



Workshop

Sharing of experiences between interdisciplinary PhD research programmes related to agricultural and rural development

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REPORT



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1. Introduction

Addressing the world's pressing problems like climate change, food security related to the energy crisis and sustainable economic development requires the input of scientists with different disciplinary backgrounds. Combining knowledge on biophysical aspects, socio-economic and legal aspects, and human behaviour provides better answers to complex problems than mono-disciplinary approaches. Besides, interdisciplinary research yields new scientific insights (across disciplinary boundaries).

Despite the consensus on the need for interdisciplinary research, the challenge concerning implementation of interdisciplinary research remains. This is especially the case with development oriented interdisciplinary PhD research programmes where scientific excellence and innovation have to be combined with relevance and impact.

One of the actions planned within the ERA-ARD programme¹ is to share experiences in this field through the organisation of a workshop on 11 – 12 December 2008: “Strengthening joint learning from experiences in interdisciplinary PhD research involving European and Sub-Sahara Africa universities and applying an innovation systems / IAR4D² approach”.

The workshop was organised jointly by Wageningen International and ICRA, and funded by the Dutch budget of the ERA-ARD project. Within the context of ERA-ARD it brought together representatives of a number of European interdisciplinary PhD research programmes in the field of ARD and some of their African partners to learn from existing experiences. For the list of participants, see Annex 10.

During the workshop the discussions were organised around four topics:

- Enhancing the synergy between different scientific disciplines involved in interdisciplinary research to address complex development issues.
- Embedding of societal problems in interdisciplinary PhD research programmes (or how to ensure the D in ARD-oriented PhD programmes?).
- Organising interdisciplinary PhD research programmes and North-South partnerships (what are the different models and approaches?).
- Using the results of interdisciplinary PhD research in practice.

Each of the topics was introduced by representatives of two of the participating PhD programmes or institutions involved in interdisciplinary PhD research. After the two presentations, one of the African colleagues was asked to react on the two presentations and to add issues based of his African experiences.

¹ The ERA-ARD programme – the Agricultural Research for Development (ARD) dimension of the European Research Area (ERA) – is an FP6 Project of the European Commission's ERA-NET Scheme (see www.era-ard.org). The objective of the ERA-NET scheme is to step up the cooperation and coordination of research activities carried out at national or regional level in the Member States and Associated States.

² Integrated Agricultural Research for Development (IAR4D) is research that uses an innovation systems approach and integrates actions in different fields and at different levels (i.e., intensification of smallholder farming, access to markets, enabling policies and sustainable use of natural resources).

Subsequently, the topic was discussed in working groups, using the statements proposed by the two presenters as a starting point. The results of each working group were discussed in a plenary session.

2 Dimensions of interdisciplinary PhD research programmes.

2.1. Enhancing the synergy between different scientific disciplines involved in interdisciplinary research to address complex development issues.

Introductions

This topic was introduced by Paul Vlek, Zentrum für Entwicklungsforschung (ZEF), Germany, and Alistair Sutherland, Natural Resources Institute (NRI), United Kingdom.

To enhance the quality of interdisciplinary PhD research and education, Paul Vlek summarized the four pillars of the ZEF interdisciplinary programmes:

- Quality of collaboration; mental, organisational, and conceptual.
- Transparency in project management; common project plan, students involved in management issues.
- Building mutual trust; joint courses, frequent visits, joint presentations.
- Good communication; regular interactions, meetings and workshops, providing communication infrastructure, access to central project databases, writing joint papers.

For more information on this presentation see Annex 1.

Alistair Sutherland summarised the internal and external factors that had enabled or hindered interdisciplinary approaches at NRI. Challenges for interdisciplinary PhD research summarized include:

- The existing peer review system operated by the mainstream research councils like BBSRC and ESRC make obtaining funding for any interdisciplinary work difficult.
- What is expected of a PhD student? Is it disciplinary depth or interdisciplinary breadth? Taking into account the disciplinary organisation of most research institutes, will interdisciplinary trained scientists find a position in disciplinary departments after the thesis defence?
- Funders of research and capacity strengthening development projects often emphasise the need for research to have a development impact. What incentives might they provide for PhDs that address the areas of complexity that best lend themselves to an interdisciplinary approach?

For more information on this presentation see Annex 2.

Discussant

Paul Kibwika (Makerere University, Uganda) added the following points before participants went into the group discussions:

- Why are we talking about interdisciplinary PhD research? We want to address complex issues which can be solved only by applying an interdisciplinary approach.
- Because we have to tackle complex problems, programmes are needed in which development and scientific communities are combined.
- A question is: is an interdisciplinary PhD possible, or is it more realistic to conduct mono-disciplinary PhD research where students work in a large interdisciplinary programme in which the different actors play complementary roles?
- An individual PhD student will not solve a complex problem because the period of 4 years is too short. A programme approach is needed to increase the chances for impact.
- Challenges for interdisciplinary research are: combination of different scientific methodologies, the mutual learning of PhD students and supervisors linked with the reality on the ground, and the institutional setting of the scientific environment to enhance interdisciplinarity.

Results of the group discussions

The statement which guided the discussion on the first topic was:

- Interdisciplinarity has to be lived and practised in a context. It cannot be taught in a purely academic setting.

The results of the discussions can be summarized at different levels. At a more conceptual level:

- The terminology inter-, cross-, multi- and trans-disciplinarity needs to be better defined to create a mutual understanding on the different terminology used. Also during our workshop, there was confusion about the terminology, complicating the discussions.
- Interdisciplinary research is not yet main-streamed, while it has been discussed and tried for over 20-30 years. Why is progress so limited?
- Talking about interdisciplinary PhD research two models can be envisaged. The first one is that the PhD candidate is fully interdisciplinary in research and approaches applied cut across the different scientific fields and paradigms. This model has a high potential for really new insights but may have serious drawbacks. It seems unrealistic to expect a PhD student, relatively young and not very experienced to have the capacity to work across various disciplines. There is a risk that the thesis will not up to the expected (less interdisciplinary) scientific standards. Secondly, a fully interdisciplinary thesis may hamper the career opportunities because most scientists are recruited because they have a specialisation in a specific field. A second model for interdisciplinary PhD research discussed is the programme model. In this model a number of disciplinary PhD students work in the programme together, also with supervising staff, on a complex issue.

The PhD students develop the capacities to discuss and work together with other disciplines, and may publish joint papers, but will have their own specialisation. Organisation of the programme will be very important to create an enhancing environment. Staff will play an important role to assure the interdisciplinarity, in the research process and obtaining interdisciplinary results.

Most of the participants to the workshop were in favour of this second model. Full interdisciplinary PhD projects are possible but it will be difficult for most of the candidates.

Adopting the second model as most appropriate for interdisciplinary PhD research on complex issues, a number of organisational aspects have to be taken into account:

- Joint conceptualisation and definition of the continuum of the problem across disciplines, and joint proposal development.
- The programme developed provides a framework for the PhD candidates' more disciplinary oriented PhD research proposal (this is a responsibility of the candidates).
- Supervisors, including the national supervisors in the southern countries, have to work together, and thereby provide a model for cooperation between PhD students.
- The role of supervisors is critical. They have the final responsibility of the programme, and as such also for the PhD research projects, they should help the students to focus, they have to create an enhancing interdisciplinary environment for research and education, enhance the communication, and they have to establish a quality assurance mechanism and standards.

2.2. Embedding of societal problems in interdisciplinary PhD research programmes (or how to ensure the D in ARD-oriented PhD programmes?).

Introductions

This topic was introduced by Anke Niehof (Wageningen University, the Netherlands) and Arnold van Huis (Wageningen University).

Anke Niehof presented the approach used in the African Women Leaders in Agriculture and the Environment (AWLEA) programme to illustrate how societal problems can be embedded in interdisciplinary PhD research programmes. The project addresses these issues in the following ways:

- By training the students and coaching them to the doctorate, the project is empowering a group of women who, because of their commitment to enhancing the role of women in development, with their title, academic accomplishments and experience abroad, can become leaders in their country and hold positions of authority where they can make a difference.

- By training in gender studies and by integrating a gender perspective in their research, the students can lay bare the causes, mechanisms and consequences for agricultural and rural development of gender disparities in their own country. In this way they contribute indirectly to women's empowerment.
- By the choice of their topics of research the students address key societal problems such as feminisation of agriculture, food insecurity, poverty, and impacts of HIV/AIDS. They do so in a gender-sensitive manner (in which they were trained), using validated scientific methods and theoretical frameworks that are subject to scrutiny in the academic context.

In the AWLEA project, some PhD students were trained in a full interdisciplinary way (model 1 as described above).

For more information, see Annex 3.

Arnold van Huis presented the experiences of the Convergence of Sciences programme.

The Convergence of Sciences programme (CoS) addressed the sub-optimal impact of science on the livelihoods of resource-poor farmers in West Africa, particularly in Benin and Ghana. "Convergence" in the CoS programme means both, inter-disciplinarity, especially between social and natural sciences, and science as a multi-stakeholder process. In this process-driven science, social and natural science disciplines work together to create new knowledge, modes of thinking, and theory. A typical example of the integration of life, earth and social sciences is the work of one student who not only experimented with farmers on low external input agronomic practices for sustainable cocoa production, but also mobilised a district consortium to deal with the common practice of doctoring weighing scales by Licensed Buying Agencies. In other words, CoS PhD researchers not only experimented with farmers to develop technologies, they also sought to intervene in social arrangements to create human activity systems that improve the conditions small-scale farmers face.

For more information on the CoS programme, see Annex 4.

Discussant

Emmanuel Owusi-Bennoah (Legon University, Ghana) added the following points before participants went into the group discussions:

- The first question to be raised is whose societal problems we want to incorporate in the interdisciplinary research problems? Who is setting the priorities?
- In case of development oriented research programmes, addressing poverty alleviation and livelihood improvements, a bottom-up approach in identifying the societal problems to be addressed should be part of the research programme development trajectory.
- But it is not necessary to identify for each research programme the societal problems to be addressed. Research priorities have been set by the various regional organisations in Africa and can be used for programme development.

- Including the societal problems in the programme development stage is not enough to ensure that the societal problems are well embedded in the interdisciplinary PhD research. During execution, the PhD students should be embedded in innovation platforms, to enhance interactions with the different stakeholders.
- The PhD research should aim for results that are practical and can be used in practice.

Results of the group discussions

The statements which guided the discussion on the second topic were:

- Societal relevance for a PhD programme always means collaboration between socio-economic and natural science disciplines.
- Building societal relevance into a PhD study means that the scientific content will suffer.

The discussions in the working groups highlighted the following important issues:

- Different stakeholders may formulate different societal issues to be addressed in interdisciplinary PhD research programmes. Policy makers will identify other issues than civil society, international organisations, farmers' organisations or small-holders farmers. Scale and power issues are important in identifying the societal issues. When women are not involved in priority setting, gender issues will never be a priority.
- An interdisciplinary research approach is already a good mechanism to ensure the D in ARD-oriented PhD programmes. Such an approach helps to focus better on real societal issues compared to a mono-disciplinary approach. Problems are analysed from different perspectives (scientific and stakeholders) and priorities for research agreed upon. In such a way, alternative development strategies can be developed that are acceptable to society.
- Participants did not agree with the statement that the scientific content of a PhD project will suffer when societal relevance is built into the PhD study. High quality PhD research can contribute to achieving the Millennium Development Goals (MDGs).
- Interdisciplinary PhD research has to be embedded in the societal context like for instance innovation networks, not only to ensure the relevance of the PhD research, but also to communicate the outcomes of the research to the stakeholders. In addition, the PhD student has to be embedded in the scientific environment, to develop skills and capacities for interdisciplinary research. Not every single PhD student will need to have supervisors from a natural science and socio-economic discipline. This depends on the research subject and the division of research tasks within the programme (other PhD students, staff, post-doc, etc.).
- In the field of research for development there is always the discussion on the type of research and the role of science in problem resolution. Normally, a sub-division in applied, strategic and fundamental research is used. Applied research is the most practical, solution oriented research. At the other end of the spectrum, the fundamental (PhD) research can contribute to solutions of societal issues, but has also to contribute to the science knowledge base. The

question remains how much PhD research can contribute directly to problem resolution or how the results of PhD research can be carried on by others to contribute to solutions?

2.3. Organising interdisciplinary PhD research programmes and North-South partnerships (what are the different models and approaches?).

