Transdisciplinary Research and Mozambique: Finding a new pathway to old problems.

Chris Nelson, Juliet Willetts & Paul Bryce

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Abstract

This paper provides insight to how the concept of *transdisciplinarity* can inform development research. We recognise that development research inevitably crosses disciplinary boundaries and identify a lack of a consistent framework to negotiate this territory. We argue that *transdisciplinarity*, which is problem-focused, praxis based and capitalises on how different disciplines may be used to inform one another is a viable new approach. *Transdisciplinarity* may be used both to justify the validity and quality of development research in an academic sense, and provide research outcomes that are practical and meaningful in development practice. We provide a demonstration of a transdisciplinary research approach through a case study focusing on the IFAD PAMA project in Mozambique. This case study illustrates how new methodologies, notably *phenomenography*, may be successfully incorporated into a development research project.

Introduction

Finding new solutions to old problems is what effective management is all about. The loud calls for increased 'aid' flows in recent years from the likes of Jeffrey Sachs have been about finding new solutions to the problem of global poverty. His argument is that the neoclassical model has failed the developing world and it is now time to try something different. His model suggests that spending our way out of the poverty trap might just be what is needed. This idea is further developed by De Paula and Dymski's *Re-imagining Growth* (De Paula 2005). Their collection of essays suggests that new theoretical models can best help us imagine new possibilities if they are institutionally specific, historically informed, and able to incorporate diverse social and psychological processes. In short, critics are calling for a re-assessment of the aid industry and how it goes about the practice of delivering 'aid'. For this to happen, we need to start thinking about the development sector in a new way that embraces difference and demands unique understandings of complex systems.

The perceived failure of aid to lead to either rapid economic growth or poverty reduction is both exerting changes to the way aid is delivered and causing renewed interest in 'development research' (Moss 2005). In light of these developments, it would seem an opportune time to ask; how we should view 'development' theory? And are there new research approaches and methodologies that might shed light on the core challenges of development research?

The paper's core objective is to present the case for transdisciplinarity as a framework for development studies. To do this, we define transdisciplinarity and differentiate it from other modes of working across different disciplines. From this basis, we demonstrate how a transdisciplinary approach to 'development' research offers new pathways for researchers, particularly those working in a Sub-Saharan context. We then support our case by providing an example from the field of how such a research approach might be applied in practice. A research project currently being conducted in Mozambique is presented which involves using both insights gained through an analysis of planning theory and an investigation based on a research methodology called phenomenography. We show how this novel research approach is likely to provide new insight into aid practice, its limitations and the possibilities for going forward.

Development Theory – Why transdisciplinarity?

To situate transdisciplinarity in a development context, we need first to understand a little about the theoretical traditions of 'development research'. We therefore firstly provide a brief overview of the various epistemological strands in development research and look at the disparate positions that researchers have taken in their pursuit of a theoretical basis for their research. This provides evidence of the clear need for a coherent explanatory framework for development studies and research. We then present views on interdisciplinarity and multidisciplinarity and explain how these two frameworks fall short of adequately describing 'development research'. Finally, we

trace out the emergence of transdisciplinarity by describing how various authors have described its evolution, characteristics and how it might be applied to development research problems.

'Development research' has historically drawn on both an empiricist basis of knowledge (knowledge as human experience) and an instrumentalist (perceptions are useful instruments to explain our experiences) position as its theoretical basis (Tribe & Sumner 2004). Its empiricism has lent some researchers to a positivist epistemology, while its instrumentalism has fostered a constructivist epistemology informed by the post-modern critique. In this way, it has constructed its own conflicting realities where there are attempts at searching for one 'truth', alongside subjective constructivist searches for many 'truths'. This diverse ontological status of various strands within 'development research' has encouraged contemporary practitioners to look at different ways of contextualising the theoretical elements (Bauer 1991; Chambers 1983; Cook 1998; Crawford 2004; Eade 2003; Gruffydd-Jones 2001). Without a way to reconcile these differences, validating 'development studies' as a discipline of its own with academic authority is extremely difficult. What is referred to as 'development theory' largely belongs to the level of grand theories, broad explanatory frameworks. This is part of its limited character (Nederveen Pieterse 2001) that avoids acknowledging the highly differing approaches that co-exist and yet infrequently interact or are used to inform one another.

