic and collectivist components. However, the achievement of any one view is inevitably partly compromised by the desire to pull in modules from other departments, which may not share the same learning ethos and culture. It is thus necessary to balance the desire to allow students to customise course content to meet their aspirations and the desire of the department to create an all-embracing learning culture with a distinctive house style.

The institution management as a whole has been very tolerant of a teaching/consultancy oriented department (including special financial arrangements for a department-based consultancy), but there may be growing pressure to engage in research, which drives the department in different directions. A practical needs-based learning programme for post-graduates, undergraduates and junior practitioners may point staff towards different types of activity compared to a refereed publication-based appraisal approach, built on more formal research, which is becoming the norm.

There may be a tension between the desire to develop a 'community' focus to the programme and the desire to foster an individualistic entrepreneurial culture through the emphasis of part of the course on financial planning, marketing, etc. Although it can be argued legitimately that communities as a whole can engage in marketing themselves and there is scope for community entrepreneurship, the ethical basis of the programme learning is not always clear (i.e. is it individualist, mutualist or collectivist?). It is not clear whether community approaches to rural development necessarily foster and nurture individualistic entrepreneurialism or challenge it.

6.3 Titulación Superior en Desarrollo Rural (TSDR) of The University of Córdoba, Spain⁶

6.3.1 Introduction

This report is based on a visit to the University of Córdoba, Spain, on 6/7 March 2003. During that period several discussions are held with the leaders of the rural development courses, Professor Eduardo Ramos

⁶ Case study developed by ETIRD member Martyn Warren, Head of Land Use and Rural Management, University of Plymouth, UK in co-operation with Maria Mar Delgado and Eduardo Ramos of the University of Cordoba, Spain. We wish to acknowledge Eduardo Ramos and, particularly, Mar Delgado for contributing their (free) time for this study, for their open and frank responses, and for allowing access to their comprehensive report for UNESCO/FAO.

and Dr. Maria del Mar Delgado. Meetings are also held with Professor Andres Garcia-Roman, Vice-Rector for Academic Organisation of the University, and with students of the course. The study is also informed by a comprehensive report produced by the course team for UNESCO and FAO (Ramos and Delgado 2003).

During the case study visit all the students on the current TSDR course are met without lecturers being present. They are from a mixture of backgrounds, with first (5 year) degrees including Veterinary Science, Business, Social Work, and Agriculture. They are in the last few months of their two-year programme.

The course under study is the Rural Development Higher Academic Degree, or *Titulación Superior en Desarrollo Rural* (TSDR). This is equivalent to the fourth and fifth years of a five-year degree of the traditional European model, but offered as a stand-alone programme. The TSDR started in 1995 and then ran for three two-year cycles, end to end. It has been substantially revised during 2001 for implementation in 2001 to 2003. The course is part-time, designed for practising rural development professionals, and its current mode of operation involves attendance on Friday afternoons plus evenings and Saturday mornings, with students required to complete coursework in the intervening periods. Funding is from a combination of student fees and other regional and national funding (the course lies outside the government higher education funding system): each cohort comprises 15 to 20 students.

Two Masters' programmes developed from TSDR: the Master in Rural Development (MDRM) and the International Master in Rural Development (MIDR). The MRDM is designed specifically for managers of rural development in Local Action Groups in Andalusia: the first cycle started in 2000 and was supposed to finish at the turn of 2001/2002, but administrative issues (on the students' side) have delayed final completion. The MIDR is an extension of the TDSR, requiring a 6-month study period in a foreign university. A network of more than 20 European and South American universities, and which is situated in the European SOCRATES and ALFA programmes support this programme.

The University of Córdoba is situated in a region where agriculture has traditionally had a high economic and social importance. Formed in 1972

from the prestigious Higher Education Centre for Veterinary Science and the Higher School of Agronomy, its original mission is stated as 'a university with a strong agro-food and scientific vocation, committed to the development of its social environment' (Ramos & Delgado 2003: 16).

Spanish Higher Education in agriculture is currently based on the French *Grand Ecole* system. The officially recognised qualification is the five-year Agricultural Engineer degree, with a prescribed curriculum comprising a combination of agronomy and subjects typical of engineering. An individual centre has little flexibility in content and delivery method of the programme of study. Only such officially approved programmes receive funding from the Ministry of Education, though a number of alternative programmes, such as those under study here, operate without such funding.

In common with all rural regions of Europe, Andalusia enjoyed relative prosperity of the agricultural industry after the Second World War, which is further enhanced by the eventual accession to the European Union. The transformation of the government from an autocracy to a democracy during the 1980s resulted in a strong movement towards decentralisation, with substantial powers (and responsibilities) being delegated to regional governments. One result of the latter was an increase in the provision of higher education places as new regional universities were created. At the same time a number of factors, including a movement away from price support of agricultural products in European policy, were reducing the demand for agricultural graduates of the traditional kind. This in turn created a need for well-qualified professionals to manage the process of rural development, the new focus of policy of both the European Union and the region of Andalusia.

The combination of oversupply of graduates in production agriculture, and demand for graduates with expertise in integrated rural development, is a major influence on the creation of the rural development programmes in the University of Córdoba. Also important is the conviction of some University staff members of the relevance of rural changes, and their obligation to support that process. In this they are reflecting the University's commitment to serving the needs of society in Andalusia, and their proposals for change have been well received by some senior staff and governors.

6.3.2 Key characteristics of the programme/course

The *broad aim* is to enhance the capability of those already employed in leading positions in rural development, and to enable others to build on their specialist first degrees in order to obtain appropriate employment in the rural development field.

In achieving this aim, the students would be able to:

- Plan rural development at different levels, from the rural development groups to higher administration levels;
- Shift from a sectoral approach to a territorial approach in the different initiatives undertaken in the area;
- Integrate co-ordination of the different activities, in order to obtain complementarities and synergies;
- Promote sustainability at economical, social and environmental level;
- Encourage local people involvement in their future as a means of fostering the social and economic revitalisation of rural areas through the creation of activities, the reinforcing of competitiveness and the access to markets;
- Search for new opportunities based in an endogenous and bottom-up development; and
- Animate and train rural people as a means of improving local capacity building, empowerment, community leadership or governance. (Ramos & Delgado 2003: 22).

The guiding principles of curriculum design were:

- Multidisciplinary approach to both curriculum content and delivery (staff groups and student work teams);
- Internationalisation in both curriculum content and delivery (e.g. involvement of international experts); and
- Commitment to quality in curriculum content and delivery, in staff profile and in evaluation.

High emphasis is placed on flexibility, with the detail of subject content responding to changes in the rural environment: students are moreover allowed some opportunity for tailoring the curriculum to meet their own individual requirements.