Introductions

This topic was introduced by Gertjan Beex (Wageningen University, the Netherlands) and Stephan Rist (University of Bern, Switzerland).

Gertjan Beex conducted an evaluation of the management models for the cohort approach (groups of 8 – 12 PhD students starting at the same moment in one coherent research programme) as used by the programmes of the Interdisciplinary Research and Education Fund (INREF) of Wageningen University. As guidance for the analysis, he used the four organisational models distinguished by Rossini & Porter (1979):

- Common group learning; research output reflects the common intellectual property of the entire research group.
- Modelling; research outputs result from combined scientific work on a model.
- Negotiation among experts; integration takes place by negotiation between team members.
- Integration of research by a leader.

Evaluating the INREF programmes, one of the conclusions was that integration within the INREF programmes was limited, because the programme teams did not discuss and decide on “a model” for integration at the start of the programme.

The models given by Porter should be used in a flexible way, and other models may be more adequate. The important message is that at the start of the interdisciplinary research programme, the team has to reflect on the most appropriate model for integrating the individual PhD projects and the responsibilities of the team members in this important programme activity.

For more information, see Annex 5.

Stephan Rist presented organisational aspects of the Swiss National Centre of Competence in Research (NCCR) North-South programme. This is a 10-year programme of 7 Swiss partner institutions and about 165 southern partner institutions in 27 selected countries. Objectives of the NCCR programme are: (1) to further disciplinary, interdisciplinary and transdisciplinary research aiming at sustainable development; (2) to strengthen institutions and train staff in partner countries; and (3) to support the partner countries in solving development related issues.

The research approach of the NCCR programme is based on: (1) social negotiation of research questions; (2) integration of natural and social sciences; (3) integration of non-academic knowledge and actors; (4) dialogue between different forms of knowledge (target -, system -, and transformation knowledge); and (5) defining collective action. The shared and specific responsibilities of the PhD researchers in

the programme and the institutional support provided by the programme are well defined.

More information on this topic is provided in Annex 6.

Discussant

Shaaban Mgana (Ardhi University, Tanzania) raised the following additional issues for the group discussions:

- Selection of the organisational model of an interdisciplinary PhD research programme should be discussed and agreed upon during programme formulation with all partners involved. Partners in the South are often confronted with already developed programme ideas and set-ups. Southern partners should be more strongly involved in agenda setting and programme development, including institutional arrangements and organisational issues. Seed money should be made available for participation in programme development.
- The topic of this workshop is interdisciplinary PhD research and capacity building within North-South partnerships. Does one (or more) of the presented models have specific characteristics important for strengthening these partnerships? It seems that the presented models do not take into account the capacity building in the Southern partner countries.
- In the situation of the INREF programme, in which the discussant is involved, the rules of the game are agreed upon and established in an MOU, including management issues, subscription to the Universities, supervision, data sharing and (joint) publication. The programme, however, does not provide the necessary financial resources to allow the southern university to implement the agreed actions. Salaries are low and infrastructure sub-optimal. These aspects have to be addressed during the programme development phase.

Results of the group discussions

The discussions in the working groups highlighted the following important issues:

- Based on the interactions and discussions during the workshop and the experiences of the participants, two different models for interdisciplinary PhD research programmes can be distinguished.
The first is the cohort approach, where a group of PhD students start at the same time, share part of their training and proposal development trajectory, and work together during the research period. Regular programme meetings are organised for interaction and exchange of results. Strong interaction between staff and students enhances the interdisciplinary character of the research. The programme determines the broad topics for the PhD students. The second model is the large programme approach which provides an interdisciplinary framework for more individual PhD positions. The students start with a common training period and develop capacities to work and interact with other disciplines. After the training period there are more degrees of freedom for the PhD students to develop their research proposal.
- The model selected for an interdisciplinary research programme depends on the funding available (programme funding or individual scholarships), the

philosophy on interdisciplinary PhD research of the leading University, and the lifecycle of the programme.

- Both models have in common that supervisors, staff and post-docs play an important role in programme management and integration of the scientific results of the individual PhD projects. PhD students have more supervisors (North and South), so a supervisor spends more time in interaction with other supervisors and with all other participants during workshops and conferences. Partnerships with southern Universities require also resources for the southern partners. In summary, these kinds of research programmes need more resources and demand higher time investments by the staff than individual, more mono-disciplinary PhD research projects.
- For Southern partners in North-South research partnerships, capacity development is more than training PhD students. Capacity development is also enhancing the research infrastructure at their institutes, including investments in equipment. It is very important to improve the research infrastructure, so that the PhD student, after the defence of his/her thesis, can continue with high quality research when back at his/her university or research institute. It has also been proposed to create a (post-doc) facility for the PhD students when going home, to fund new research activities for a restricted period (like WHO).
- Independently of which model will be used in the North-South PhD research partnership, specific southern conditions have to be taken into account for a smooth cooperation and execution of the research programme. A number of incentives have been listed to enhance the motivation of Southern partners, including: engagement of Southern partners from the start, including joint budgeting, to create ownership; payment of staff (top-up salaries, overhead for management costs, honorarium for supervisors); joint degrees; joint publications; and shared facilities for the Southern partners.

2.4. Using the results of interdisciplinary PhD research in practice.

Introductions

This topic was introduced by Connie Almekinders (Wageningen University, the Netherlands) and Jon Daane (International Centre for development oriented Research in Agriculture (ICRA), the Netherlands/France).

Connie Almekinders summarised the experiences of the PAU programme. The thematic scope of this PhD programme was 'Participatory Approaches in agricultural (technology) development and their Up-scaling'. The research in the PhD programme would be instrumental in giving answers to such questions as: which participatory research and development approaches worked best and how could they most effectively be scaled-up to reach more farmers in a shorter period of time? PhD students involved in the PAU programme were for about 50% of their time involved in interdisciplinary research, and for 50% of their time in action research. The PhD candidates were trained in a range of cross-cutting social skills.

For the use of individual PhD findings in practice, i.e. to improve real life complex situations, three phases are essential:

- Integration and synthesis, for example when the research is mostly disciplinary and findings need to be combined with insights from other disciplinary studies or studies carried out at other aspects of the same issue.
- Translation of the research findings into the ‘language’ of practitioners (design-oriented and adapted vocabulary) and policymakers (policy implications, and adapted vocabulary).
- Application of the findings in (other) contexts.

Currently, none of these three phases are usually parts of an individual PhD training and research, they ill-fit the time limitation and individual character of PhD projects.

For more information, see Annex 7.

Jon Daane presented the experience of ICRA in enhancing the chances that research contributes to development (e.g. through innovations in value chains and natural resources management). Lessons from this experience could be relevant for interdisciplinary PhD research. In ICRA’s view development often poses complex issues that cannot be resolved through a linear research-to-development process, nor by individual action. Resolving such issues requires continuous interaction and mutual learning between all relevant stakeholders at all stages of the research, innovation and upscaling process. ICRA improves the quality and efficiency of this process through iterative learning cycles involving all stakeholders. This common learning process results in a shared vision, consolidated partnerships, joint analysis, options for solutions, planning of joint actions, and implementation of the joint actions planned. Such learning cycles and processes could also be used to formulate interdisciplinary PhD research programmes by involving PhD candidates from different disciplinary backgrounds and their supervisors.

In the specific context of PhD research, one of the challenges for the use of ICRA’s experience with learning cycles and the selection of relevant research issues for development by non-research actors is that the mode of operation and culture of higher education institutes hinders the integration of complementary PhD studies.

For more information, see Annex 8.

Discussant

Paul Kibwika (Makerere University) added the following points before participants went into the group discussions:

- Impact of development oriented research (direct or indirect) is often difficult to measure. An extra difficulty concerning the impact of PhD research is that the period of four years is often too short to produce results that can be applied directly, in combination with the fact that the PhD research is primarily oriented to the contribution of knowledge to the scientific knowledge base.
- Are academics responsible for application of the results produced through PhD research? Or do we have to develop other mechanisms to make the results of

PhD research more applicable? Options mentioned include: embedding the PhD research in development programmes, post-PhD projects to 'translate' the scientific results into better applicable knowledge, or better communication mechanisms between scientists and potential users (farmers, policymakers, etc.).

- In the context of interdisciplinary PhD research it is proposed to use the terminology 'outcomes' in stead of 'impact'. Outcomes are more divers than impact. In this context it is also better to talk about 'research on development' instead of 'research for development'.
- To produce tangible outcomes, the scientist should be connected to practitioners during programme formulation and execution. But for many good scientists, this is not an easy task. During the PhD training and research project, the PhD candidates have to be trained in skills such as process organisation, negotiation, team building, and conflict management.

Results of the group discussions

The statements which guided the discussion on the fourth topic were:

- Conceptually separating the production and use of results of interdisciplinary PhD research in time and space decreases the chances that results are used and is thus counterproductive.
- In the current academic set-up we need more attention for the translation and communication, and suitable partnerships for the use of PhD research findings in practice.

The discussion in the different groups confirmed the main points made by the two speakers and the discussant.

- In order to tackle complex development related issues, an interdisciplinary approach is required. The interdisciplinary approach, combined with a participatory approach, helps to focus the PhD research in the larger development context and enhances the relevance of the PhD research project.
- We have to be realistic in our expectations of direct impact from PhD research. The outputs have to be translated into outcomes. Different levels of outcomes have to be mapped out and the projects should focus on the realistic levels of possible impact.
- To bring the PhD research outcomes further, other mechanisms have to be used like embedding the PhD research in large development oriented programmes, engagement with policy makers at different levels, and functional partnerships with development agents. Impact needs an ex-ante phase.
- It is a challenge for researchers to develop the skills required to operate in the multi-actor setting.
- It is a challenge for Universities to create an enabling environment for their staff to operate in a multi-actor setting.

3. Recommendations for policymakers

The subject was introduced by Jacques Brossier (Institut National de Recherche Agronomique (INRA), France). Due to time constraints the recommendations as presented have not been discussed in depth. Below, a short summary of the presentation and the discussion is given. More information is provided in Annex 9.

Policy makers important for creating an enabling environment for interdisciplinary PhD research on complex development issues include different types of governmental organisations, such as:

- the Ministries of agriculture, economy, planning, education, and development cooperation in the North and South;
- governing bodies of higher education and research institutions;
- directors of rural development institutions and project institutions;
- funding organisations;
- ERA-ARD managers.

Policymakers can play different roles in development related research. They can be the funder of interdisciplinary research programmes, they can be the client demanding for specific results for their policy making process (such as for setting the research agenda) and they can be partner in the research programmes (as highlighted during our discussions on participatory approaches to be used to enhance relevance of the interdisciplinary PhD research and to produce tangible outcomes). Sometimes, policymakers play different roles at the same time. For instance, the Dutch Ministry of LNV is an important funder and client, and sometimes partner, for research executed by Wageningen UR.

A strong coalition between researchers and policymakers is a requisite to tackle the complex development issues at stake. Neither the scientists, nor the policymakers can solve the problems alone, they need each other.

Taking into account the specific roles that policymakers and scientists have to play, they have to agree on a number of aspects to enhance interdisciplinary and participatory research, like:

- innovations in development oriented research need new scientific approaches and policies to contribute to solutions that all stakeholders are looking for;
- the importance of the type of systems research and systems objective-oriented research, initiated by problems that come up in the course of action, directly aiming at innovation;
- the involvement of the various stakeholders in interdisciplinary and participatory research projects;
- interdisciplinary research is a long term and a difficult process, demanding a huge investment in time and resources compared to more mono-disciplinary research, and that needs special support to make it successful;

- development oriented research in North-South partnerships demands also institutional capacity development in Southern countries and twinning the research capacities in these countries.

4. Final remarks

4.1 Some conclusions

The workshop of 1.5 day was the first occasion for researchers from 7 European countries and colleagues of 3 African countries to meet and share experiences with interdisciplinary PhD research programmes in which they are involved. During the presentations and discussions some generally supported ideas emerged concerning interdisciplinary research.

Addressing complex, development related societal issues requires interdisciplinary and participatory approaches. The combination of various disciplines within a programme approach, and involvement of the relevant stakeholders, will focus the individual PhD projects and will increase the chance of producing tangible outcomes. It is not expected that the individual PhD project will have a direct impact, but the results produced will be brought further by the staff involved in the programme or by post-PhD projects to ‘translate’ the scientific results into better applicable knowledge.

Different models for interdisciplinary PhD research programmes have been presented and discussed. A one size fits all model probably does not exist. In general, however, the following figure gives the (flexible) model the participants agreed with.