It is therefore imperative to acknowledge that 'development research' crosses various disciplinary boundaries and that we need a framework to situate it relative to other academic endeavours. To this end 'development research' is sometimes situated within interdisciplinary studies or multidisciplinary studies (Horlick-Jones 2004). However, we believe that both these fall short in adequately framing development research. The following exploration of the meanings various authors give to these terms makes clear these limitations.

According to Judge (1998) interdisciplinary theory implies a direct interaction between disciplines, with individuals being knowledgeable and experienced within more than one discipline, but isolated by their experience across academic fields. Max-Neef (Max-Neef 2004) puts forward interdisciplinarity as an hierarchical process where a dominant discipline imposes its judgement on other disciplines which are seen as working underneath it. In other words, there is a cooperation of sorts, but the leading discipline ultimately determines the research direction and provides the dominant epistemological basis. It seems then, that in interdisciplinary approaches, researchers draw on multiple 'knowledges' (either personal or inter-personal), but continue to situate their research in a defined and established 'academic' space. Development research, in some academic contexts, takes place in this manner with researchers working primarily in a particular discipline (eg economics), within an existing faculty, but informing their research somewhat with knowledge based in other departments and fields. In some ways such an approach provides for 'cross-fertilisation' between disciplines, but there is still the challenge of dealing with the hierarchical nature of the process and the unquestioned assumptions carried by the dominant discipline. Development research that takes on an

interdisciplinary approach then appears to continue to feed established political and academic structures, often resulting in positivist disciplines in the authoritarian role of 'overseer' of the research program (Robinson 2004). In addition, such an interdisciplinary framework is likely to fail to take the research beyond the academic sphere where it can more effectively interact with development practice.

Multidisciplinarity dilutes the research hierarchies seen in interdisciplinary approaches. However, it lacks the ability to adequately co-ordinate different types of knowledges produced in different disciplines. According to Judge (1998) a multidisciplinary theoretical approach is one that is fed by surrounding perspectives from other disciplines. In practice, according to Molteberg and Bergstrom, it implies that individuals work very largely within their own discipline but feed their work into teams that are from a range of disciplines. Similarly, Max Neef (2004) puts forward that multidisciplinarity involves research across the disciplines, but sees no cooperation between them. It appears, then, that multidisciplinary research constitutes disparate parts but little attempt to validate these various 'knowledges' into a coordinated framework. Such an approach is repeatedly seen in development studies whereby various researchers work with a plethora of tools, but with little coordination of this 'knowledge' or linking of the process to development practice (Bauer & Centre for Independent Studies (Australia) 1990; Cooke 2001; Eade 2003; Gruffydd-Jones 2001; McMichael 2000; Reusse 2002; Rihani 2002).

What then, is it about transdisciplinarity that sets it apart from these other disciplinary concepts? As the prefix 'trans' indicates, transdisciplinarity concerns that which is at once between the disciplines, across the different disciplines, and beyond all discipline (Judge 1998). Different theorists have taken varied approaches to exactly what this entails. Christoph Kuffer (2005) argues that transdisciplinary theory is concerned with the crossing of boundaries in the production of knowledge. Molteberg & Bergstrom see transdisciplinarity as the integration of disciplines so that the totality of the transdisciplinary study would be greater than the sum of the parts (Molteberg & Bergstrom 2000a and 2000b). Max-Neef (2004) sees transdisciplinarity as the result of a coordination between all different disciplines and the admission of multiple co-existent realities. As such, he argues that transdisciplinarity is about an interaction between various disciplines to provide coordinated practical answers to key questions in the real world, or, in the case of development research, in development practice. Importantly, in Max-Neef's view, such research is about creating the capacity for people to directly influence what they want to happen in their milieu (Max-Neef 2004). This description of transdisciplinarity is in alignment with the many proponents of theoretical praxis in development research. These include (Eade 2003; Reusse 2002; Rihani 2002), whose definition of praxis is a continuous cyclical process whereby theory informs practice which again informs theory and so on. It is clear then, that two important aspects of transdisciplinarity set it apart from other disciplinary concepts: firstly, the emphasis on co-ordination and integration of different types of 'knowledges' and secondly, the focus on solving real-world problems .