The course structure for the first three student cohorts (1995-2001) comprises 180 credits, taught over two years. In this model, the learning

process is full-time, requiring daily attendance. Table 6 outlines the main components of the Rural Development Higher Academic Degree.

Teaching methods are participative wherever possible, using a combination of conventional lecture, 'conferences' (where expert specialists present ideas and engage in debate with students), and problem-oriented learning in workshops (where students work in multidisciplinary teams to tackle issues relevant to rural development). As well as specific skills, this process is intended to develop generic skills such as working in a multidisciplinary environment, acquiring group work techniques, using negotiation techniques, and reaching agreement or consensus.

Students also study live cases, and make field visits, which allow them to practise their skills and obtain practical experience.

	Economy of Rural Development	12 credits			
R	Sociology of Rural Development	6 credits			
E	Ecological Basis	9 credits			
1	Productive Basis (Livestock and Crops)	6 credits			
RS	Geographic Analysis	4 credits			
E	Countryside Management	11 credits			
	Optional Subjects	26 credits			
	FIELD WORK (12 credits)				
	Methods and Tools for Strategic Planning	12 credits			
~	Biological Production Systems	9 credits			
SECOND YEAR	Technologies	6 credits			
	Management of Strategies	9 credits			
	Public Policies	9 credits			
	Diversification of Activities	8 credits			
	Innovation and Transfer Techniques	6 credits			
	Rural Extension	3 credits			
	Optional Subjects	20 credits			
FINAL DISSERTATION (12 credits)					

Table 6: Outline of the Rural Development Higher Academic Degree of the University of Córdoba, Spain

Teaching staff: Two people who are crucial to the success of the programme are Professor Eduardo Ramos and Dr. Maria del Mar Delgado. Professor Ramos is Head of the Rural Development Research Group in the Department of Agricultural Economics; Dr. Delgado is a lecturer who has been for the last nine or ten years on a one-year renewable contract as a junior lecturer. They are supported by a small number of colleagues to form a core team. This is boosted by lecturers from elsewhere in the university and from outside the university, and the reputation of the course is now such that there are many actively requesting to be part of the process. The international reputation of the course is now so well positioned that guest lecturers from European and Latin American countries can frequently be incorporated into the programme.

Target audience: The maximum number of students in any one cohort is set at 25. Selection is by reference to both academic record and professional/research experience, and involves a personal interview. The typical age of students is around 30 year, and most already have a five-year undergraduate degree plus several years of experience. A small proportion (around 10%) has done just the first three years of their undergraduate qualification, and are thus still acquiring their first degree.

All students are doing the course while in full-time employment. All have the aim of getting into a career in Rural as a result of the course, widening their job opportunities considerably. The political and economic situation of the region (which has EU Objective 1 and LEADER inputs) means that rural development is well-recognised as an occupation, and that there are many opportunities available for well-qualified plus experienced people: public administration, consultancy, project management were all mentioned.

At least one has already found new employment through the course. They seem to have no doubt that the course will help them achieve their goals, and are very satisfied with it. The approach to learning is favourably compared with the more traditional methods ("200 people in one room, whereas there are only 18 of us") and it is pointed out that the flexible delivery is the only way they could combine it with employment.

Students are very enthusiastic about the input of Dr. Delgado, Prof. Ramos and the rest of the team. They are confident that they have sufficient opportunity to influence both content and delivery, via monthly meetings with the course leaders, as well as through more frequent informal meetings. In the process they feel able to comment on any matters relating to quality. The students are challenged to assess whether the course accomplished what it set out to do. The collective response is that "It depends on the individual effort of the student – whether he or she engages or not." It is felt to be particularly important that they have the discipline to do the 'homework,' and maintain contact through email and Internet.

Staff development: There is no specific plan for staff development. The core team develop their skills by maintaining close contact with rural development activities in the region, by attending international conferences, by international networking with academics and rural development practitioners. For the teaching of the programme, they select specialists who they regard as already having the attitudes and skills required for success within the course (which includes flexibility of approach, ability to relate their teaching to practical issues in rural development, professional credibility, and an absence of the traditional academic approach of 'professor teaches students'). They monitor this by attending class sessions and by frequent engagement with students in informal discussion about the course.

6.3.3 Background of the integrated rural development programme/ course

The idea for the programmes arose in the early 1990s from the involvement of a group of academics in developing a rural development plan at the request of the regional government. The plan was not implemented, but discussions within the group continued around the need for specific education and training in rural development, in order to help solve the rural problems of the region. A survey of potential employers of highlyskilled rural development specialists was conducted at European, national, regional and local levels: the results then formed the basis for interview and debates involving a wide range of academic, social, institutional and business agents. The outcome was confirmation of the need for rural development education: in addition the process was valuable in arousing interest of the various agents in the project. The results highlighted a need for a study programme based on comprehensive academic knowledge: although various vocational training programmes and short courses were available, there were no university-level studies available in Spain in this area.

The approach chosen is the establishment of a Second-Cycle Higher Education programme: Titulación Superior en Desarrollo Rural (TSDR) - in other words equivalent to the fourth and fifth years of a five-year degree, but taken by those who have already graduated from their first degree. One reason for taking this route, rather than that of a Master's degree, is to enable the programme to recruit graduates from a wide range of previous degrees. This avoids places being limited to, say, just holders of Agriculture Engineer degrees, while reflecting the multidisciplinary approach, which is felt to be appropriate to studies of, integrated rural development.

Thus the initiation of the course is demand-led, responding to very strong signals from regional agencies and government, rather than translating a particular philosophy of integrated rural development into a programme of study. This also applies to the aims and objectives of the course, and its content, which are influenced by the results of the survey.

The TSDR is the university's own degree, and not an official degree, in that it is not acknowledged or funded by the Ministry of Education. The Spanish Higher Education Ministry is not well funded, and only has enough to service 'official' degrees. The rural development course is a 'private' initiative, of one department rather than the whole university, and is thus regarded as being 'on the fringe.' This means that the people running the course have had to find all the resources for it, including classrooms, staff etc. All the funding comes via the students, partly from the students themselves (€ 1.500 per year) and partly from regional and national government funding (€ 1.500 per year). Given the small numbers (15 - 20) in each cohort, the financial survival of the course is inevitably dependent on cross-subsidisation from other university activities, and also on a form of cross-subsidisation by the individuals in the core team, who are totally committed to the project, and put a significant amount of their own time into the project. Recognition of the course by officials at various levels of government in the last two years means that it is possible that state funding will be available shortly and, better still in the eyes of the organisers, that the qualification is granted special recognition by the Ministry of Agriculture, Fisheries and Food, thus increasing the attractiveness of the course still further for potential rural development specialists.