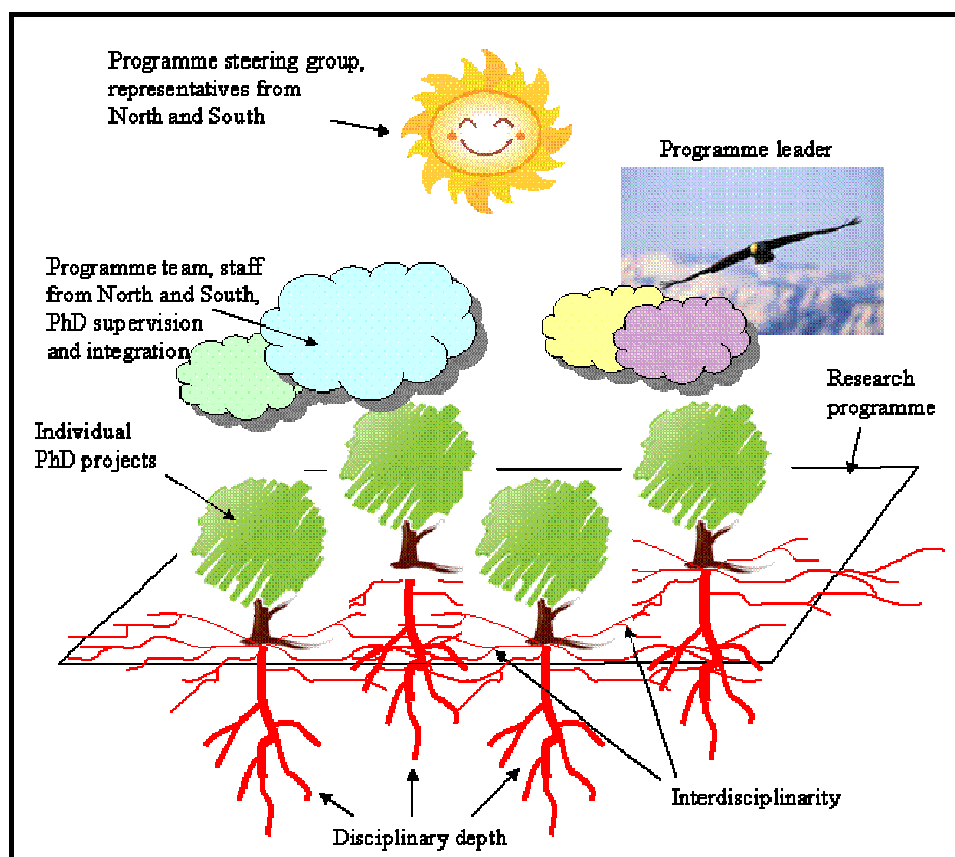


Figure 1 Schematic organisational model for an interdisciplinary PhD research programme

The trees are the individual PhD projects within the context of a programme or working in the same physical area, addressing a complex societal issue. The deep roots of the trees represent the required disciplinary depth of the PhD research; the lateral roots indicate the interdisciplinarity at the programme level. Depending on the philosophy of the research programme, the deep roots can be less deep, and the lateral roots can be more important. The clouds represent the staff involved in the programme, responsible for the (shared) supervision of the PhD students and the integration of the results produced by the individual PhD students. The eagle represents the programme leader. It is proposed that the programme leader is not involved in the supervision of the PhD students or has other (financial) interest in the PhD projects. The sun represents the programme steering group with representatives from North and South.

Interdisciplinary research projects are more time and resource consuming than mono-disciplinary research projects. To tackle complex societal issues, interdisciplinary and participatory approaches are necessary. Institutional limitations, however, do not favour this kind of research programmes. Researchers and policymakers have the task to create an enabling environment to stimulate the development of interdisciplinary and participatory research programmes.

4.2 Future perspectives


The workshop concluded with an outlook of how to proceed. There is a high commitment by all present to keep working on interdisciplinary PhD programmes (despite the challenges involved!). There was thus an agreement that we need to keep in touch and work together to better communicate the potentials of interdisciplinary PhD programmes as well as the specific needs involved to ensure excellent results.

- Interdisciplinary research will become more important in the near future. Various universities world-wide are advocating interdisciplinarity, not only in development oriented domains.
- During the workshop, the different approaches and experiences were touched upon, but not discussed in detail. It will be good to keep in contact to learn more from the different efforts.
- It would be desirable to build a European platform to exchange experiences in interdisciplinary PhD programmes. Such a platform might also allow us to build a ‘community of practice’ to strengthen the capacities for interdisciplinary approaches at European level and the complementarity between the different European countries. One of the first activities of the Platform could be to write a common article on the shared experiences. As such, the Platform can also function as a resource base for other groups who start using interdisciplinary approaches.
- The Platform can also work on a clearer message: in which circumstances is holistic / integrated / interdisciplinary research more promising than disciplinary work? What is the added value of interdisciplinary work? Make clear that interdisciplinarity is a research approach, a platform. Interdisciplinarity will enable us to tackle complexity, interconnection, uncertainty and multi-level processes.

Bi-lateral contacts between interdisciplinary research groups and scientists have been established during the workshop. It will be interesting to know how the establishment of the European platform as proposed can be supported by the ERA-ARD project.

Annex 1. Quality of Interdisciplinary Education; ZEF's perspective

Paul Vlek, Zentrum für Entwicklungsforschung (ZEF), Germany

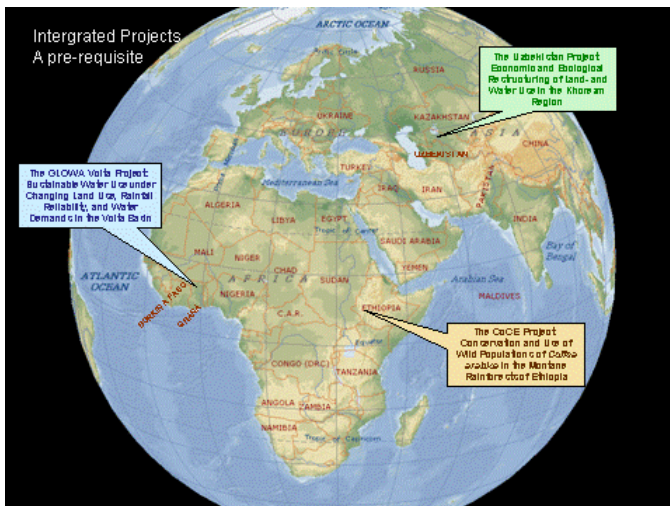
 Zentrum für Entwicklungsforschung
Center for Development Research
University of Bonn


Quality of interdisciplinary education

- ZEF's perspective -

Paul L.G. Vlek

ERA-ARD Workshop on
Sharing of Experiences between interdisciplinary PhD research programmes
related to agriculture and rural development
Wageningen Dec. 11-12, 2008



 Zentrum für Entwicklungsforschung
Center for Development Research
University of Bonn

Quality of Education

1. Quality of collaboration: General prerequisites
2. Transparency in project management
3. Building of mutual trust
4. Organization of communication

1. Quality of collaboration

Mental

- Mutual understanding that project partners of different disciplines have the same interests, are on the same playing field and on the same page
- There has to be chemistry between the partners
- All Ph. D. Students develop ownership of the project

1. Quality of collaboration

Organizational

- Establishment of interdisciplinary management teams
- Cross disciplinary mentoring at all stages of Ph. D.
- Long-term commitments (ZEF's major projects: 7-12 years)

1. Quality of collaboration

Conceptual

- Clear research objectives and designation of research role among interdisciplinary peers
- Common sampling frames improves a students understanding of the needs and requirements of research partners
- Building of a network (e.g. ZEF alumni network)

2. Transparency in project management

Students are involved in management issues

- Project plan as common platform for all project members, incl. Ph. D. students
- Project proposal and annual reports are available for everybody (on web page).
- Binding agreements (Memorandum of Understanding)
- Important management decisions are made involving all disciplines

2. Transparency in project management

Financial issues

- Budgets are transparent to leading project members
- Distribution of financial resources according to the project plan..... adjusted for delays and shifts

2. Transparency in project management

Communication

- Regular staff meetings are held in Germany and in the study region
- Meeting protocols are shared
- Meeting of working groups to outline project goals and time line

3. Building of mutual trust

Project implementation

- Joint interdisciplinary course to learn common language
- Frequent visits of the project coordinators to field sites across disciplines
- Joint presence of Ph. D. Students in the study region (no "safari-science")
- Short and long-term stays of partners in Germany (exchange of scientists)
- Training of project members

3. Building of mutual trust

Research

- Strong focus on doing research with doctoral students in teams
- "Tandem system" for doctoral students (one from Germany / one from cooperating institute in the study region)

4. Organization of communication

Individual

- Face-to-face contacts among students
- Project coordinators promote communication
- Project coordinator asks for feedback from partners
- Regular extended visits of senior project members

4. Organization of communication

Meetings

- Regular staff meetings are held in Germany and in the study region
- Meeting protocols are shared
- Workshops, conferences and status seminars conducted alternately in Germany and in the study region

4. Organization of communication

Infrastructure

- Establishment of communication infrastructure (telephone, fax, and computers with email and internet access) in the local project office
- All project partners have access to central data bases

4. Organization of communication

External

- Writing of joint papers
- Web page, flyers, events, etc. (with professional support and input: good researchers are not necessarily good communicators!)

1. Transparency in project management

Questions

- Should all partners/disciplines have the same rights (and duties) in decision making regarding project management and budget?
- What are efficient ways to make project issues transparent?

2. Building of mutual trust

Questions

- How should potential Ph. D. students be introduced to the project (partners)?
- What can be done to build up mutual trust among the disciplines of the project?
- What can be done to maintain mutual trust during project implementation?
- Which formal structures in a project help shared learning?

Annex 2. Interdisciplinary PhDs: an experience from NRI-UK

Alistair Sutherland, Natural Resource Institute (NRI), United Kingdom

Background to NRI

NRI was a formerly part of the UK Overseas Development Administration (ODA) and as part of privatisation was absorbed into University System in 1996 when it became part of the University of Greenwich. Following this NRI re-structured under thematic interdisciplinary groups. Many staff had long experience of Ph D supervision under co-supervision arrangements and in 1997 when NRI became a University School it was able to award its own PhDs and MScs and shortly afterwards set up an M Sc programme. It will offer a B Sc programme next year.

All Ph Ds, whether inter-disciplinary or “mono-disciplinary” undertaken are set within the context of addressing a specific developmental problem, usually through the application of technology. From the late 1990s more of the individual Ph Ds crossed over disciplines due to the applied emphasis of the research projects and it became common to have joint supervision by a natural scientist and social scientist. An “interdisciplinary Ph D” is one where the student crosses over disciplines for a significant part of the research and combines both natural and social science elements within the Ph D. While this type of Ph D is quite common in NRI, there is no formal “interdisciplinary” Ph D programme – they “just happen.”

As NRI does not receive any core funding and generates its revenue through research and consultancy the Ph Ds are usually funded as part of a research project, or by individuals who obtain their own funding or fund themselves. While there is greater emphasis on demonstrating that a Ph D delivers a set of core competencies within the UK university system, there is still no required taught course component within a Ph D programme. The views of NRI staff on the value of PhDs vary, depending on their particular experience and orientation, and probably around half of the staff is involved in some way in Ph D supervision.

What Has Enabled Inter-Disciplinarity in NRI?

Enabling conditions can be divided into those largely external to the organisation, and those which are part of its internal make-up, or internal to the candidates themselves.

External environment

From the mid 1990s donors, (DFID being the primary source of funds for research undertaken by NRI), placed increased emphasis on agricultural research that addresses poverty as well as gender and environmental sustainability. This was accompanied by emphasis on on-farm adaptation of technology and subsequently attention to markets and the wider context of agricultural innovation. The result was a demand from biophysical scientists for inputs, and in some cases partnerships, with social scientists. Research projects became increasingly multi-disciplinary, and in some cases interdisciplinary, and very often included PhDs more of which required the researcher to cross over disciplines – at times it was bio-physical researchers venturing into areas of social science, and at times the other way around. The Ph Ds were usually concealed because DFID rules at the time did not allow research funds to be used for training (probably because they wanted the research to be more applied and felt that

allowing funding of Ph Ds it would be less applied. The funding 3 year research projects, with possibilities for extensions, was conducive to PhDs being “bolted on” to applied research projects. By this time, as a result of the influence of earlier cross-disciplinary movements affecting agricultural research, including farming systems research, participatory rural appraisal and participatory research the opportunities for publishing interdisciplinary agricultural research had improved somewhat. Moreover, academics who had been involved with these earlier movements understood the value of, and were supportive of Ph Ds that crossed over disciplines and were ready to take on the external examiner role for such Ph Ds. . In this respect they were abreast with developments in other sectors (e.g. health, infrastructure) where the necessity and value of interdisciplinarity was increasingly becoming recognised.