We argue then, that in a development context, transdisciplinarity offers a new pathway for researchers. It provides a way to combine various elements of methodologies drawn from different disciplines to form a single approach (Horlick-Jones 2004). That is, inputs and outputs are exchanged across disciplinary boundaries in an evolved meta-methodology which transcends 'pure' disciplines. In epistemological terms, transdisciplinarity involves an integration of 'knowledges' (Horlick-Jones 2004). This argument calls for engagement with the spheres of practice and experience, and with the associated informal 'knowledges' that exist in the real-world and for researchers to push the boundaries of where their problem is heading and where possible solutions might hide.

What is important in this pursuit is that there is clarity about what constitutes quality transdisciplinary research. In leaving behind the criteria and rules of specific disciplines, other measures of validity are needed to maintain a sense of academic rigour. Transdisciplinarity resides in territory where debate continues about issues of validity and where concern is expressed about 'rubbery' frameworks that are ill conceived or poorly justified (Kuffer 2005). The transdisciplinary discourse is maturing and beginning to deal with these needs. Carew (2004) maintains that quality transdisciplinary research adheres to the scholarly standards of Glassick et al. (1997) in their book "Scholarship Assessed" which require clear goals, adequate preparation, appropriate method and methodology, significance of results, effective communication and reflective critique. Given the "problem-solving" nature of transdisciplinary research, implicit in the term "effective communication" is the production of socially robust knowledge through on-going communication with stakeholders in the research during the research process (Carew, 2004). Another final measure of the quality of transdisciplinary research is the extent to which the research outcomes contribute to a solution to the original problem. In development research, this constitutes finding unique solutions that draw on diverse inputs to solve development problems like poverty, infrastructure, and healthcare.

Having established the benefits and legitimacy of a transdisciplinary approach, we now go on to present a research case study that draws on planning theory and phenomenography to illustrate how transdisciplinarity can be effectively embraced in a development research context.

The Case Study – Mozambique's Programa de Apoio aos Mercados Agrīcolas (PAMA) Project – International Fund for Agricultural Development (IFAD)

In this section we look at some background information about the IFAD PAMA aid project Mozambique. In the following sections we describe the research project that has been designed to investigate this case study and provide insight into how this, and other development aid projects, might be improved.

Background

Since the peace accord was signed in 1992, IFAD has maintained a close relationship with the Government of Mozambique and has been involved with various development projects in rural areas. Their intervention strategy is designed to reduce rural poverty, and develop enhanced commercial linkages that will provide farmers with a cash stimulus to supplement their subsistence production (IFAD 2001). The PAMA project is designed around a set of innovative development principles and primarily supports the maturation of the Mozambican economy through institutional and infrastructure support (IFAD 2004).

The focus of the IFAD strategy has been to concentrate on agricultural development. The agricultural sector employs 80% of the population, but contributes only 26% of GDP. Agricultural potential is enormous with large amounts of unutilised arable land and very low crop yields. The idea behind much of the support coming from IFAD is to improve this agricultural situation and encourage growth in rural areas.

IFAD's intervention in Mozambique is centred on the "commercialization of production systems as a basis for reducing rural poverty, and on the development of enhanced commercial linkages between small-scale producers and private markets." (IFAD 2001, p. vi) To do this, there is a crucial role for government to play in establishing a facilitating framework and managing the supply of a limited range of public goods and services to 'spread' the benefits to as wide an audience as possible.