Course leaders identify various supporting factors, which have helped them in developing the rural development programme (Ramos & Delgado 2003: 27, 49). The initiative comes from a small group of dedicated teachers who identify rural development education as crucial to the well-being of their region, and are prepared to commit their time and energy to it. In this they are supported by the university's Rural Development Research Group, which continues to play an active part in ongoing improvement. Teachers and researchers from various departments in the University of Córdoba, who bring a wide range of knowledge and experience to the programme, have supported the programme. The Vice-Chancellor of the University has been personally supportive since the inception of the programme, and the Deputy Vice-Chancellor of Academic Planning has given explicit institutional support. The latter oversees introduction of new degree systems, and thus is particularly important in this process: he was offered the position of academic leader of the programme at an early stage, and still holds that position.

Externally, the support of individuals and agencies engaged in rural development has been crucial to the development of the course. The proliferation of rural development strategies, and the introduction of Objective 1 Structural Funding and the LEADER programme, has helped to emphasise the importance of relevant education and training, and have created a source of employment for graduates of the programme.

6.3.4 Key constraints in implementing the integrated rural development programme/course

In common with most new academic initiatives, the introduction of the TSDR has met with resistance from various groups and individuals.

One source of resistance has been the farming sector, by which the change in emphasis from sectoral support of agricultural production to a territorial policy of rural development is seen as a threat to livelihoods of those in the industry. Rural development is often seen (usually erroneously) as competing for the same funds as production agriculture. Deep-rooted cultural attitudes also play a part, in that many see rural development programmes as denying them their identity as farmers, and trying to turn them into 'landscape gardeners' or 'hotel owners.' These perceptions are strongly rooted not only among farmers and agribusinesses, but also among civil servants, institutions and other agents concerned with administering agricultural policy. It also has its echoes among those engaged in provision of conventional agricultural engineer degrees within the university sector. By association, a higher education course that caters specifically for rural development (in the past a source of employment for agricultural engineers, despite the inadequacy of their training for such a role) is itself regarded as a threat to established interests on a wide front. Even institutions, which acknowledge the need for a properly trained force of rural development professionals, have often failed to provide appropriate support.

Within the university, the multi-disciplinarity, which is such a key feature of the programme, causes its own problems. Researchers typically identify themselves with single disciplines, and the lack of a single specific paradigm of rural development makes it more difficult for them to achieve peer recognition for their work (the crucial test). This makes many academics reluctant to engage with research or teaching in this area. New academic courses tend to build on existing subjects, and to be heavily influenced by the research interests of the staff involved, rather than respond to a market demand for an issue-led approach.

Also affected is the process of teaching and learning, and developing a truly integrated approach has been a challenge for an academic community with little previous experience of team-teaching. Encouraging applications from students of a wide range of conventional courses has posed further problems, as it is not possible to rely on a shared body of prior learning. This has had implications for the design and implementation of the curriculum.

At institutional level, despite the support of key senior individuals, the 'unofficial' status of the course has created various difficulties: for instance it took five years for the registration process to be incorporated in the central systems of the university, and until that time students had restricted access to libraries and university services, and were not able to pay fees by bankers order.

6.3.5 Evaluation and monitoring of the integrated rural development programme/course

At a local level, the performance of the course is measured by various means:

- monitoring student results (compared with previous cohorts and students on other courses);
- frequent direct contact with students, and seeking their opinions; and monitoring employment obtained by graduates.

The course leaders observe and evaluate sessions given by other lecturers, particularly if they are new to the programme. During the case study visit Dr. Delgado spent several hours briefing, observing and debriefing an external lecturer.

At university level, there is a process for evaluating official degrees, based mainly on peer evaluation of the teaching process – professors give reports, identifying strengths and weaknesses, and looking for ways of improving the weaknesses. As yet there is no system for unofficial degrees, but it is proposed that, in future, the process should be applied to both. The ratification of the Bologna Declaration will mean a more rigorous approach to quality assurance in the future, involving monitoring of quality indicators for all parts of the learning process. All degrees will be accredited, with additional Quality Certification for a few high-quality courses. Accreditation of degrees will be compulsory (it will be the bottom level of Quality Assurance), with additional Certification giving extra recognition to higher-quality courses.

During 2001 Prof. Ramos and Dr. Delgado come to the conclusion that, given critical feedback from students, a radical review of the course is necessary. A period of reflection leads to an analysis of strengths and weakness, and an objective assessment of the course, trying to be as self-critical as possible. Their conclusion is that they needed either to kill the course, or make significant changes. Deciding for the latter, they organise a debate, involving many people inside and outside the university, in a search for a new curriculum more suited to the needs of their target group of rural development practitioners. This is a departure from the usual professor-led approach to curriculum design: many professors back off because of this, but others who are more in sympathy with the process join in. At that time the 'managers' course (MRDM) is running concurrently with TSDR, and the change process is used as a focus for a problem-based learning assignment for students on this course, over a period of two months. The findings are used to inform the redesign process, helping to make the result more demanded and tailored to the needs of professionals.

The changes must be approved and implemented very rapidly, in order to apply to the 2001-3 cohorts. The support of senior management in the university, and particularly Professor Andres Garcia-Roman, Vice-Rector for Academic Planning has been crucial. The resulting course structure can be found in Table 7.

The difference of emphasis between this and the earlier design is very marked, moving from a theory-led structure towards a process-led structure (though still underpinned by theoretical considerations).

r			_		
ĺ	Rural Development Theories: Economical and Sociological	6 credits			
~	Territory Planning	6 credits			
	Natural Resources Planning and Management	6 credits			
AR	The Cycle of the Project I	12 credits			
E.	Quantitative and Qualitative Method of Analysis	6 credits			
FIRST	Participation and Network Analysis	12 credits			
	Geographic Information Systems	6 credits			
	Basic Legislation on Rural Development	3 credits			
	Public Financing on Rural Development	6 credits			
	The European Union Model of Rural Development	6 credits	1		
	Rural Development in a Global Perspective	6 credits			
FIE	LD WORK (12 credits)		_		
	Current Challenges of Agriculture	6 credits			
	Countryside Management	6 credits			
SECOND YEAR	The Territorial Approach	12 credits	ļ		
	Innovation, Quality and Competitiveness	9 credits			
	Valorisation of Endogenous Resources	6 credits			
	Sustainable Development	6 credits			
	Human Resources Management	6 credits			
	Case Method	6 credits			
	Business Development	6 credits			
	Rural Tourism	6 credits			
	The Cycle of the Project II	12 credits			
FINAL DISSERTATION (12 credits)					

Table 7: Revised outline of the Rural Development Higher Academic Degree of the University of Córdoba, Spain

Some basic subjects have been trimmed, others deleted on the grounds that they can be studied in other degree courses, while more applied subjects have taken their place. As well as reflecting informed opinion from students and practitioners, the new course design accommodates advances in applied research and the increased availability of relevant learning materials since the inception of the course 6 years previously. It also benefits from the increasingly international outlook of the Rural Development Research Group, and its affiliation to a network of European and South American universities, enabling frequent participation of visiting lecturers:

It is at this point that the daily attendance is changed to its present pattern of 15-hour blocks on alternate weekends, from Friday afternoon to Saturday lunchtime, plus occasional field visits. Each block takes the form of a workshop focussed on a specific issue, with a mixture of lecture/seminar presentation and problem-based learning with students working in multi-disciplinary groups. A semi-distance approach is taken, using electronic communications and multi-media materials, to allow the students to learn from home during the week. This enables students to combine work and/or family roles with their studies, although this requires considerable determination. Each student has a personal tutor who is readily accessible by email or telephone.