Internal Aspects

Factors internal to NRI also facilitated interdisciplinarity, including the co-supervision of research being undertaken by post-graduates students (both on M Sc and Ph D programmes). The inclusion of a wide range of disciplines within the same organisation who subscribed to a shared mission made it relatively easy to develop cross-disciplinary relationships. Many of the biophysical researchers had extensive field experience, were confident in applying their knowledge to practical problems, and as a result worked comfortably with other disciplines, including less experienced social scientists and though working together on applied research projects developed friendship, mutual respect and trust. Co-supervision required a measure of flexibility, including both conceptual engagement across disciplinary boundaries (each with its distinctive language) and also a readiness to conceive of a Ph whose objectives could be aligned with those of a research project designed to develop and apply new knowledge within a specific context. A Ph D “bolted on” to such a project usually required that the lead supervisor ensured a thesis went into sufficient sufficient depth (usually on the biophysical side) while the second supervisor ensured that it adequately took into account the developmental context (usually on the social side). For this to work well required each supervisor to be comfortable with their respective role.

A further enabling factor was the qualities and situation of the Ph candidate. In nearly every case they had to be ready and willing to venture beyond disciplinary comfort zone, and this was usually required as part of their contribution to project implementation. Many candidates had extensive experience of working in national agricultural research institutes in interdisciplinary/teams, providing a good preparation for an interdisciplinary Ph D. Motivation was a further factor, as the candidates often worked in organisations where a Ph D was a pre-requisite for career advancement. For those wishing to undertake applied and adaptive research and consultancy then an inter-disciplinary Ph D provides a broader range of competencies than a narrower disciplinary topic.

Challenges to Inter-Disciplinary PhDs

Challenges to funding for inter-disciplinary Ph Ds began in 2003, with the winding down of DFID’s NR research programme and the focus short-term funding to promote existing research outputs, rather than longer term funding. While the content of DFID research “promotion projects” and programmes such as “Research into Use” provided valuable material for inter-disciplinary Ph Ds, addressing the broader context for agricultural innovation, efforts to solicit support for this were not

successful because fund managers were nervous to start supporting a process that risked not being completed within the time-frame. Subsequent research calls through the main-stream research councils (BBSRC and ESRC) favoured more up-stream types of research in agriculture and development – not conducive to cross-disciplinary activities such as interdisciplinary Ph Ds. The peer review system operated by these councils made obtaining funding for any inter-disciplinary work extremely difficult.

Other challenges to inter-disciplinary Ph D research, making it more difficult to get going, were entrenched views among a few staff what a Ph D is about going into depth rather than breadth, achieving a combination of supervisors who communicated effectively and did not compete over the topical focus. Another challenge is sustaining focus and boundaries, particularly when the student is given more scope to explore a complex problem involving a broad range of inter-related topics and drawing from a range of conceptual frameworks. When the problem being addressed is comparatively new, and there is limited literature available, extra effort is required to develop strong theoretical under-pinning – IAR4D being a case in point. This requires capacity for drawing in an eclectic way from a range of disparate literature.

A further challenge is demonstrating that the thesis constitutes a significantly original contribution to new knowledge, as it is likely that the research project of which the research is a part will be working to apply existing knowledge to address developmental challenges. Hence originality has to be sought in terms of the uniqueness of the context, often in combination with the further development of particular research methodologies, and hopefully in producing results and some “surprises” that suggest further promising lines of research.

Finding suitable examiners for this type of thesis remains a challenge, and if the candidate comes from a University Dept or Specialised Research Team within a national institute then it may be more difficult for them to gain acceptance of their qualification and find room within the existing curriculum or research programme to promote interdisciplinarity.

Way Forward For Interdisciplinarity in Ph D for IAR4D - What could be done differently?

The main actors involved may consider how they could do things differently.

“Hosting/providing” institutions such as NRI may consider whether or not they should provide explicit support and guidance for inter-disciplinary Ph Ds, a formal inter-disciplinary PhD programme, or specific taught courses for those crossing over from one discipline to another.

“Sending” institutions (Clients) may need to be more aware of the value (and limitations) of this type of Ph D. Do they have specific problems or research areas which lend themselves to interdisciplinary approaches – what incentives or disincentives do they have for interdisciplinarity? How easy will it be for a person who has crossed over disciplines to fit back into the sending institution – will they be valued and accepted in a single discipline department of a university or an upstream research institute? Do other types of organisation (e.g. NGOs, public extension, private sector agri-business) require Ph Ds and if so what are their needs?

Funders of research and capacity strengthening relating to IAR4D often emphasise the need for research to have developmental impact. What incentives might they provide for Ph Ds that address the areas of complexity and challenge that best lend themselves to an inter-disciplinary approach? How can they be approached to continue support for this type of capacity strengthening?

PhD Supervisors – do they need specific training or guidelines?

PhD Candidates – do they need specific preparation and counselling?

Annex 3. Scientific embedding of societal problems: the AWLAE Project (2002-2010)

Anke Niehof & Lisa L. Price, Wageningen University, the Netherlands

Introduction

This paper will present a project that embodies the scientific embedding of societal problems in several ways: the interdisciplinary PhD research programme AWLAE. First, we will introduce the project. Then we will discuss how the project contributes to the scientific embedding of societal problems. We will also briefly touch on challenges faced in the project that now seem unavoidable given the set-up of the project but that we did not sufficiently realize at the start. The authors of this paper are the coordinators and academic managers of the project³. Finally, we would like to note that the research carried out in the framework of the project can be characterized as strategic research, inspired by socially relevant questions and using theories and methodologies derived from basic research.

The AWLAE Project

AWLAE is the acronym of *African Women Leaders in Agriculture and the Environment*. It is a pan-African program that aims at training women professionals in the fields of agriculture and environment, to redress the existing gap between male and female representation in professions relating to these fields. AWLAE was initiated by Winrock International (WI) in 1989. Its headquarters are in Nairobi, Kenya.

In 2002, between AWLAE, WI, and WUR a project was formulated that was submitted for funding to the Minister for Development Cooperation of the Netherlands Ministry of Foreign Affairs. The goal of the project is to build a cadre of well-trained African women professionals working in agriculture, environment and related sectors to enhance their academic standing and capacity and to contribute to gender-relevant research and policy-making on the role of women in food systems and the gendered impacts of HIV/AIDS on food security and rural livelihoods in sub-Saharan Africa. The Ministry agreed to fund twenty PhD scholarships at Wageningen University and the additional leadership-in-change training for twenty women from eleven African countries, ranging from East to West and Southern Africa. In June 2002 an agreement was signed between AWLAE, represented by its Regional Director, and the Director of the WUR Social Sciences Group, after which implementation of the project could start.

The participating scholars were carefully selected from a large number of applications. The scholarships were widely advertised in relevant media in countries with AWLAE chapters, and the chapters concerned were actively involved in the recruitment and selection of the candidates. The selection procedure was based on two pillars: (1) relevant experience and proven commitment to the cause of women's empowerment and enhancing women's role in development; (2) proof of potential to

³ The Wageningen Project Management Team (PMT) at the start of the project comprised: Prof. Dr. Anke Niehof, Dr. Lisa L. Price, and Ir. Antine Hardon-Baars. Prof. Dr. Julia Gitobu, regional director of AWLAE, was the project director. Sadly, she died in May 2007.

successfully pursue the PhD at Wageningen University and complying with the required academic standards (including sufficient proficiency in English).

[Note: The latter requirement caused the candidates from Mali to be unable to participate.]

The following women participate(d) in the AWLAE scholarship project:

| | |
|--------------------------------------|--------------------------------------|
| Susana Akrofi (Ghana) | Mariame Maiga (Ivory Coast) |
| Hirut Bekele (Ethiopia) | Lydia Ndirangu (Kenya) |
| Namizata Binaté Fofana (Ivory Coast) | Aifa Fatimata Ndoye Niane (Senegal) |
| Joyce Challe (Tanzania) | Faith Nguthi (Kenya) |
| Fatimata Dia Sow (Senegal) | Carolyne Nombo (Tanzania) |
| Stephanie Duku (Ghana) | Regina Ntumngia Nchang (Cameroon) |
| Rose Fagbemissi (Benin) | Daisy Onyige (Nigeria) [dropped out] |
| Kidist Gebreselassi (Ethiopia) | Gaynor Paradza (Zimbabwe) |
| Monica Karuhanga (Uganda) | Corrie du Preez (South Africa) |
| Doris Kakuru (Uganda) | Ekaete Udong (Nigeria) |

Structuring the project in the WU context was done in the following ways:

- In the first place, a sandwich format was applied: the scholars would come for one year to Wageningen to do course work and develop the full proposal, then would do the fieldwork in their home country (one to two years), and after that come back to Wageningen to write the thesis. *[Note: For the French-speaking scholars two months had to be added to the first year.]*
- Second, the twenty scholars were divided into two cohorts of ten. The French-speaking women were placed in the second cohort, to give them more time to improve their English. They would come to Wageningen when the first cohort would be ready to go to the field.
- Third, the academic project managers put together supervisory teams based on the disciplinary background and topic of research of the scholars. In each team gender expertise was to be represented. Subsequently the envisaged supervisors were informed about the project and were asked about their willingness to supervise the candidate and do this together in the proposed team. *[Spin-off: More collaboration across chair groups and disciplines and – in some cases – between persons who had never worked together before.]* Our own chair group, Sociology of Consumers and Households, is first supervisor for five scholars and co-supervisor for another seven.
- Fourth, apart from the Project Management Team and Academic Advisory Committee was installed. This committee was especially important in the beginning of the project when final decisions had to be taken concerning the selection, supervision and training programmes of the scholars.

Results to date are five completed PhD theses (see Table 1). More scholars will graduate in 2009 (Kidist Gebreselassi on the 14th of January next), the others in 2010. There was one drop-out case. Additionally, scholars have published on their research in international journals. One of the scholars, Susana Akrofi, was invited for the round table with Mr. Kofi Anan when he came to Wageningen for the opening of the academic year (1st September 2008). All have presented papers at conferences and

workshops. This has increased their confidence and competence and has enlarged their professional networks.

Table 1: Completed AWLAE doctoral theses

| Name | Title | Graduation date |
|---------------------|---|-----------------|
| D. Kakuru | The combat for gender equality in education: Rural livelihood pathways in the context of HIV/AIDS (*) | October 2006 |
| F. Nguthi | Adoption of agricultural innovations by smallholder farmers in the context of HIV/AIDS: The case of the tissue-cultured banana in Kenya (*) | June 2007 |
| L. Ndirangu | Household's vulnerability & responses to shocks: Evidence from Kenya | October 2007 |
| C. Nombo | When AIDS meets poverty: Implications for social capital in a village in Tanzania (*) | December 2007 |
| M. Karuhanga Beraho | Living with AIDS in Uganda: Impacts on banana-farming households in two districts (*) | January 2008 |

(*) Also published by Wageningen Academic Publishers.

Embedded scientists

By embedded research we mean strategic research that uses scientific approaches and methods to investigate and contribute to solutions for societal problems. Researchers carrying out such research could be called embedded scientists. As researchers they are aware of their responsibility for societal advancement and their research is meant to be a service to society. Commitment to this role of embedded scientist was an important criterium in the selection procedure about which the short-listed candidates were interviewed in their own country by the board of the country's AWLAE chapter. During the scholars' stay in Wageningen the project management as much as possible stimulated and reinforced this personal commitment by arranging activities for the cohort as a whole and, in this way, providing space – literally and metaphorically – for mutual exchanges and support among the scholars. At the same time, especially during the first year, working together as a cohort instilled an *esprit the corps* and a sense of a common purpose among the scholars that could bridge differences of country origin, religion, disciplinary background, and language.

The societies involved in the AWLAE Project are those countries in sub-Saharan Africa that are characterized by a combination of societal problems. More specifically, within the framework of the project the following issues are – in one way or another – addressed:

Women's empowerment: The need for women's empowerment arises from gender disparities that result from unequal access to education, lack of attention for women's health, lack of political voice and power, patriarchal social systems, unequal access to important resources (notably land), and women's burden of care.