The PAMA project itself has been allocated USD$26.6 million of which USD$22.8 million will be made up of concessionary loans to be paid off over a 40 year period. It is to be executed with the support of the National Institute for Rural Development (INDER) and overseen by the United Nations Office for Project Services (UNOPS). The forecast beneficiaries of the project will be the population from the three focal project areas through the different components of the project.

The PAMA project has very specific design elements illustrating recent shifts in development practice, with its focus on community involvement and dialogue. There are also characteristics of the project that reflect the traditional development approaches of the past, such as the road development component and the introduction of a central marketing board. The PAMA project was considered appropriate for this study as it was both current and was being undertaken by a large scale, international multilateral with a progressive approach to development practice. The project was conceived as a means of reducing rural poverty, but is multi-sectoral and seeks to provide flow-on effects for the rest of the Mozambican economy. Its complexity and scope were also important factors in choosing this case study as it provides and opportunity to analyse the complex nature of large scale development undertakings. Importantly, it provides a field-based platform for the trial of the proposed transdisciplinary research that is presented below.

The Academic Fields and the 'aid' program

Here we present an overview of the academic fields embraced in our study of the IFAD PAMA project. To varying degrees, we draw on the fields of organisational theory; communicative rationality; planning theory and design; and knowledge management to illustrate the complex nature of large scale development projects. Transdisciplinarity offers a framework to incorporate these diverse fields in an investigation of how the project operates and delivers. Seen in this way, a transdisciplinary approach becomes an instrument for innovation and action. In a development context, the various theories provide a way of exploring the important interdependencies that are at work in development practice. It also highlights some of the key changes that are taking place in the developing world that are not adequately explored in current development literature.

How do we apply these fields to development research? And, how do they inform a transdisciplinary approach to this undertaking? If we address these questions to the IFAD PAMA project, we might get some idea of how they can frame the research program. Let's start by looking at what the project sets out to do and how it proposes to do it. The project objectives are outlined in the IFAD case study documentation prepared by its sub-contracting consultants. These objectives offer a broad sweep of issues that seek to address the issue of poverty in rural communities in Mozambique. What they don't do is acknowledge the incredible complexity of the Mozambican context and the historically significant barriers to poverty reduction and welfare reform that make the process of development research disconnected from the reality of development practice (Watson 2002).

For the PAMA project, the challenge was to go beyond the boundaries of IFAD's standard development planning and project proposals. What would be required is a new way of fostering relationships between government and citizens, and a planning system that tackles the 'marginalization' of the general populace. In the Mozambican context, it is all about finding out the ways that citizens, government and NGO's communicate, and providing a voice for those encumbered by ineffective systems. The highly dysfunctional nature of civil society in many countries in Sub-Saharan Africa, of which Mozambique is included, makes it extremely difficult for the organs of civil society to operate efficiently. Social or grassroots movements are few, fragile and often tied to ethnic interests, and cannot necessarily be relied on to take forward issues of broader public interest. For this reason, it is not possible to think about planning in Africa outside the issue of development more generally, given that planning is underpinned by assumptions relating to wider economic and societal frameworks. Development research, therefore, needs to change if it is to effectively deal with the current problems that exist in the development program. The importance of integration within planning frameworks has been underscored by an increasing faith in civil society and social movements to build democracy and local economic development. The policies to reduce the role and power of central governments, to decentralise them and to privatise public services have not served Africa well (Gruffydd-Jones 2001). This lends support to a form of planning in which governments play an important role, but are certainly not the

only players. It recognizes that 'the local' both shapes, and is shaped by, broader structural forces, and that local action on its own will be limited and depoliticizing (Watson 2002).