6.3.6 Plans for development of the integrated rural development programme/course

It appears that, eight years on, considerable progress has been made in overcoming the difficulties mentioned above. Although resistance to change is still deep-rooted in agricultural society, the growth in importance of rural development funding, boosted by Agenda 2000, and coupled with institutional reorientation, have helped to change attitudes externally.

Internally, a major influence on attitudes has been the success of the programme itself. The course team has been able to demonstrate that it is possible to combine a demand-led, multidisciplinary course, incorporating a mixture of learning methods, with academic rigour. The contribution of teachers from various parts of the university has undoubtedly helped to spread this message through the institution. Furthermore, the three cohorts of students who have so far graduated from the course have secured good employment and have achieved 'outstanding performance in their respective work' (Ramos & Delgado, 2003: 32). The international recognition which the programme & the Rural Development Research Group has achieved reflects well on the University, and has gone some way in changing attitudes within the university staff and its governing body.

The team recognises the importance of continued development and innovation. They are working to adapt the degree to a Master's qualification according with the Bologna agreement, and it is likely that this will be a pilot at national level. This will carry with it the important benefit of being officially recognised by the Ministry of Education.

Other plans include the development of a European Master with a network of five or six European universities, and the presentation of a proposal to the Erasmus World programme with European and Latin American universities. In the medium term, the team hopes to be able to organise a fully on-line system for delivery of the course.

6.3.7 Conclusions

Given the time constraints in conducting this case study, assessment of the TDSR course relies more on experienced subjective judgement than on objective performance measures. With that caveat, there is little doubt that the programme is fulfilling a valuable role in the process of rural development in Andalusia and beyond, and is highly regarded by the current students. The dedication and enthusiasm of the core team members is admirable, and they have acted as the catalyst for creation of a wider group of academics within the University of Córdoba, committed both to a multidisciplinary approach to rural development, and to the use of a wide range of learning methods appropriate to both the area of study and to the students' circumstances. The course has undoubtedly been influential in changing attitudes in professional circles and within the university itself.

While it is impossible to reduce this success story to a simple formula, certain key points arise:

- The need for specialist education is recognised at an early stage.
- A key to this recognition is the cultivation of networks of individuals and organisations engaged in the process of rural development.

- These networks have been expanded over time, and now extend internationally. As such, they supply valuable ongoing support for the course, and provide the course team with frequent 'reality checks' on the validity of the programme.
- The programme is designed for purpose, aimed at serving the needs of rural development professionals rather than the interests and prejudices of academic staff.
- The course team is sensitive to student opinion about the programme and the way in which it is delivered, and is prepared to take radical action as a result of what it learns.
- Despite being committed to a demand-led approach, the course team has been able to show that this need not mean a loss of academic rigour in teaching or research although it might be harder work for academics to achieve this than a narrow discipline-based method.
- The time needed to change entrenched attitudes should not be underestimated: the problems faced by this course team at all levels are replicated across Europe, if not the world, and need considerable stamina, patience and diplomacy to overcome.

The clearest conclusion from this case study is that the success of the programme – from recognition of need, through curriculum design and delivery, to achieving national and international recognition – arises primarily from the initiative and sheer hard work of a small core teaching team, a key member of which is still on an annually-renewed contract after nine years. It is to be hoped that they and their course gain the official recognition they deserve from their university before the course reaches its tenth birthday.

6.4 Degree Course in Ecological Agriculture, University of Tuscia, Viterbo, Italy⁷

6.4.1 Description of the institution offering the programme/course Tuscia University is a relatively young university in Italy and its Faculty of Agriculture is one of 15 in Italy but the first one in the Lazio region.

⁷ Case study developed by ETIRD-member Nadarajah Sriskandarajah of the Royal Danish University of Agriculture in co-operation with Prof. Fabio Caporali of the University of Viterbo.

The mainstay of this Faculty has been a five-year degree programme in Agricultural Science and Technology with two options for specialisation: Management of Agricultural Resources and Plant Production and Protection. The emphasis given to plant production is a reflection of the significance of the cropping sector in the region, particularly cereals, vegetables and fruit crops. The new degree programme in Ecological Agriculture (EA), introduced two years ago, emerged due to the convergence of several factors, some internal and others external.

Of the 10 new course offerings approved and implemented by the Faculty of Agriculture, the Department of Crop Science is responsible for two: the degree in Ecological Agriculture and a degree in Agricultural Crop Production and Protection. There are currently three cohorts of students following the programme, with a class of 19 students in the first year cohort of 2001-02. This also means that when the case study is compiled none has graduated from the programme.

Organic farming, which emerges as an alternative to conventional agriculture in the 1980s in Europe, has as its ideology and practice an emphasis on sustainability, human health, biological conservation and quality of life for farmers. The way in which academic institutions have incorporated this change in farming practice, and in society in general, is through the adoption of new words. The term 'agro-ecology' came to be used in some instances and the phrase 'ecological agriculture' in other instances to symbolise 'organic farming.'

The university is a member of the European Working Group on joint curriculum development within the field of agro-ecology. The degree is one of only three independent degree programmes offered in this field in Europe. The other two are at the University of Wales, Aberystwyth (in English) and the University of Kassel, Witzenhausen (in German). While the number of institutions offering courses and programs in this field is growing, the partnership among the original Socrates group of institutions is strong with a flow of staff and students among them and on-going joint development of curriculum. In addition to Viterbo and the two institutions named above, KVL, the Danish Veterinary and Agricultural University and Wageningen University are also members of this partnership. In July 2000, the summer component of the Socrates joint programme was hosted at Viterbo.

6.4.2 Key characteristics of the programme/course

The specific objectives of the programme are to:

- develop an appreciation of farming as an occupation oriented towards eco-compatibility;
- acquire the ability to organise farming as a harmonious expression of human needs;
- learn how to organise farming system components in a coherent agro-food system which embraces solidarity and employment at local and global level;
- develop skills required to plan agro-ecosystems on different scales with the chief objective of sustainability; and
- be aware of the economic and management aspects of agro-ecosystems compatible with the environment through contact with agricultural enterprises farming organic products.