Feminisation of agriculture: Because of a number of factors (including male labour migration and HIV/AIDS) the feminisation of agriculture in Sub-Saharan Africa has increased, while often women have insufficient access to the resources needed for their work and are ignored by the traditional agricultural extension systems. Because

of this trend of feminisation in agriculture it is also crucial to have more gender-trained women professionals in agricultural policy positions and in leadership positions at agricultural research institutes.

Food insecurity: Due to a number of causes (effects of ill-designed structural adjustment programmes, bad governance, civil strife, environmental degradation, weak agricultural sectors, poverty, HIV/AIDS) food insecurity has increased in many African countries.

HIV/AIDS: HIV/AIDS is an urgent societal problem in many parts of especially southern and eastern Africa. The epidemic deprives such societies of their work force, depletes human capital, affects the social fabric of society and impoverishes large numbers of people. All these effects and costs are gendered. Women are not only more vulnerable and susceptible to HIV/AIDS, they also bear the brunt caring for people with AIDS and for AIDS-orphans.

The project addresses these issues in the following ways:

(1) By training the scholars and coaching them to the doctorate, the project is empowering a group of women who, because of their commitment to enhancing the role of women in development, with their title, academic accomplishments, and experience abroad, can become leaders in their country and hold positions of authority where they can make a difference.

(2) By training them in gender studies and by integrating a gender perspective in their research, the scholars can lay bare the causes, mechanisms and consequences for agricultural and rural development of gender disparities in their own country. In this way they contribute indirectly to women's empowerment.

(3) By the choice of their topics of research the scholars address key societal problems such as feminisation of agriculture, food insecurity, poverty, and impacts of HIV/AIDS. They do so in a gender-sensitive manner (in which they were trained), using validated scientific methods and theoretical frameworks that are subject to scrutiny in the academic context (Wageningen and internationally).

Challenges

There were two sets of interrelated challenges that we could have been aware of but did not realize so much at the start.

Academic versus social track record

The selection of the candidates was done in stages. From the original 300 applicants ninety were selected for further selection. In November 2002 Anke Niehof went to Nairobi to review the selection and together with Julia Gitobu select forty candidates: twenty first selection and twenty back-ups. In some cases the ranking of the selection committees (local AWLAE chapters) and Prof. Gitobu emphasized commitment to the AWLAE goals to the extent that academic requirements were not sufficiently met. There was some fierce discussion on some cases, but Prof. Niehof had to make clear that the preference of the selection committees could not be honoured when the preferred candidate would probably not be admitted to the PhD programme at Wageningen University. If academic criteria would have been the only ones, the selection would have been different in some respects. So, we had to compromise.

Women professionals becoming students again

Because of the requirement of relevant experience and proven commitment to the AWLAE cause the average age of the selected women proved to be significantly higher than that of Wageningen PhD students in general. For some of the scholars it was difficult to adjust to academic life and the role of student again, when in their own country they were well-known and respected personalities and professionals. One of the woman is an official tribal chief and had to go back to her country a few times because of responsibilities ensuing from this office. Getting back to the study was for some, especially those for whom it had years since they were at the university, not easy.

Twenty women, wives and mothers

When you have twenty women in a project you can expect some of them to get pregnant. We had six AWLAE babies in the project. We have the strong impression that in at least four cases the pregnancy was not an accident but deliberate, to appease the husband with the long absence of his wife and tie the husband closer to the family. Pregnancies and babies naturally led to delay. One of the scholars now has her youngest child here in Wageningen and has arranged for day care herself, while her husband is taking care of the older two. All women have their families at home and find it very difficult to be separated for so long. Some of them were also anxious about their husband's fidelity, especially in countries where extra-marital sexual encounters entail a high risk of HIV-infection. Three women are lone parents. All scholars personally experienced all kinds of problems related to their gender roles as wives (one woman was divorced by her husband because of her PhD studies) and mothers. The fact that they know in theory why they have these problems does not make it easier to solve them in practice.

Concluding notes

As feminists have always said: the personal is political and vice versa. We could say: the academic is personal. The fact that the twenty women in their PhD studies struggle with all kinds of problems that male PhD students would have to a far lesser degree shows that academic life and achievements are far from gender-neutral. For the women additionally applies that they are studying problems in a scientific way that come very close to home (gender relations, HIV/AIDS) and interfere with their academic studies.

For us as project managers these challenges gradually surfaced, and for us too it applied that knowing in theory is different from dealing with it in practice. The project duration had to be substantially extended because of almost all scholars require(d) more time than originally anticipated. Fortunately, the sponsor (Ministry) has shown consideration and understanding of the gender-specific features of the project. For solving their personal problems ensuing from their roles as wives and mothers, the scholars would appeal to our support and expect it, since "this was a project about gender". The research projects we are involved in as supervisors thus to us are more than just academic work. They are part of a project that requires a personal commitment from us to the AWLAE cause and to supporting the women in achieving their goals. In this way, to us the work we are doing in the project as academic managers and supervisors can be called *public sociology* (Michael Burawoy), a branch of sociology that explicitly acknowledges social issues and inequities as the primary inspiration for academic work.

Annex 4. Experiences with interdisciplinarity in the Convergence of Sciences programme⁴

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Introduction

The first phase of the Convergence of Sciences programme (CoS) addressed the sub-optimal impact of science on the livelihoods of resource-poor farmers in West Africa, particularly in Benin and Ghana where it operates. CoS aimed to develop insights into the *pathways* through which investment in science and technology can improve rural lives. To this end, CoS featured participatory experimental and action research by eight PhD students, who each developed technologies and institutional arrangements with groups of farmers. The ninth PhD student carried out comparative ‘research on agricultural research’. How did CoS try to zero in on the small windows of opportunity West African farmers face? How did it manage the ensuing issues of transdisciplinarity, and of interaction among students, (social and natural science) supervisors, and other key stakeholders? How did it face up to the issues that arose with respect to scaling up? One of the most interesting aspects of CoS is that it not only dealt with technical innovation *within* the constraining institutional and policy framework conditions, but also experimented with incipient ideas about how to *stretch* them.

Inter- and transdisciplinarity

Trans-disciplinarity combines stakeholder participation with interdisciplinarity (Tress *et al.*, 2003). Convergence in CoS means both, interdisciplinarity, especially between social and natural sciences, and science as a multi-stakeholder process. In this process-driven science, social and natural science disciplines work together to create new knowledge, modes of thinking, and theory. A typical example of the integration of life, earth and social sciences is the work of one student who not only experimented with farmers on low external input agronomic practices for sustainable cocoa production, but also has mobilized a district consortium to deal with the common practice of doctoring weighing scales by Licensed Buying Agencies. In other words, CoS student researchers not only experimented with farmers to develop technologies, they also sought to intervene in social arrangements to create human activity systems that improve the conditions small-scale farmers face. Other examples include the negotiation of agreements between landlords and immigrants about sustainable soil management, and the development of an organic cocoa chain. We dealt not only with an integration of life, earth and social sciences for understanding, but also for action. CoS experiences suggest that it might be possible experimentally to tackle the restricting and rapacious framework conditions farmers face and to improve farmers’ countervailing power.

PhD students and inter-disciplinarity

CoS chose to reach its objectives through the recruitment of PhD students because they were expected to be highly motivated, eager to publish, to contribute to university scientific output, and to be relatively cheap. CoS has not been disappointed in these expectations. Because CoS goals could only be achieved through an

⁴ Hounkonnou *et al.*, 2006

interdisciplinary effort, it recruited four students with a natural science and five with a social science background. The initial idea was that they could work in tandem in the field, one of them focusing on socio-economic aspects and the other on technological innovation. However, eventually the choice was to go for 'polyvalent' students being able to handle both disciplines. During the six months of preparation in Wageningen, polyvalence was pursued by giving the natural scientists training in subjects such as '*Methods and techniques in social scientific research*', and social scientists in subjects such as '*Ecological aspects of agricultural systems*'. Back in Benin and Ghana the students carried out research with farmer groups focusing on the following themes: crop diversity in sorghum, cowpea and yam; integrated pest management in cocoa and cotton; weed control in maize and sorghum, and improvement of soil fertility in various cropping systems (cassava, cowpea, pigeon pea, seed melon (*egusi*) and maize). The validity and appropriateness of these themes was verified in the diagnostic studies. As said, the students concentrated not only on technological improvements, but also on socio-economic, cultural and institutional innovations. This requires interdisciplinary research, and each student was supervised by both natural and social scientists, from both their own country and from the Netherlands.

Universities and interactive science

The universities lack an organization to work according to interdisciplinary or transdisciplinary lines. The discipline-based system remains the organizational form of science, even if nature sets no frontiers. According to Brewer (in Tress *et al.*, 2002) "The world has problems, the university has departments". So the challenge for universities is to institutionalize interdisciplinary training programmes, and to allow, facilitate, fund and stimulate interactive research. Courses tackling these issues in agriculture do not exist and need to be elaborated, using experiences gained in the CoS programme. Often the questions proved very practical. How to register a student engaged in interdisciplinary or trans-disciplinary research? At WU the graduate schools involved (one dealing with social sciences, and the other with natural sciences) have no rules. The students were registered in the graduate school that related to their original discipline. However, some 'social science students' focused more on natural sciences than on social sciences, and *vice versa*, so this is not a satisfactory situation. Registration in both graduate schools proved to be possible, but this only meant that students were informed about the events in one graduate school while the responsibility remained with the original school. In the University of Ghana registration proved to be difficult because natural and social sciences are hosted at different faculties. Again there was no satisfactory solution to host the CoS students. Also, to meet the requirements of some faculties, students sometimes needed to pass exams in extra subjects that had little relevance to their work. Therefore, discussions in this university started about setting up an interfaculty dealing with integrated studies or interactivity in research and education. It shows that interactive research becomes a lever to change institutional patterns. The disciplinary organization of universities could be considered as an impediment to interdisciplinary research. At WU, for example, CoS dealt with three different administratively separated expertise groups: the social, the plant and the environmental sciences. Also the graduate schools are organized according to disciplines. This means that interdisciplinary research will only happen through the personal interest of researchers or through outside stimuli such as research opportunities created by funding bodies, either within or outside the university. WU made a special effort to stimulate interdisciplinary research. At the start of the millennium, its Executive Board decided to continue working in

developing countries with as main objective interdisciplinary and comparative research focused on development and education. The Interdisciplinary Research and Education Fund (INREF) was launched and CoS was one of the selected programmes. But one pilot project does not mean that the university as a whole is able to work in an interdisciplinary manner. In fact, incentive systems increasingly drive departments into keeping their students to themselves and discouraging them from buying education or supervision from other departments. In that sense, CoS has not had any influence in WU, even though at project level supervisors from different backgrounds have entered into exciting discussions and have learned to appreciate each others' viewpoints.

Inter-university PhD degrees

Discussions dealing with creating institutional space for beta-gamma interactive research and training started at a high level in both African universities. But the problems are especially evident at the very practical level. To play safe, students were registered at both the northern and the southern universities, while solutions were being negotiated. Procedures, regulations and maybe institutional pride have proved too strong for the deliberate efforts of CoS to make inroads. CoS tried to stretch the limits of the regulations, which resulted in permission to organize the WU PhD defense outside the Dutch borders. This was quite a rare event in the history of WU.

Conclusions

CoS developed, tested and published protocols for zooming in on farmers' small windows of opportunity and for establishing effective interfaces between scientists and farmers that allow research to make a contribution. So CoS seems to have succeeded in its main objective: to design pathways by which agricultural science can have an impact on livelihoods of small-scale farmers within the conditions that farmers face. CoS PhD researchers tackled the framework conditions. At first CoS focused mainly on technical innovation. But as CoS progressed, the researchers began to tackle institutional issues that constrain agricultural development, such as ineffective commodity chains, cheating by produce buyers, and land tenure arrangements. This (action) research is to some extent able to enlarge the windows of opportunity.

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Further reading

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Annex 5. Models for effective organisation of interdisciplinary research

Gertjan Becx, Wageningen University, the Netherlands

This text and the presentation are part of research done for a thesis in 2006. The full report is available on request. (gertjan.becx@gmail.com).