The IFAD PAMA project design suffers from a format that is burdened by many of the traditional problems of standard development practice. It does not adequately address the issues of how organisations work, how communities function, how knowledge is shared, how governance protocols work and how the increasing 'informalisation' of the economy will determine economic growth trends. The above discussion provides a useful introduction to the benefit of trying new ways of investigating traditional problems and it underscores the failure of past research approaches in tackling the development dilemma. We found that an incorporated transdisciplinary approach offered a useful framework for isolating where the problems are in current development research. What we now need to find is a methodology that might shed new light on how these problems can be tackled, incorporated and recognised in the development research process.

Phenomenography – A new approach to investigating a development project

Here we use our case study as a means to explore a new methodology and refine research development practices that work outside the 'traditional' approaches favoured by research in the past. To address the three problems in the IFAD project design raised by the communicative planning approach, we need to investigate the ways that various stakeholders understand and relate to an aid project. We need to go further than simply filling in responses in a performance matrix against the donor's desired outcomes. In short, we need to delve into just how stakeholders at all levels actually engage with the project. To do this, we propose using a set of phenomenographic interviews to provide new insight into the way individuals engage with the development process.

What then is this phenomenography, and how can it inform the development research process?

> Phenomenography is a research method adapted for mapping the qualitatively different ways in which people experience, conceptualise, perceive, and understand various aspects of the phenomena in the world around them (Marton 1986).

In this research project, the "phenomena" of interest is the IFAD PAMA project itself, though it need not be so restrictive should we be more interested in the responses to another or alternative phenomena.

Engagement with stakeholders is fundamental to the accurate assessment of qualitative outcomes for social programs. To clearly extrapolate how stakeholders can be drivers for improving how things are done, we must acknowledge their understanding of the process and endeavour to convert their experience into observable outcomes. To do this, phenomenography offers a pathway that has a number of key advantages.

First, it enables the range of perspectives of 'development' to be presented in a collectivized system of categories of description that aim to capture the essence of the different ways of experiencing the phenomenon. There is a focus on the variation between the different ways of experiencing the development process and how individuals engage with it.

Second, it acknowledges that the development context is fundamental to the stakeholder's engagement with the process. It assumes:

> [t]hat people's 'ways of experiencing' phenomena result from the unique interaction of their understanding of the phenomenon and the situation in which they must apply that understanding" (Bowden and Martin 1998 in Bowden & Walsh 2000, p. 141)

It also assumes that people experience the world differently because they vary in their comprehension and perception of phenomenon and the situations they are in.

The basic premise of phenomenography has traditionally been applied to studies of higher education and learning. It emerged as a method to explore the different ways that students learn and thereby engage with the pedagogical process (Bowden & Walsh 2000). The application of the method to development research is also about a studying a learning process. The difference being that learning is now twofold. First, it is about how we integrate the experiences of recipient communities and donor groups into the program design to improve our understanding of how social capital networks can inform development practice. Second, it is about how stakeholders learn about the development project. The method provides engagement with both the subject and the object. That is, between the recipient and the project, and between the donor and the design. The approach seeks to acknowledge both formal and informal networks, identify management features, and illustrate how coordination has occurred. In this way, it tackles the *transdisciplinary* challenges that reflect the diversity of the development research task.

In a development context, phenomenography means understanding that an individual's engagement with the 'aid' process is going to vary according to their cultural, hierarchical and developmental status. This research approach illustrates the engagement these individuals have with the project and reveals how the framework will affect outcomes. The phenomenographic approach places the authority with the recipient community and in this research project we intend on feeding such information back into the project formulation process by revealing key drivers for how aid is perceived, utilised and understood. In a planning context, this might have the potential to allow the system to evolve based on the experiences and engagement that recipients have with a project or aid process.

The important step in the phenomenographic approach is the acknowledgement of the learning process. Phenomenography offers us the chance to explore the kind of

responses and engagement that stakeholders have with development projects that fall outside the normal classification of 'objectives' assessment. It provides a means of exploring all of the interactions that take place whether they be social, economic, cultural or environmental. This enables us to gain new insight into the learning process of development engagement and whether this can be a positive or negative experience.