In addition to these, the programme also aims to serve regional needs, both in terms of meeting farmers' needs and in reaching out to local students for university study. Promoting international mobility of students across the EU is another of the goals of the programme.

The three-year Bachelor programme is offered through 3 teaching terms each year, made up of 60 credits (ECTS) per year or 180 credit points for the whole degree. The first half of the programme consists of basic disciplines and principles of agriculture while the second half has units most of which are specially designed with an emphasis on EA or organic farming. These latter units are open to students in other programmes as well. A list of courses can be found in Table 8.

A special feature of the new programme is the Work Traineeship experience, distributed over the three years. Students become engaged with practicing farmers, with 10 out of 180 credits being allotted to this activity spread over four terms. The final thesis, which may involve a project connected with this traineeship, has been allotted another 5 credits. The aim of this unit is to bring students closer to farming practice, help them experience and deal with real problems faced by farmers and to think about all possibilities as solutions in an interdisciplinary manner. Students work with organic farmers approved by the University, visit the enterprise several times, continue to work on problems associated with the same fields over different seasons in close consultation with their tutors and finally present their findings to the class and teachers.

Te	rm Subject (Credits	Term	Subject	Credits
<u></u>	P st Year		j	2 nd Year	
1 st	Mathematics	6	4 th		
1 st	General & Organic	8	4 th	Soil Management as Biologi	cal 5
	Chemistry		5	Resource	
1 st	Foreign Language	6	4 th	Fundaments of Engineering	9
	-		4 th	Eco-compatible Techniques a	and 5
			-	Mechanisation	
2 nd	Agricultural Genetics	6		Placement	1
2 nd	Physics	6	5 th	Fundaments of Agronomy ar	d 9
			1	Crop Production	
2 nd	Formative activity	5	5 th	Fundaments of Animal	8
(stu	dent's choice)			Husbandry	
2 nd	Placement	2	5 th	Placement	3
				Energy Flow and Food in	5
				Eco-compatible Agricultural	-
				Systems	
3rd	Agricultural Botany	6	6 th	The Principles of Organic	9
]	- g,	-	-	Cropping System Design and	1
				Management	
214	Agricultural Ecology	6		Human Health, Nutrition and	,
ľ	. B. 10		1	Food Quality	-
2rd	Fundaments of Agricultura	1 9	ļ	Economical and Social Imna	cts
ľ	Fconomics		Summer	of Ecological Agriculture	
	Leonomies			Historical Evolution and	6
			course	Philosophy of Ecological	Ŷ
				Agriculture	
	3rd Year				
7th	Planning and Management	tof			
	Organic Animal Husbandr	v 10			
7 th	Decision-making in		ļ		
	Ecological Agriculture	6			
71h	Environmental Impact and	l			
	Enhancement in Ecologica	1]		
	Agriculture	4			
8 th	Ecological Agriculture		ĺ		
	as Business	6	[
8 th	Statistics and Informatics	-			
ľ	Laboratory	4			
8th	Formative Activity				
	(Student's Choice)	6			
8 th	Placement	4			
ł					
9 th	Fundaments of Plant prote	ction 9			
9th	Pest-control in Ecological				
	Agriculture	5			
9 th	Formative Activity				
	(Student's Choice)	1	Table 8	8: Course contents of the tl	aree-
9th	Final Exam	5	vear h	achelor in Feological Agrid	alters
	Total Credits	180	y ar b	TITE I AM I	andiç
L			i at The	University of Tuscia	

Assessment of courses is predominantly through written examinations, practicals and quizzes. Discussion of projects and reports and oral examinations are also included where appropriate, such as in the assessment of the work traineeship programme. Other assessment options are also now being considered.

English is being taught as an important element of the programme especially in view of the emphasis on international mobility.

6.4.3 Background of the integrated rural development programme/ course

In the context of this course, Ecological Agriculture (EA) is taken to constitute agriculture as a human activity system oriented towards ecocompatibility. Farming is viewed as a harmonious expression of the many human needs. In this sense, rural development is seen as a process with a series of aims that need to be balanced within the context of ecological agriculture, these aims having to be understood primarily as biophysical processes which are influenced by economic, technological, social and political factors. EA offers the potential to design an efficient web of human activities which are able to re-vitalise local and regional economies through a quality-oriented development.

The original five-year degree programme built to support the region's agriculture had to be adjusted to comply with several external and internal events and changes. In the external scene, there has been a perceptible shift in farming practice from long established and dominant systems of monocultural cropping to a more diverse and rotational system of crop farming. The demand from the public for chemical free food and the push coming from Agenda 21 for development of environmentally compatible agricultural systems has seen the growth of the organic farming sector in Italy. It is felt that the University of Tuscia, as a young university with a young faculty, is uniquely placed to meet society's new demands on it.

Other external factors that contribute to this change are:

 Participation in the EU's Socrates/Erasmus programme towards a common European degree in Ecological Agriculture, and the push coming from this programme for joint curriculum development in EA;

- Internationalisation Program of the Italian Ministry of Education, which allowed access to funds; and
- Financial support from the Regional Agency for the Learning Right of students.

Prominent among the internal factors is the requirement of the University to restructure its curriculum according to the 1999 Bologna declaration and to harmonise it with EU directives into a 3 + 2 structure. The University of Tuscia also has, as part of its mission statement, the requirement to adhere to the Magna Carta principles. The personal involvement and push from some of the professors in the field of EA has been an important driver for the start of the programme, particularly the part played by Professor Fabio Caporali as the main promoter of the programme and its co-ordinator.

6.4.4 Key constraints in implementing the integrated rural development programme/course

Students with a rural upbringing have an advantage over metropolitan students, such as those coming from Rome, in that they possess some of the necessary skills and the capacity to relate to farmers. This aspect of the programme is still in its infancy and like most innovative approaches to education, it is evidently a challenge for both students and tutors. It demands more resources than traditional classroom teaching and transport of students from the university to farmers' fields poses specific difficulties.

6.4.5 Key strategies used in implementing the integrated rural development programme/course

The range and mix of competencies expected of agronomists are such that, higher education in agriculture in Latin countries has generally moved towards specialisation and multiplication into many independent courses within each programme. The case of EA seems to be an exception to this trend in that there has been integration leading to reduction in the total number of courses in agronomy.

The theme of EA with its ideology of holism and integration is reflected in the course content and design. Furthermore, the programme is being co-ordinated on a more thematic basis than has been usual. There seems to be a good mix of students from the local area and those from the wider region. Students on the whole seem to be motivated and some of them are explicit in their commitment towards ecological concerns and the ideology of organic farming. There are even a few that abandoned other fields of study in other institutions in order to take this programme. Students often comment on the success of the international links, for example, the Erasmus programme. Students who experienced the older programme at Viterbo comment on the choices available to them now in terms of courses. They also feel that courses are better organised now than before due to the opportunities teachers have for rethinking their offerings.