Wageningen University has a long tradition in doing internationally oriented interdisciplinary research (IR), often used to generate applied science that helps solving complex, multidimensional problems. However, how collaboration and integration between distinct disciplines can be put in practice is not always clear. In this piece, I wish to describe the different organisational frameworks that can be used in IR and reflect their strengths and weakness. Other highly important factors influencing the quality of IR like Research Culture, Scientific and Societal output and external factors will not be taken into consideration, in this piece but have been considered in the full report. Necessary data were gathered through literature review, interviews with Wageningen scientists involved in first round INREF programmes⁵ in 2006.

Designing a program; choosing an (organisational) model. The organisational model of an IR program can be considered as the infrastructure. It determines the way the research is structured, the division of tasks and the planning in time and space. Rossini & Porter (1979) provide a comprehensive overview for the organization of interdisciplinary research based on 24 observations. They present four ideal types of integrating interdisciplinary research: 1) common group learning; 2) modeling; 3) negotiation among experts; and 4) integration of research by a leader (Figure 1).

Common group learning

In this organizational model the research output reflects the common intellectual property of the entire research group. After the problem definition, the research is divided into areas based upon the expertise and interest of the members of the research group. Subsequently, the input of the members is discussed and evaluated in the group and rewritten. This procedure is repeated until the team is satisfied. According to Rossini & Porter (1979), this type of research is only suitable when research teams are small and when there is a need for broad rather than deep research. Common group learning is being used for the interdisciplinary project of WU's North-South Centre on Global Food Availability (2004-2006). The INREF financed Convergence of science (COS) programme shows elements of the common group learning model as well. This project consists of a number of PhD students that combine sociological and agricultural methods in their studies. The specific methodology is the result of intensive debates between social and natural scientists, field trips and interdisciplinary workshops. The entire team formulated the goals, and these were changed radically during the program. PhD students performed

⁵ The following projects were included: Optimisation of nutrient dynamics and animals for integrated farming (POND); Agro-industrial transformations towards sustainability (AGITS); Healthy people: Food-based interventions to alleviate micronutrient malnutrition (FNRHP); Convergence of science (COS); Regional food security policies for natural resource management and sustainable economies (RESPONSE). In total 16 PhD supervisors, 14 PhD students, 3 programme coordinators and 1 INREF staff member were interviewed.

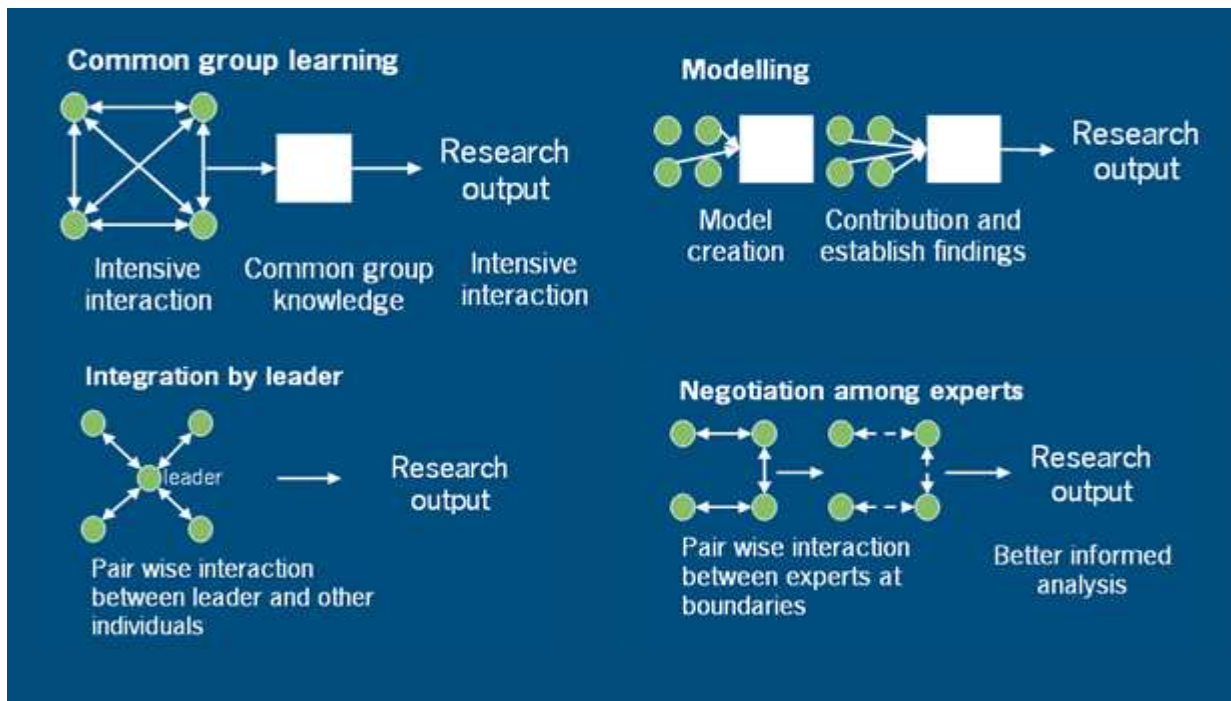


Figure 1 Visualisation of models of organisation of Rossini & Porter (1979)

diagnostical studies to adapt research questions to practice. However, reconfiguring the research took so much time that no resources were left for a proper integration of the distinct PhD projects. Therefore, the final product will be a selection of individual interdisciplinary PhD theses and articles instead of an integrated study.

Modelling

Another organisational approach is the combined scientific work on a model. An important drawback of modelling is that this technique can best be applied in a rather narrow range of closely related disciplines. None of the INREF projects used this form of organisation. The, predecessor of REPOSE, the sustainable land use program (DLV) can be considered as one. Interdisciplinary models should be transparent, understandable for all members, and rapid prototyping should be used (Nicolson et al, 2002). A major problem in the Wageningen context is that Wageningen sociologists dispute the validity of the system approaches that are often used for modelling agricultural systems. A possible solution is the use of models that combine valuable insights from the actor-oriented approach with system approaches like multi-agent modelling (Berger, 2001; An et al, 2005).

Negotiation among experts

In this organisational model, the task division among the members of the team is based on their individual expertise. Integration takes place by negotiation between team members. This type of research is highly suitable for large studies with considerable depth. However, it can lead to less integration (Rossini & Porter, 1979). The INREF funded Agro-industrial transformations toward sustainability program (AGITS) is organized like this. The coordinator of this project told that the result of the program would be a set of loosely integrated, rather disciplinary reports.

Integration of research by a leader

This organisational framework is considered effective for small research teams. The method is based on a division and allocation of parts of the problem based on members' expertise and later integration. Here, the multidisciplinary risk is clearly visible. The INREF funded programs POND, FNRHP and RESPONSE used this organisational model. Nonetheless, this was not without difficulties. The post-docs that were appointed by the POND and RESPONSE program quit, leaving their programs without an integrating force.

Another organisational factor concerns the planning of the project. Main issues are that enough time is taken in the planning period of the program and that program planning should be flexible and adaptive. A special feature in many Wageningen programs is the timing. Much design oriented research requires a chronological order; implying not all disciplines can start at the same moment. This problem can be tackled by increasing the length of the programs and by using planning tools, from industry, like network planning. Besides the social environment, shaping the right physical environment is also essential in IR. The same research area and the same research objects should be chosen. The latter was done in most projects but the first in none of them.

In the organisation, the different team members have different tasks. Post-docs, supervisors, and PhD students are separately discussed. Most of the interviewed IR scientists draw attention on the importance of a good programme coordinator. While interviewing scientists involved in IR and reading literature, we collected a striking amount of qualifications that a team leader must possess to deal with the complexities of managing IR. These will be discussed during the presentation.

Overall

All four ideal types to integrate interdisciplinary research: 1) common group learning; 2) modelling; 3) negotiation among experts; and 4) integration of research by a leader are present in Wageningen. When designing a project choosing the right organizational model and communicating with team members about the model and the implications of this choice are essential for success.

Annex 6. Models and approaches for inter- and transdisciplinary PhD research in North-South partnerships

Stephan Rist, University of Bern, Switzerland.



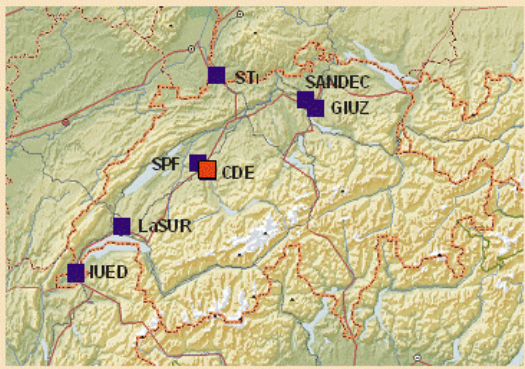
NCCR North-South' three long-term objectives

The 10-year programme has 3 long-term objectives:

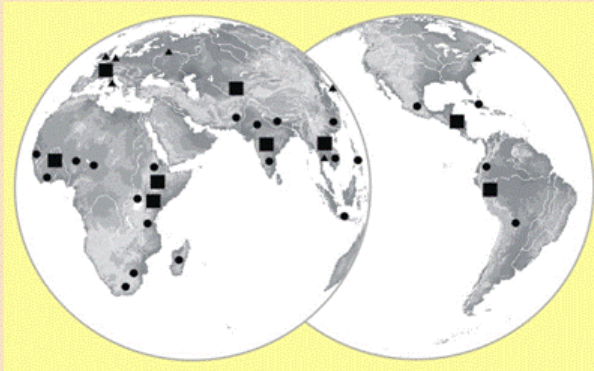
- (a) To further **disciplinary, interdisciplinary and transdisciplinary** research aiming at sustainable development;
- (b) To help **strengthen institutions and train staff** in partner countries to build competence and capacity for developing socially robust knowledge for mitigation action;
- (c) To **support the societies of partner countries** and their institutions in their efforts to address the syndromes of their regions autonomously.



7 Core partners in Switzerland



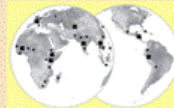
165 Southern Partners in 27 selected countries



The 11 Principles of Research Partnership

(Source: K FPE Science Commission for Research Partnership with Developing Countries)

1. **Decide on the objectives together**
2. **Build up mutual trust**
3. **Share information; develop networks**
4. Share responsibility
5. Create transparency
6. Monitor and evaluate the collaboration
7. Disseminate the results
8. Apply the results
9. Share profits equitably
10. **Develop research capacity**
11. Build on the achievements



Kind of development & knowledge?

Sustainable development

- Economic feasibility
- Efficient use of Natural Resources
- Long term securing of natural basis
- Distributive equity
- Participation

(Brundtland, 1987; UNCED & Agenda 21, 1992)

Operationalisation

(nach Hirsch Hadom et al., 2006)

Which research approach?