Rick Davies, the monitoring and evaluation practitioner, has acknowledged that the amount of attention given to the assessment of the project funding mechanism has been poor. He notes that:

> [i]n an ideal world, feedback from project-level monitoring and evaluation activities would lead to refinement of these theories about good projects, and this would be evident in changed selection criteria for accepting and funding project proposals. The funding mechanism would get better and better at spotting and funding good projects. In reality I have never seen this sort of feedback link in operation (Davies 2004).

This research offers the opportunity to begin a process of incorporating the responses of those linked to projects into future planning procedures. It will do this through the phenomenographic classification of recipient responses. In the case of the PAMA project it will simply be a retrospective outline of how stakeholders engaged with the project phenomena. In a more macro context, it would be about the employment of sophisticated feedback arrangements in programs where stakeholders maintain an on-going dialogue with planning coordinators and there is evolutionary adjustment in the program cycle.

How will the process work?

The phenomenographic process used in the research project seeks to 'uncover' the range of qualitatively different ways of experiencing a given phenomena (Carew 2004). To do this, We will frame my results using Sandberg's methodological approach which seeks to calibrate recipient responses by adopting a set of attitudes toward the interview transcripts (Bowden & Walsh 2000). Therefore, the protocol for analysis will follow Sandberg's interpretative guidelines:

1. An orientation towards the phenomenon and how it appears throughout the research process; this involves identifying different ways in which stakeholders describe their involvement with the PAMA project.
2. Seeking to describe the experience under investigation, rather than trying to explain it; this is the process of acknowledging variation in responses and analysing them in different groups.
3. Horizontalizing the material being analysed – treating everything which is said as being of equal importance; the process of taking the groups and sorting responses in terms of their focus and frames of reference.

4. Seeking structural features in the experience under investigation; finding a way of describing the groupings and identifying where responses might not fit and then reclassifying them.
5. Using intentionality as a correlational rule (looking at what is focused on and how it is represented); this is the process of seeing relations in groupings and the hierarchy of categories. It is the coordination of the relations and responses.

We hope to legitimize the categorization through mediation with other phenomenographic practitioners who can participate in an iterative process of transcript analysis and validation. This approach is not a necessary step in Sandberg's methodology, but is important where we am working with a new field of phenomenographic enquiry. The outcomes can then be used to frame the order of stakeholder experiences and incorporate these into future planning protocols.

Envisioning new methods of development research

This paper sought to present transdisciplinarity as a way of moving beyond the concept of development research as prescribed intervention. In applying various academic fields to the development dilemma, it acknowledged the need for a 'shift' amongst researchers to incorporate a more informed idea of how the 'development' process can effectively function as an integrated system. To do this though, there must be a change in the way that development research is done and the consideration of alternatives to the current approaches.

The definition of transdisciplinarity presented referred to the combination of the various elements of methodologies drawn from different disciplines working together to form a single approach. In development research, there is a need for these new approaches to reveal the multi-faceted reasons why the process of 'development aid' is such a difficult proposition. Use of praxis such that practice is directly fed by theoretical insights of academics and researchers offers tremendous opportunities for LDC's, but for this to emerge the established research culture must change. Much of the argument surrounding the development research program has been about prescribing a panacea for economic growth and efficiency. Development research offers much more than this. The real problem is that there has been no real sense for how a different model might be designed, nor consideration for the positive socio-cultural aspects of recipient communities. Transdisciplinarity offers a way to explore new models and perhaps to find some interesting insights through methodological modification and production of socially robust knowledge that is meaningful in development practice.

Bauer, P.T. 1991, *The development frontier : essays in applied economics*, Harvester Wheatsheaf, London.

Bauer, P.T. & Centre for Independent Studies (Australia) 1990, *Economic control or economic development? : the sixth John Bonython lecture delivered at the Victorian Arts Centre, 2nd November 1989*, Centre for Independent Studies, [Sydney].

Bowden, J.A. & Walsh, E. 2000, *Phenomenography*, RMIT University Press, Melbourne.