There is evidence of an adequate research and publication base to support education in EA. However, not all members of faculty are engaged in research pertaining to the needs and ideals of EA. Students note that some of the teachers are interdisciplinary in their practice, both in research and teaching, and work within the field of EA. There are others, it is noted by students, whose research practice does not necessarily overlap with the ideals of EA. Likewise, there are also observations about the tension between the level of depth characteristic of teachers who are specialists and the breadth of coverage offered by those who tend to be generalists.

Evaluation of courses is being undertaken by the use of standardised university wide questionnaire.

6.4.6 Plans for development of the integrated rural development programme/course

The programme has been going for three years and when the case study was being compiled, no graduates had been produced. Students are in their 1st, 2nd and 3rd years at present. Graduates in the old programmes have in the past been employed traditionally as technical specialists. It is too early to evaluate the employment potential of graduates of the EA programme. It is expected that most will continue on to the next level of the 3 + 2 model.

The organic farming sector is expected to grow in Italy. The nature of the problems experienced and the large regional differences in Italian agriculture are considered to be unique. This implies that the demand for graduates to serve EA and rural development will continue to rise. In terms of being integrated with local needs, the programmes in Viterbo seem to be linked well to the community. The work traineeship programme, for example, is rated as successful with committed farmers in the community working with the University.

The active involvement of and the push provided by Professor Fabio Caporali, the international network in EA and the need of a young, innovative university with a younger teaching faculty have enabled the creation of the new programme in Viterbo. The programme could be better marketed than what is being done at present. There is some local recruitment being undertaken in the region but this could be improved. In the words of one teacher 'the future of the course depends on the teachers and their commitment.'

7 STEPPING STONES FOR CURRICULUM DEVELOPMENT

7.1 Curriculum change between pragmatism and change of ideology

One of the key observations that the four cases featured in this book seem to share is that highly motivated and dedicated people are the main driving force in curriculum change. They are engaged in such change for a number of reasons, amongst which the desire to produce graduates who can work in the new rural economy, with its post-productionist demands and its stronger environmental concerns, is a very important one. There are important differences of a personal nature (epistemological vantage point, personal values, personal experiences and social networks), and of more contextual nature (rural history of the region, rural policy, local economic outlook and trends, links or lack thereof between tertiary education and the rural communities), that lead to different institutional responses to the challenge of designing education for IRD.

There are also differences in the way 'change' is conceptualised by the various actors involved in curriculum response to a changing world. Some lean towards a radical transformation of ideology of teaching and learning and equate 'integration' with the inclusion of systemic thinking, holism and transformative learning. Others, perhaps more pragmatically, opt for a more adaptive and conservative approach and prefer to renew existing courses, improve links with the community and integrate emerging concepts, while discarding old ones that have become fruitless. In the cases covered in this book, but also in the responses to the on-line survey, a whole range of approaches to teaching and learning can be found, often closely related to a particular view of what constitutes 'knowledge,' 'research' and 'curriculum.' Some stress the importance of preparing students to be competent and skilful workers with a healthy work ethic (tendency towards a vocational/neo-classic orientation). Again, others stress the importance of equipping students with the competences and skills that help them succeed in a competitive, globalising market-oriented world (tendency towards a *liberal/progressive* orientation of curriculum development). There are also those who stress the importance of engaging students in critical thinking, action taking and helping them cope with uncertain futures and every changing realities (a tendency towards a socially critical orientation of curriculum development). Table 9 shows three different perspectives on teaching, learning and research that in reality might not be as clear-cut as presented here.

The epistemological paradigm shift towards a systems perspective, which will be highlighted in this closing chapter, is a strong influence in some cases, but certainly not in all cases. Many involved in curriculum development have simply sought vocational sensitivity, which has required new courses, without advocating a paradigm shift. The courses and degree programmes that we examined are a manifestation of this practical response as well as of new thinking. In practice we see a mixture of giant leaps and small steps. Such changes, big and small, are often a function of changing values, interests, perceptions and experiences of people active in further and higher education.

[Scientia	Techne	Praxis
Focus	Learning for knowing	Learning for doing	Learning for being
Knowledge produced	Propositional	Practical	Experiential
Stucture	Subject disciplines	Crafts/Skills	Issues/
			Competences
Teacher's role	Expert	Master	Facilitator
Teaching strategies	Lectures on theory	Practical instruction	Real-world
		Demonstrations	Projects
Research style	Basic (Experimental)	Applied	Action
		(Developmental)	(Participative)
Research goals	Abstract-universal	Workplace	Contextual
_	knowledge	Solutions	knowledge /
			Action for change
Basic philosophy	Positivism	Utilitarianism	Constructivism
Focus of reflection	What do I	What can I	Who am I
	now know?	now do?	becoming?

Table 9 Some distinctions between different traditions of knowledge and knowing (Adapted from: Bawden & Macadam, 1991, p. 4)

Here we bring together some of the lessons learnt from our engagement with the literature, the practical case studies, and with each other and others during workshops and seminars. A significant part of this closing section comes from a presentation one of us, Fabio Caporali, made at the ETIRD workshop at the 16th European Seminar on Extension Education which was held in Hungary in September of 2003. In this part some of the barriers of adopting an integrated approach to curriculum development are discussed. These barriers include the deeply entrenched patterns of reductionist and disciplinary thinking that characterise so many institutions of 'higher' education. A systems framework is offered as a way out of these unproductive and, ultimately, irreversible and destructive processes.

A systems perspective on curriculum change as a means for accommodating more integrative approaches to teaching and learning (process) and rural development (content), perhaps does not fully reflect the gradual. messy, stuttering process that more accurately reflects how, in most cases, progress in curriculum design in IRD moves forward. In some cases there are significant key events that may trigger curriculum change, for instance, when new powerful or inspiring (or both) personalities engage in curriculum development, or when a new European Policy on Higher Education becomes effective (for instance the introduction of a European Bachelor-Master structure and the European wide introduction of the ECTS-system), or when a decline in student numbers require a major overhaul of existing programmes. Hence, the turn to a systems approach and the need for an alternative ontology/epistemology that emerges out of the four case studies should not be seen as a prescription but rather as a critical consideration that might be considered along with others. One of those, present in all four cases covered, is a very pragmatic one driven by the current socio-cultural and economic reality that many rural area's in Europe are currently facing. It can be argued that in economic, social and cultural terms the 'old rural,' made up by the occupational community of those working the land, has been supplanted by a 'new rural' with businesses not necessarily connected directly to the land (i.e. tourism and other services, which are part of rural development and need to be integrated into a new consumption-oriented approach to RD). In some areas, this trend is enhanced by a growing new rural population alongside a declining farm population. It should be no surprise that many higher agricultural education institutions respond to these trends
by creating new courses and programmes that address these changes without necessarily re-thinking their educational philosophy. It is with this in mind that we introduce a systems perspective as one of the stepping-stones for curriculum development.

