



## **Developing Future Experts in Agriculture for Development: Some thoughts on the challenges of capacity- development to address inter-disciplinary problems**

Shawn J. McGuire

Senior Lecturer in Natural Resources and Development,  
School of International Development,  
University of East Anglia, Norwich, UK. NR4 7TJ

For the industrialised world, food and agriculture have come back into the news. Food price rises play a big role here, reminding the rich world that it cannot take food security for granted. For many less-wealthy parts of the globe, of course, the issue of food security has never really gone away. However, it is clear that food and agriculture are enjoying renewed interest from Northern and Southern policy-makers, and have risen up the agenda for development donors, research, and development practitioners. Every country will need to be able to draw upon skilled expertise in agriculture and development, in order to have any hope of meeting the challenges of future food security. Training future experts, and building national capacity in agriculture for development is obviously important, and is a key issue for this journal. But another issue for this journal is that it is by no means straightforward *how* you build capacity in agriculture for development. For example, what expertise is most relevant for developing agriculture in the 21<sup>st</sup> Century? Do current challenges require fundamentally new skills, or involve new disciplines? Are universities able to provide these skills and remain capable of equipping graduates to work in this field? How far is training oriented towards highly *inter-disciplinary* problems (and working teams)? And can the most talented students be attracted to agriculture and international cooperation?

I have no doubt that these pages will host thoughtful and important debates around capacity development for agricultural development. This brief Preface opens this discussion by reflecting on the questions posed above. The focus on university training, inter-disciplinary skills, and relevance highlights some of most important - and difficult - challenges facing capacity development, challenges which go beyond the organisation of technical training, to embrace current development issues in all their complexity. I do not claim to offer a comprehensive review of training or pedagogy. Rather, I draw from my own experience working in Higher Education in the UK, the Netherlands, and Canada, and agricultural development research work in the South. I trained first in biology, and moved into agriculture and development for my graduate study, and research how agricultural institutions (research, seed supply, and so on) understand and engage with farmers' practices. This has led to work in participatory plant breeding, local plant genetic resource



## **Developing Future Experts in Agriculture for Development: Some thoughts on the challenges of capacity- development to address inter-disciplinary problems**

Shawn J. McGuire

Senior Lecturer in Natural Resources and Development,  
School of International Development,  
University of East Anglia, Norwich, UK. NR4 7TJ

For the industrialised world, food and agriculture have come back into the news. Food price rises play a big role here, reminding the rich world that it cannot take food security for granted. For many less-wealthy parts of the globe, of course, the issue of food security has never really gone away. However, it is clear that food and agriculture are enjoying renewed interest from Northern and Southern policy-makers, and have risen up the agenda for development donors, research, and development practitioners. Every country will need to be able to draw upon skilled expertise in agriculture and development, in order to have any hope of meeting the challenges of future food security. Training future experts, and building national capacity in agriculture for development is obviously important, and is a key issue for this journal. But another issue for this journal is that it is by no means straightforward *how* you build capacity in agriculture for development. For example, what expertise is most relevant for developing agriculture in the 21<sup>st</sup> Century? Do current challenges require fundamentally new skills, or involve new disciplines? Are universities able to provide these skills and remain capable of equipping graduates to work in this field? How far is training oriented towards highly *inter-disciplinary* problems (and working teams)? And can the most talented students be attracted to agriculture and international cooperation?

I have no doubt that these pages will host thoughtful and important debates around capacity development for agricultural development. This brief Preface opens this discussion by reflecting on the questions posed above. The focus on university training, inter-disciplinary skills, and relevance highlights some of most important - and difficult - challenges facing capacity development, challenges which go beyond the organisation of technical training, to embrace current development issues in all their complexity. I do not claim to offer a comprehensive review of training or pedagogy. Rather, I draw from my own experience working in Higher Education in the UK, the Netherlands, and Canada, and agricultural development research work in the South. I trained first in biology, and moved into agriculture and development for my graduate study, and research how agricultural institutions (research, seed supply, and so on) understand and engage with farmers' practices. This has led to work in participatory plant breeding, local plant genetic resource