Hirsch et al., 2006, 2008

Organization of research programme

Practice - Mitigation - Policy advise

Concretisation

JACS PAMS

Better understand and act upon Sustainable Development

Specialisation Application

WPs TP

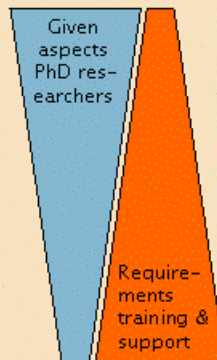
Generalisation

● 152 PhD; 58% South

Theory - Academic Communities

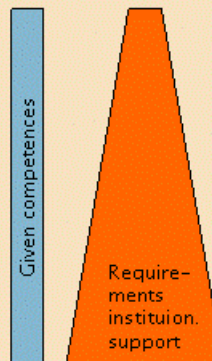
Critical issues – Personal level

1. Sound disciplinary knowledge
2. Knowledge about institutional embedding of PhDs (approach, roles, responsibilities)
3. Skills for communicating and interacting with other disciplines
4. Knowledge of epistemic, ontological and methodological potentials and limitations of own and other disciplines
5. Knowledge and experience for communicating and moderating science-society interfaces



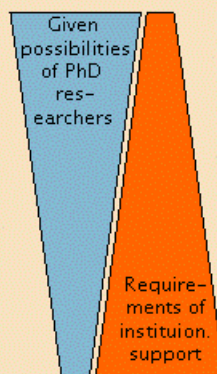
Critical factors – Supervision

1. Links between **PhD, post-docs, seniors, supervisors**
2. Articulation of **system knowledge** (core of PhD) with corresponding
 - target knowledge
 - transformative knowledge
3. Shift from supervision to **coaching** of learning processes of PhD and other actors

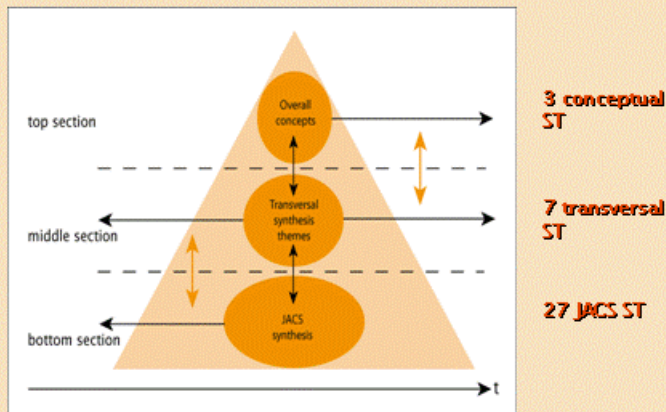


Critical factors – Institutional level

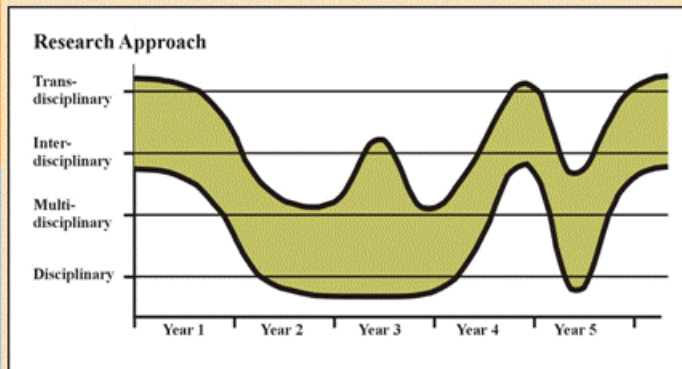
1. Facilitate PhD networks
2. Links between PhD, post-docs, seniors, supervisors
 - **ITC/RTCs**
3. Assure embedding of PhD in relevant local - regional institutional contexts
 - **JACS**
4. Use of complementary financial & human resources for bridging needs of research and other stakeholders involved
 - **PAMS**



Post-PhD synthesis: Society – science interface



Gaps institutional and PhD temporalities



Inter- & Transdisciplinary Research Skills

Communication between scientific disciplines

Communication between science and society

Attitude and communication skills required in inter- and transdisciplinary (i/d/t) research are not necessarily available after six years of disciplinary university training.

In the ITC we therefore focus on additional skills, such as:

- a reflective and critical attitude toward one's own discipline, knowing its potentials but also its limitations, and being able to question one's own standpoint
- an open, tolerant, and respectful attitude toward other scientific disciplines, the ability to manage conflicts of interests
- an open and trustworthy attitude towards non-scientific stakeholders; and
- understandable communication

Annex 7. Use of PhD research in practice; views based on PAU PhD program experiences

Conny Almekinders, Wageningen University, the Netherlands

Introduction

In this contribution, I focus on PhD research in the arena of social sciences⁶, development and change. The experiences are mostly from PhD projects of candidates from developing countries with sandwich scholarships. The intention of the text is to stimulate discussion among participants of the Workshop “Sharing of experiences between interdisciplinary PhD research programmes related to agricultural and rural development”, Wageningen, 11-12 December 2008’

Background of the PAU program and the university context

In the year 2000, Technology and Agrarian Development (TAD), WUR obtained financial support from the Rockefeller Foundation for a special PhD program. Eventually this resulted in grants for 24 sandwich scholarships and special activities. TAD recruited for the program over a period of four years (2001-2004), four cohorts of 6 PhD researchers each. The majority of the recruited PhD candidates were researchers with an MSc level natural science background, and working in international and national agricultural research institutions and universities in East and Southern Africa.

The research theme and PhD candidates

The thematic scope of the PhD program was ‘Participatory Approaches in agricultural (technology) development and their Up-scaling’ (PAU). Since the Rockefeller Foundation had been supporting many projects and institutions in the application of participatory approaches in agricultural technology development, they were interested in understanding which participatory approaches worked best and how they could most effectively be scaled-up to reach more farmers in a shorter period of time with the benefits of agricultural research. The research in the PhD program would be instrumental in giving answers to those questions. Most recruited researchers had some years of professional experience in projects that applied participatory approaches. Participatory research with farmers was for most of them part of their job at home and presumably their PhD research would involve similar work. Thus, as PhD researchers they would not only study participatory approaches as a subject, but many of them would also be part of it as member of a project or research team – during their PhD research and/or thereafter.

The research in this program should be considered in the context of the general call for more practice-relevant research that combines with direct impact, and which researchers would play a new, different role (e.g. German & Stroud, 2007). To address farmers’ problems, and rural societal needs at large, these researchers should break away from the paradigm in which generation of knowledge is seen as an exclusive activity of scientists. This call is voiced particularly strongly on the African continent where the labels like Innovation System approaches (Sanginga et al, 2008) and IAR4D (Integrated Agricultural Research for Development) are attached to it (ICRA/Natura, 2003, Starks et al, 2005). This research is an applied type of research,

⁶ Referring to the qualitative strands in social sciences - not including economics

asking for interdisciplinary approaches to be integrated into frameworks for participatory learning and action research. In this article we refer to such research as ‘integrated agricultural research’. Academics who carry out this research are expected to be effective team players, able to handle complex situations with the involvement of multiple-stakeholders (Chambers, 1997, Patel et al, 2001).

PhD training

While the call for this new type of scientist is fairly loud, less attention has been paid to the competences that such researchers should be equipped with (Levin and Martin, 2007) and how these competences can be developed (Patel et al., 2001, Kibwika, 2006). To this end - in addition to training the PhD candidates in the conventional academic competences - the program piloted competence development that emphasized human interaction, communication and collaboration as part of the curriculum. This involved a range of cross-cutting social skills, the related deeper understanding of human (and one’s own) behavior and values, and how these play a role in research work, in particular interdisciplinary research⁷.

Experiences with impact oriented PhD research

Interdisciplinarity. PhD candidates in the programme are stimulated to carry out different forms of interdisciplinary PhD research, with the underlying reasoning that complex problems of participation, agriculture and development cannot be properly understood by studying them from one single disciplinary perspective, nor by focusing on one single system level. The entire complexity of the landscape needs to be taken into account. To develop a proposal, carry out the research and write the thesis the PhD candidates receive training. This training trajectory concentrates on knowledge and skills for the research. The training is mostly packaged in disciplinary course modules. Possibilities for training in two disciplinary fields are limited and there is marginal space for developing skills that specifically focus on ‘the interdisciplinary’ character of research. As a result, most individual PhD projects in our programme cut out a part of the complex landscape, albeit in most cases using an interdisciplinary approach, combining natural and social science methods and analytical frameworks. The collection of the (24) PhD studies together, however, paint the complex landscape, filling in the different disciplinary dimensions and system levels of the topic⁸. This means that eventually there will be a synthesis of the findings – as part of the PhD programme or thereafter.

Action-orientation. About half of the PhD studies are what we called ‘embedded’ or action-oriented studies: the PhD research means to analyse institutional change processes and participatory technology development actions of which he or she was part as member of an implementing team (similar settings and processes are described as the ‘ideal’ situations/platforms/research by Jon Daane in his contribution). This type of work is almost by definition of interdisciplinary nature. These are probably the PhD studies with most direct impact on the target group (i.e. the ‘researched’).

⁷ Experiences with this pilot will be presented in Almekinders et al. (2009).

⁸ The programme initially study ‘upscaling’ of participatory approaches in the later phase of the project. However, few promising participatory approaches and situations were found on the ground that allowed the ‘embedding’ and study of these processes to increase understanding of factors and conditions that favour wider and faster impact of participatory approaches in farmers’ fields and research organizations. Upscaling is an other area of study that can not be deduced from study of pilot projects; other factors and mechanisms at play

Experiences have shown us that these are, however, very challenging PhD studies, asking a high level of

i) competence from the side of the PhD candidate. Next to the disciplinary field(s), the action-oriented work adds an additional layer of methodological complexity and asks additional skills.

ii) flexibility in timing and funding to enable the PhD candidate to use his/her time to the action and research. Action-oriented work is less controllable and situations often do not allow 'condensed data collection' (i.e. research time yields less data). Most PhDs are set up around scholarships and arrangements with employers that have limited time and financial flexibility. This asks for research situations that are fairly well defined and controllable.

A PhD is a piece of research of an individual, accomplished within a limited time frame. Currently, PhD work is assessed— ultimately - in a defense of the thesis by academic peers, on its merits of adding to the body of scientific knowledge⁹. To achieve the production of new knowledge in a relatively short time by a researcher-in-training (a PhD candidate) is most effectively done by focusing on a single discipline only, and at best marginally taking along another discipline. The data collection and analysis of processes in retrospect are the least risky in terms of data production. Interdisciplinary adds to the complexity of data collection and analysis. Action-orientated research increases the risk of ending up with insufficient data within the set time-frame. In other words, interdisciplinary action-oriented PhD research is not feasible for most candidates in most of the current PhD-scholarship set ups.

Using the PhD research in practice

If PhD work is currently not the best suited format for doing interdisciplinary and action oriented research, what are the possibilities for use of PhD research findings in practice? For the use of individual PhD findings in practice, i.e. to improve real life complex situations, three phases are essential:

1. Integration and synthesis, for example when the research is mostly disciplinary and findings need to be combined with insights from other disciplinary studies or studies carried out at other aspects of the same issue.
2. Translation of the research findings into the 'language' of practitioners (design-oriented, and adapted vocabulary) and policymakers (policy implications, and adapted vocabulary).
3. Application of the findings (and their translation into design propositions) in (other) contexts.

Currently, none of these three phases are usually parts of an individual PhD training and research: as mentioned, they ill-fit the time limitation and individual character of PhD projects.

The first phase could take place at the level of a (PhD) research programme level, with involvement of senior researchers. This asks however additional time and financial resources, either within or in addition to the individual PhD projects. It is a

⁹ A PhD researcher's thesis, which was qualified as 'good' by the natural science parties, and 'good' by the social science parties in the defense, was (only) 'good' as an interdisciplinary study. It shows that for interdisciplinary research, a PhDer needs to master the tricks of two trades, and be able to integrate them. Action oriented work adds even more complexity to doing good research.

challenging phase, but can be accommodated in academics. It can be accommodated within individual PhDs if time and capacity of the candidates allow. The next phase, the *translation* and (wider) application of the findings in the outside world by practitioners and policymakers, is indispensable, maybe even more for social sciences than for natural sciences. This phase does not fit the demands of academics: ‘translation’ of findings and their distribution does not create new knowledge. In any case, appropriate journals and other communication channels are essential for bridging this gap with the practitioners and policy makers who apply the findings in the real world.

Finally, ‘*application*’ of findings takes place outside the academic world, on the basis of designs. The application assesses the designs by solving problems or changing situations. However, application phase usually not involving academics - although it also generates new knowledge. This knowledge is necessary to improve or fine tune the design. Framing the application phase as research – in order to capture the knowledge emerging from the application in a systematic way - implies a form of action research. As outlined above, this type of research asks more time, additional skills and arrangements that are less controllable and more risky in terms of academic output. As argued, this is difficult to achieve within a PhD formula. Also for senior researchers, this represents a research approach that is difficult to accommodate with an academic position; few social scientists in the Dutch academy successfully cope with the additional conditions. The most successful documentation of action research in the social sciences is done by professionals who reflect on several years of professional involvement and are able to bring the analysis up to an academic level. They usually do not work with a scholarship and their PhD work has other time frames. From this it follows that in the current academic set up, social science research largely functions as the conventional model of linear transfer of knowledge. Possible changes in the academic set up and mandate have likely been discussed earlier in this workshop.

Opportunities to explore

Apart from creating space in the PhD training and research for interdisciplinarity and action orientation, universities like WU could think of:

- Each PhD student could be asked to submit in his/her thesis a translation of his/her findings as a requirement similar to having an abstract and education certificate.
- Creation and use of journals and other communication channels for sharing translated research findings with the potential users, i.e. wider non-scientific audience of practitioners and policy makers. Think for example: ILEIA Newsletter, CTA Spore, internet-based options like short video clips (work of Van Mele and others). A University/WUR-based outreach communication programme could be an effective communication channel as well (paper, internet, tv and radio). The role of scientific journals like NJAS Journal of Life Sciences needs to be considered.
- Establish long-term stable relations with suitable partners, e.g. national research institutes, NGO and NGO-like organizations for application and reflection on applications in the field which can inform the further research endeavors. At the moment this type of relations are mostly ad-hoc, and project-based. The maintenance of these relationships has high transaction costs: for each occasion proposals have to be developed, partnerships

arranged. The feed back of experiences with the application of findings in the field are at least suboptimal. Particularly relationships within WUR (Larenstein van Hall) seem logical and underexploited.