7.2 Barriers to integration in curriculum development: a systems perspective

Curricula are "learning systems" representing the real systems, physical or abstract, to which they refer (Figure 5). The first aspect of systems integration concerns the correspondence between the representation system (curriculum) and what is represented (real system), which is essentially an ontological and epistemological matter. A lot of criticism of the structure and functioning of curricula in Western universities has arisen in the last decade. One particularly strong critique focused on the lack of connections to contemporary reality. Even when such connections are made, it is in such a fragmented form that little useful understanding is possible (Daly & Cobb, 1994). The current status of curriculum development has been well summarised by Malon (1990) with these words: "What we teach is fragmented. We teach what we understand, and universities reflect an outmoded understanding." However, it is crucial that a curriculum is a good representation or model of reality since it inevitably begins to function as a norm to which reality is made to conform by the very policies derived from the model.



Figure 5: Curriculum development in Western Universities under the dominant paradigms

Strangely enough, reality can, eventually, converge towards the model that tried to represent it in the first place. The model then becomes a self-fulfilling prophecy. Daly & Cobb (1994) have made a meaningful contribution in order to highlight what kind of theory and praxis is behind curriculum development in Western – but also in many Eastern European – universities (Figure 6). They created the term "disciplinolatry" to refer to the process of the disciplinary organisation of knowledge. This disciplinary organisation of knowledge penetrates forcefully the modern university and through it contemporary society as a whole.



Figure 6: Curriculum development in Western Universities under the emergent systems paradigm

The disciplinary "successes" have involved high levels of abstraction resulting in deductive conclusions, which are generalised to the real world with little awareness of the dangerous consequences of doing so. This kind of organisation of knowledge and its implications were anticipated early in the past century by Alfred North Whitehead who labelled the outcome of the whole process: "the fallacy of misplaced concreteness". Signs of this fallacy are shown in the economic paradigm that dominates our current unsustainable development (see also Part I of this volume). For instance, the strongly cultivated appeal of "material externalities" occurs at the expense of other more internally driven experiences. This points at the problem of misplaced concreteness in economic theory. The fallacy of misplaced concreteness culminates in "money fetishism," which consists in taking the characteristics of the abstract symbol or measure of exchange value, money, and applying them to the concrete use value, the commodity itself. With the advent of a money economy, the most tragic human paradox has been accomplished: virtual wealth can be indefinitely accumulated in the form of money, whereas real wealth in the form of bio-physical, non-material, richness and earth habitability can be increasingly destroyed. The characteristics of the abstract symbol (non-spoilage) come to dominate the characteristics (spoilage) of the concrete reality being symbolised (Daly & Cobb, 1994).

Another barrier to integration in curriculum development is provided by the university research structures, which contribute to re-enforce disciplinary-oriented learning. Departments are designed to foster knowledge within their discipline, and their reputation and resources flow from recognition within their field. Most research is conducted within the established boundaries of a given discipline. Traditional doctoral programmes, which open access to academic careers, have evolved in a way that strongly encourages specialisation (Golde & Gallagher, 1999). As a consequence, the classical organisation of university research into discrete and specialised departments provides neither the perspectives nor the tools to deal with reality, let alone to (re)design and improve it (Francis et al., 2001).

7.3 A systems perspective for Integrated Rural Development Curricula

Rethinking the curriculum means discussing the changes in teaching, learning and instruction that are needed to better link the academic world to today's global realities. According to a survey of the agriculture teaching programmes of related universities in Europe (Phillips, 1999), most graduates felt that their exposure to relevant practical experience was lacking, as was their training experiences in the environmental aspects of agriculture. To overcome the growing mismatch between the requirements of the curriculum and the realities of life, it is necessary to develop new epistemological, ontological and methodological tools in order to give a more coherent view of knowledge and more authentic and meaningful view of life. These new intellectual and organisational tools will help in the challenge to better understand reality.

One of the most powerful examples of an integrative approach is the systems paradigm, which calls for a change from a discipline to a systems focus. To explain the structure of reality, the processes involved, and the role of humankind in these structures and processes, the use of a holistic type of instrument called "systems thinking" has been suggested (Boulding, 1956; Checkland, 1981). The systems field is predicated upon the belief that reality is a unified whole. Historically, the term and the philosophy of holism was originally developed by Smut (1927) and scientifically elaborated by Tansley (1935) who used the concept of ecosystem of which people and their activities are fully part. Dating back to the first formulations of this concept (Tansley, 1935), human activity finds its space in ecology as an extremely powerful biotic factor that tends to increasingly disturb the balance of preexisting ecosystems and in the end destroy them. The systems paradigm spotlights the deeper pattern which connect all phenomena and proposes that diverse aspects of reality – physical, biological, social and technological – can be better understood and handled when treated as systems of interdependent parts that interact with their environments.

Curricula based on a systems paradigm offer an educational process more appropriate for an era of limits. The interpretation of our planet as the ultimate global ecosystem requires an acceptance of natural limits to human activities and serves to instil a context culture, where a sense of belonging and responsibility for sustainable development are promoted. Curricula designed to foster social and environmental interdependence have more chances to offer students multiple opportunities to experience learning within the context of their neighbourhoods so that the acquisition of important skills and knowledge is not de-contextualised but embedded in a process of shared existence. Knowledge of local cultural traditions and sense of affinity with the regional environment help prepare students to take an active role in the care and governance of their communities once they have graduated (Smith, 1993).

Global problems are systemic (Malone, 1990). Education for global problems demands an understanding of the underlying ethical attitude of our activities. One of the most critical challenges in restructuring natural science dominated curricula is incorporating ethical and aesthetical dimensions of learning. The centrality of values (like sustainability) emerges in a curriculum based on a systems approach. Values are not a separate category of the mind, but arise out of a comprehensive understanding of reality, our worldview (Clark & Wawrytko, 1990). The sense of good and the sense of beauty are part of our human dimension. The ontological assumptions derived from the ecosystem concept that all life forms are inextricably connected (religion of connectedness) in a finite and beautiful planet calls for the urgent need to protect the ecosystem of which we are part, by assuring sustainability of our human activity systems. Universities and schools have a responsibility in reexamining current perceptions of nature, of the world and of human society in the light of the reality of resource depletion (see also Corcoran & Wals, 2004). They have a responsibility to (re)develop curricula and structures to help students deal with a world of limits rather than a world of expansion and growth (Smith, 1993).