Carew, A. 2004, 'Reflective and Post-normal Engineering: Models of sustainable engineering practice and their implications for undergraduate teaching and learning' (PhD Thesis), Sydney.

Chambers, R. 1983, *Rural Development: Putting the Last First*, Pearson, Harlow.

Cook, S.C.A., J S 1998, 'A Systems thinking Approach to Selecting Systems Methodologies for Defence High-Level Systems', *Proceedings of Systems Engineering 98*.

Cooke, B.K., Uma (editors) 2001, *Participation: The New Tyranny*, 1st edn, Zed Books, London.

Crawford, P. 2004, 'Aiding Aid: A monitoring and evaluation framework to enhance international aid effectiveness', PhD. thesis, UTS, Sydney.

Davies, R. 2004, *Projects versus Project funding mechanisms*, <http://mandenews.blogspot.com/2004>.

De Paula, S.D., G. 2005, *Reimagining Growth: Towards a Renewal of Development Theory*, Zed Books, London.

Eade, D.e. 2003, *Development Methods and Approaches: Critical reflections*, Oxfam, London.

Gruffydd-Jones, B. 2001, 'Explaining Global Poverty: A realist critique of the orthodox approach', *Journal of Critical Realism*, vol. Volume 4, no. Number 1, <http://www.journalofcriticalrealism.org/>.

Horlick-Jones, T.S.J. 2004, 'Living on the Border: knowledge, risk and transdisciplinarity', *Futures*, vol. 36, pp. 441-456.

IFAD 2001, *Republic of Mozambique - Country Strategic Opportunities Paper (COSOP)*, IFAD, Rome.

IFAD 2004, *IRepublic of Mozambique - Country Strategic Opportunities Paper (COSOP)*, IFAD, Rome.

Judge, A. 1998, *Transdisciplinarity as the experience of Patterned experience*, Hugin Editores, viewed 14.06.05 2005 <www.laetusinpraesens.org/docs/transpat1.php>.

Kuffer, C. 2005, *About the network of Transdisciplinarity*, network for transdisciplinarity in sciences and humanities, viewed 14/06/05 2005 <www.transdisciplinarity.ch/bibliographie.html>.

Marton, F. 1986, 'Phenomenography: a research approach to investigating different understandings of reality', *Journal of Thought*, vol. 21, no. 3, pp. 28-49.

Max-Neef, M. 2004, 'Foundations of transdisciplinarity', *Journal of Ecological Economics*, vol. Volume 53, no. Issue 1, pp. Pages 1-145.

McMichael, P. 2000, *Development and social change : a global perspective*, 2nd edn, Pine Forge Press, Thousand Oaks, Calif.

Molteberg, C. & Bergstrom, C. 2000a and 2000b, 'Our Common Discourse: Diversity and Paradigms in Development Studies', *Noragric Working Papers - Centre for International Studies*, vol. nos 20 and 21.

Moss, T. 2005, *Current issues in development assistance to Sub-Saharan Africa*, The Economist, London.

Nederveen Pieterse, J. 2001, *Development theory : deconstructions/reconstructions*, SAGE, London.

Reusse, E. 2002, *The Ills of Aid: An Analysis of Third World Development Policies*, University of Chicago Press, Chicago.

Rihani, S. 2002, *Complex Systems Theory and Development Practice*, Zed Books, London.

Robinson, J. 2004, 'Squaring the circle? Some thoughts on the idea of sustainable development', *Ecological Economics*, vol. 48, pp. 369-384 <www.elsevier.com/locate/ecolecon>.

Tribe, M. & Sumner, A. 2004, 'The Nature of Epistemology and Methodology in Development Studies: What do we mean by 'rigour'?' *The Nature of Development Studies*, ed. DSA, DSA, Church House, London.

Watson, V. 2002, 'The usefulness of normative planning theories in the context of sub-Saharan Africa', *Planning theory*, vol. 1, no. 1, pp. 27-52.