Summary and statements

Scientific research with a direct impact for/on the ‘target group’ is almost by definition interdisciplinary and action-oriented work. This is the most difficult type of scientific research and therefore hard for junior researchers ‘in training’; it is impossible if institutional context (e.g. type of scholarship, curriculum, assessment of the PhD work) does not provide the means to cope with the additional insecurities and risks.

- 1) With the current PhD set up, the ambition of a PhD student to have direct impact with his/her work remains a future goal – to strive for outside academic environment.
- 2) In the current academic set-up we need more attention for the translation and communication, and suitable partnerships for the use of PhD research findings in practice.

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Annex 8. ICRA’s experience in enhancing the use of PhD research for development

Jon Daane, International Centre for development oriented Research in Agriculture (ICRA), the Netherlands/France)

ICRA and interdisciplinary PhD research for development

ICRA has a long experience of capacity strengthening in interdisciplinary research for development, but does not organise PhD research programmes. Its historic strength is in on-the-job learning programmes for multi-stakeholder partnerships and teams of mid-career professionals involved in agricultural innovation. These strengthen capacities at individual, organisational and partnership level for mutual learning between stakeholder organisations to jointly generate and apply more relevant knowledge for development. Recently, ICRA has also encouraged the participation of higher education institutes (HEIs) in multi-stakeholder innovation partnerships to help mainstream these capacities. This is aimed at changes in BSc and MSc education to better equip future graduates for their work in rural innovation. For this, in addition to sound disciplinary training, HEIs need to develop the meta-disciplinary capacities, social skills and mindsets required for inter and transdisciplinary research for development (T profile). In addition to changes at BSc and MSc level, HEIs are being involved in the kind of in-service learning programmes (“ARD learning cycles”) that are ICRA’s traditional hallmark. In these cycles, HEI bring in their knowledge, including any results of interdisciplinary PhD research, to help solve specific problems in innovation processes. Finally, in S. Africa and Benin, ICRA and partners have attempted to use such ARD learning cycles to design interdisciplinary MSc and/or PhD research programmes. ICRA is currently involved in national ARD learning partnerships in 10 Sub-Saharan African countries and a regional partnership in L. America.

ICRA’s conceptualisation of the research for development process

In order to appreciate ICRA’s contribution to enhancing the use of interdisciplinary PhD research for development (R4D), its views of the R4D process need to be clarified. In ICRA’s view, putting the results of interdisciplinary PhD research to effective use for development requires adequate organisation not only of the “downstream” process – i.e. of what happens after these results have been produced –, but also of the “upstream” process – i.e. of deciding what research results to produce, how and with whom. Moreover, ICRA considers that the artificial conceptual separation of the production and the use of research results in time and space – where research first produces results (knowledge and the technologies, policies, organisational practices in which this knowledge is embodied) that are subsequently put into practice by “end-users” – risks reducing the usefulness of these results. In ICRA’s view, the chances that results are used are much better if these emerge from joint learning between researchers in different disciplines, and between them and different end-users (e.g. suppliers, producers, processors, retailers, policy makers, etc.) and other actors whose full participation is essential to put these results into practice (e.g. technical, financial, legal and other service providers). Production and use of knowledge then ideally go hand in hand during the upstream process leading to PhD theses. This continues in the downstream process, after the theses, when the results are further transformed through learning between the actors involved in their application. The experiences discussed here in the context of “using the results of

interdisciplinary PhD research in practice” reflect this continuity between the upstream and downstream processes.

Learning cycles linking higher education and research to innovation processes

In ICRA partner countries HEIs play an active role in national multi-actor innovation platforms or partnerships together with research and farmers’ organisations, development agencies, policy makers and the private sector. The platforms’ main function is to create conditions for effective collaboration and learning between the member organisations, both at national and local level. This learning is organised around issues of common interest selected by the actors themselves, usually at zonal level – e.g. enhancing the competitiveness of smallholders in a promising value chain, or improving the sustainability of natural resource use in the area. Thus, the entry point is a practical demand rather than an existing body of PhD research for which an application is sought. The process takes the form of an “ARD learning cycle”. Participants are teams of actors directly involved in the common issue, but also actors that need to play a role at different levels in scaling up the ultimate results. The teams participate in a series of workshops spread over time. Between the workshops, while attending to their normal duties, they are also given time and space, as teams, to try out what they learned at the workshops to address the common issue. The workshops serve to draw lessons from this practical experience, learn new concepts, approaches and tools, define improved practices and plan their application. At the end of the learning cycle each participating team has defined a multi-actor action plan to address their common issue. These plans also define what knowledge is needed, what knowledge is available among the actors or can be obtained from outside, what knowledge needs to be developed and how, and what role each member should play in this. Joint implementation of these plans by the teams and their organisations is supported by mentors.

Enhancing the use of research results – experience in the downstream dimension

Where HEI personnel participates in these demand-driven learning cycles, as facilitators and/or as participants, they act as brokers between the HEI knowledge base, partly resulting from PhD research, and the needs of the actors involved in addressing their common issue. This downstream process is not simply a matter of using the results of PhD research in practice, but making use of these results in an interactive learning process with the actors aimed at addressing the common issue. In the process, research results are transformed into useful practices. A major lesson learnt from this is that, while these learning cycles are very effective and highly appreciated, realising the new organisational and partnership institutions needed to implement the joint action plans requires more attention.

Enhancing the use of research results – experience in the upstream dimension

In a few cases such learning cycles have also been used to define interdisciplinary MSc and/or PhD projects, i.e. to embed these research activities into innovation processes right from the start in order to ensure optimal chances for the use of the results. The MSc and/or PhD students, sometimes with their supervisors, participated in these learning cycles and formed teams with the organisations that were directly involved in the common issue. The aim was to collectively define a number of MSc and/or PhD studies in different disciplines (crop, animal and environmental sciences, economics, sociology) that contribute integrated parts of the knowledge needed to address the common issue. This was realised with a group of BSc-level future staff of

various S. African universities who are currently pursuing their MSc studies at WU and will conduct their fieldwork in S. Africa with S. African co-supervision. As a result of their learning cycle, they decided to work on two issues, each studied by a pair of students (one natural and one social scientist). In Benin, a similar attempt was made through a learning cycle involving candidates for DEA and doctoral studies at the local university and for PhD studies at WU. For various reasons this process was only partially successful. Further phases of learning cycles are envisaged to remedy this.

Lessons learnt

Given the modus operandi and culture of HEIs, many difficulties are involved in such attempts to set up interdisciplinary MSc or PhD research projects that directly contribute to innovation processes through interdependent theses in complementary disciplines. These include:

- Fielding a group of PhDs and supervisors around a common issue defined by non-research actors and engaging with these actors from the start is a challenge. It requires better links between HEIs and development actors and more awareness of the function of knowledge for development;
- Jointly defining the knowledge needed to address the common issue and the interdependent roles of complementary disciplines and non-research actors in addressing the issue as defined is a further challenge;
- Accepting these interdependent roles and adapting each disciplinary PhD study to the needs of the issue and to the requirements of complementary PhD studies in other disciplines is not evident. HEIs fear that interdisciplinarity reduces scientific excellence and PhD students thus risk going off on their own (disciplinary) tangents.
- This risk is exacerbated by synchronisation problems and fear that other students will not deliver in the right form and in time;
- Achieving the actual integration of the different PhD studies to ensure that they jointly contribute to addressing the common issue in practice is hindered by disincentives to produce results beyond the individual PhD theses and scientific journal articles;
- Coordinating between research and non-research actors and between complementary disciplines requires new partnership mechanisms and institutions that take time to establish. In the meantime strong and continued leadership is needed to compensate for the absence or weakness of these mechanisms and institutions.

Statements

- Conceptually separating the production and use of results of interdisciplinary PhD research in time and space decreases the chances that results are used and is thus counterproductive.
- Achieving integration of PhD studies in complementary disciplines that jointly contribute to address a common issue defined by non-research actors is hindered by disincentives inherent in the mode of operation and culture of higher education institutes.

Annex 9. Recommendations for policymakers

Jacques Brossier, Institut National de Recherche Agronomique (INRA), France

Who are we as a scientific community?

- We have an epistemological postulate: **all action affecting reality is also a means for understanding reality** (knowledge acquired in action).
- **Intervention/research (or action/research) model**: the intervention with partners seeks also to transform the reality
- **production of knowledge is constitutive of action**, it is co-build in action. Epistemic challenge.?
- So we develop **multi and inter-disciplinarity**

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Seven domains for discussions

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I - Difficulties of action research

Policy-makers have to consider **innovation as a social process**, and interdisciplinary research planning as an aid to learning

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- Convince policy makers of the **importance of the type of systems research and systems objective-oriented research**, initiated by problems that come up in the course of action, so directly aimed towards innovation.
- It needs also more **professionalism** from our community to discuss with policy makers (as some colleagues said)

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II - In our Education and Research institutions

- We have to convince that interdisciplinary research is a **long term and fragile process** (more than academic one),
- so it needs a special support (**protection, institutionalisation??**)

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III – South - North Partnerships

Give support of association South North

- partnerships and association of laboratories,
- twinning of research units, teams or institutions between different countries

Encourage

- joint venture
- Joint publications
- Joint degrees and diplomas

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IV – Developing professional degrees

- To have colleagues from the field with scientific background
- With the support of the policy makers

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V – Involvement of stakeholders

- Encourage research programme with PhD in partnership with **stakeholders, including policy makers.**
- The objectives are to help, by research programme, to transform **direct problems to solve** in more demanding and difficult **problem finding** needing interdisciplinary demarche.

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VI - Evaluation of this kind of research: big issue!

- **Contextual situation:** Difficulty for this type of research to be evaluated (less accepted by the academic community), **so it needs political support**
- **But policy makers can be interested by research connected on societal problems and the implication of the stakeholders?**

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VII - Encourage the employment of PhD students

- A key issue for interdisciplinary PhD programmes
- Disciplines determine career for academic position!!
- The recruitment of PhD persons inside enterprises or whatever institutions is very rare and difficult (in South countries) but positive for the institutions
- But what about NGO, private enterprises, etc ?

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Annex 10. List of participants

| | | |
|-------------------------------|--|--|
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Annex 11. Programme of the workshop

Sharing of experiences between interdisciplinary PhD research programmes related to agricultural and rural development

11 – 12 December 2008

Hof van Wageningen

Programme

Thursday 11 December

Chairman: Jon Daane
Reporter: Pieter Windmeijer

08h30 Arrival, registration and coffee
09h00 Welcome, introduction of the participants, introduction to the workshop
(Pieter Windmeijer, INREF programme manager, Wageningen International)
09h15 Introduction to the ERA-ARD project (Sander van Opstal, representative of the Dutch Ministry of LNV in ERA-ARD project)

Session 1

09h30-12h00 “Enhancing the synergy between different scientific disciplines”
Introductions: Paul Vlek and Alistair Sutherland
Discussant: Paul Kibwika

Discussions

12h00-13h00 Lunch

Session 2

13h00-15h30 “Embedding of societal problems in interdisciplinary PhD research programmes”
Introductions: Anke Niehof and Arnold van Huis
Discussant: Emmanuel Owuso-Bennoah

Discussions

15h30-16h00 Tea/Coffee

Session 3

16h00-18h30: “Models and approaches to organise interdisciplinary PhD research programmes and North-South partnerships”

Introductions: Gertjan Becx and Stephan Rist

Discussant: Shaaban Mgana

Discussions

18h30 Drinks and dinner (Terraszaal, Hof van Wageningen)

Friday 12 December

Chairman: Bram Huijsman

Reporter: Pieter Windmeijer

Session 4

08h30-11h00: “Using the results of interdisciplinary PhD research in practice”

Introductions: Conny Almekinders and Jon Daane

Discussant: Paul Kibwika

Discussions

11h00-11h30 Coffee/Tea

Session 5

11h30-13h00: Formulation of recommendations for policy makers.

Introduction: Jacques Brossier

Discussions

13h00: Lunch and departure participants.