7.4 Methodological tools

Traditional methodologies inspired by a mono-disciplinary curriculum structure tend to foster in learners a fragmented view of reality because their main focus is success (e.g. passing an exam or getting a proficiency certificate) in separate fields of learning. Learners find it very difficult to integrate de-contextualised and unrelated knowledge and skills to resolve real-life issues. Methodological tools inspired by the systems paradigm can be helpful in improving connections between a curriculum as a whole, its external context, and within the curriculum components themselves (internal tools). External methodological tools help to introduce a broad concept of teaching and action-based learning. Integrating the expertise of farmers, business owners, government specialists, and non-profit groups can enrich the educational process by offering different perspectives and ways of knowing (Francis et al., 2001). Moving students into the discovery made through case studies engages their multiple senses when they become immersed in the realworld context in which learning takes place. Case studies, interview and survey techniques, time-series measurements, and activity calendars can be taught and applied to answer questions about integration within the whole agro-ecosystem hierarchy (cropping systems - farming systems - regional systems - global systems). These approaches require several changes in attitude and organisation. New sources of funding and revised systems of administering research funds will be required to promote this approach successfully (Stark, 1995).

Tools are also needed in order to give more internal coherence to a curriculum. This requires more integration of the disciplines. Thus, all levels of approaches to integration (multi-disciplinarity, inter-disciplinarity and trans-disciplinarity) are probably needed. Multi-disciplinarity generally means bringing separate theories, skills, data and idea to bear on a common problem, while inter-disciplinarity involves bringing together people and ideas from different disciplines, to jointly frame a problem, agree on a methodological approach, and analyse the data (Golde & Gallagher, 1999; Hammer & Soderqvist, 2001) Finally, transdisciplinarity implies full interaction between disciplines from an issuebased perspective. According to Hammer & Soderqvist (2001), integrative approaches could be addressed in course programmes in several ways, including:

- 1 inviting external lecturers from other disciplines;
- 2 having seminar exercises and discussions with invited lectures from other disciplines;
- 3 mixing students from ongoing disciplinary courses for joint exercises; and
- 4 offering full trans-disciplinary courses and programmes.

The efforts in this list range from the most basic (1) to the most completely integrative (4). Although the latter type of effort is desirable in many respects, it is likely to require relatively well-developed and integration-oriented organisational structures, such as interfaculty degree courses or courses/modules.

More internal coherence also requires more integration between teachers and students, who are the basic components of a curriculum-based learning system. Creating a truly integrated curriculum entails that the two groups become reciprocal members of a shared, self-critical learning community. This can be achieved through:

- creating a community (amongst learners and/or teacher learners) that generates conversation (i.e. including such techniques as having members talk in turn to create knowledge through a process of continual negotiation and transformation);
- creating a team-teaching context. Team-teaching is an excellent way to move away from the individualistic and disciplinary mode of scholarship and research. Members of teams composed of faculty from different disciplines, often find their intellectual life more enriched (Manley & Ware, 1990). A team-taught course can be a vastly rewarding experience for both students and instructors; and
- · implementing intensive programmes or courses that are not longer

than two weeks (6 ECTS) in order to create more flexible didactic arrangements for approaching different contextual experiences.

7.5 Conclusions

Among the human activity systems, agriculture and forestry are perhaps the most integrated, since they combine in organised systems or farms bio-physical and socio-economic components from both natural and anthropogenic sources. A sustainable integration is demanded in today's rural land using activities at any hierarchical level, from the local to the regional and global levels. The concept of Integrated Rural Development has been created to revitalise the rural environment and economy without compromising the Earth's life support systems. University has an important role to play in society by educating professionals in agriculture to help them meet the current expectations and demands. New epistemological, ontological and methodological tools based on a systems paradigm could help universities address the challenge of establishing new curricula for sustainable rural development. At the same time, society as a whole must find the right way of supporting universities in this task so that it can play its role in a learning society.

In our cases we found diversity in innovation. In addition to the epistemological "Gestalt switch" towards a systems orientation, we also found a kind of Darwinian adaptation process as institutions, and more importantly individuals, sought to survive and adapt what they had done in order to attune it more closely to contemporary demands. The resistance of the old guard is widespread. It is evident in many of the cases, as is the tendency for mono-disciplinary scientists to look down their noses at the efforts to build inter-disciplinarity.

There are some profound and unresolved paradoxes, not least the growing tension between institutional research excellence and relevance to the wider needs of rural society. This pushes inter-disciplinarity and new courses to the margins and makes their establishment and financing difficult in many cases. New universities seem to have the edge because they tend to be more closely connected to their client base and less ivory-towered than the old Ivy League type establishments. It might help to have a systems perspective – as has been outlined here – but it is still possible to develop an IRD-oriented curriculum without it. Nonetheless the cases and the on-line survey results do show a strong drift towards a systems-type approach as programmes are evolving. Sometimes this systems perspective is explicit and sometimes it is not.

Across the board introducing IRD in the curriculum has been a struggle and will remain so as long as universities are judged on their traditional outputs in terms of narrow disciplinary research excellence. It is also paradoxical that agricultural institutions designed to be vocationally sensitive have been so critical and resistant to what is clearly led by the demands for change on the ground and the actual changes that have swept through rural Europe, albeit in different ways and at different paces in different places. This can be explained by the attempts of those with power and resources, in both industry and education, not wishing to give these up to new activities and to deny the legitimacy of softer process-oriented approaches to education and change management. A general attitude of 'better a subsidy in the bank than a learning process to help manage change and complexity' seems to have prevailed!

Despite all this, progress has been made and will continue to be made by the actions of a few individuals motivated by their subject and capable of sparking that interest not only in their students, but also in their teaching colleagues and administrators. Their efforts greatly benefit from the vocational relevance-demands of practitioners who face the need and urgency of a more integrated approach to rural development on a daily basis in everyday practice.

Finally, reflection on the relationship and level of congruency between one's outlook on Integrated Rural Development and one's view on teaching, learning and curriculum development is crucial. What we see emerging from the cases is a need to understand better the connection between biophysical and human systems. This is becoming a central task for higher education propelled, in part, by the multiple market failures and externalities that are found in the rural arena. Even though education for IRD can go down a number of routes, from soft-systems based learning to a modified or a more pragmatic positivism to a sociocritical transformative learning, it appears crucial to reflect on the relationships between one's conceptualisation of Integrated Rural Development and one's conceptualisation of teaching and learning. When such reflection and reflexivity becomes an integral part of curriculum development, Education and Training for Integrated Rural Development will make for a stronger, more meaningful and transformative learning experience that is likely to sustain itself beyond the time students spend in college.

This book has been a learning process for those engaged in its production, who have had the opportunity to view courses and programmes and to reflect on their own experiences relating to sustainability and integrated rural development. It is an unfinished journey of discovery on which we welcome fellow travellers.

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