management, and emergency seed aid, as well as to work on developing national capacity in agricultural biotechnology, and on paying farmers directly for conserving ecosystem services. I routinely draw from different disciplines – ecology and genetics, along with anthropology, the sociology of science, and political ecology. More pertinently for this Preface, I work in the School of International Development at the University of East Anglia, a department dedicated to inter-disciplinary approaches to research and teaching. While individual faculty specialise in different areas, such as economics, anthropology, or natural science, our work and teaching is often in teams, crossing disciplines. Our annual student intake is about 250 students, coming from over 50 countries, to enter into one of 18 different development courses (BA, BSc, Masters) or PhD research. I am current the Director of Teaching, so am intimately aware of the difficulties of delivering this array of courses, and of attracting students in a competitive sector. Finally, I co-Direct a new course, a MA in Agriculture and Rural Development, which started in 2011, and so recently have confronted issues of training in agriculture and development very directly.

## **Agriculture for Development: An inter-disciplinary field**

There is no shortage of challenges facing agriculture and food security. Normally, one begins a discussion of these issues by reciting a list of these challenges, such as: land and water scarcity, the slowing down of productivity increases, population growth, consumption changes, biofuels, and climate change. This litany is generally followed by some sort of ‘road-map’, outlining a vision of future global food security, and how agricultural research and development can help deliver this vision. Recent reviews by IAASTD (2008), the UK government, and Royal Society follow this template (Foresight, 2011; Royal Society, 2009). I broadly support the call of these reports for increased funding to build capacity in agricultural science: there will always be a need for to have people with strong scientific skills in various agricultural fields, whether generalist or specialist. However, if training priorities in a given country are completely defined by an outline of problems at the global level, and largely framed as technical exercises, then capacity development efforts will be limited to production issues, and risk being ineffective.

While some credit the success of the Green Revolution to its technical components and top-down approach, this success came two generations ago now, and many parts of the narrative of success are contested. It is now clearer than ever that food security and development issues cross scales and disciplines. A few examples illustrate this. Firstly, the links between agriculture and poverty-reduction are obviously important (both are key Millennium Development Goals, after all), but these links are extremely context-dependent. Farming systems and production potential clearly matter, but so do trade policies, national labour markets, farming’s position within diversified livelihoods, gender relationships, and (not least) the impact of the technology in question on issues such as factor productivity or risk. Such complex contextual factors affect *which* types of production gains will address poverty, *how* this happens, and for *whom* (Hazell and Haddad, 2001). Secondly, agricultural research is but one part of a system of innovation (Hall, 2005): both formal and informal institutions linked to farmers and to other parts of a value chain shape innovation, adoption, and impacts. Links within an innovation system are often poorly-developed. Thirdly, ‘post-productivist’ agendas increasingly impinge upon agriculture, seen, for example, in growing concerns around food quality and food safety, and in desires for sustainability, environmental conservation, or ethical quality. In particular, food and farming practices often feature in political struggles to preserve cultural identity or autonomy. Debates around food sovereignty raise important questions around justice, rights, and the direction of agricultural

development. However, technical research rarely engages with such questions in any depth. Finally, national and especially international governance increasingly links food and agriculture to other policy areas such as biodiversity conservation, intellectual property rights, or humanitarian interventions (Sperling and McGuire, 2010).

These examples show how agriculture is fundamentally inter-disciplinary. My point here is that considering agriculture from a perspective of development (what I will call ‘agriculture for development’) involves more than techno-science. This agenda needs to engage with different types of institutions, with markets and value chains, with national and international policies, with the cultural and political dimensions of food and food production, and with wider debates around what ‘development’ actually means.

### ■ **New Professionalism?**

What are the implications of such an inter-disciplinary agenda for capacity-development? It is not to dilute specialist training so that everyone is a generalist, but rather to equip professionals to be able to engage with issues beyond their own specialism, and to appreciate the wider context of their work. Professionals can benefit from greater familiarity with areas outside their own specialism, particularly if that comes through collaboration on inter-disciplinary teams. In my view, any modern professional in agriculture for development can benefit greatly from being able to link one’s own in-depth knowledge to other disciplines, and being able to cross scales for understanding (e.g. the influence of national and international policies on local farming practices). In fact, I would argue that these skills are essential.

Such skills are best developed through practice. However, research institutions often make it difficult for such inter-disciplinary team work to occur. Cultures of research excellence focus on publication, particularly in specialised journals, and offer few incentives for engaging with more complex inter-disciplinary problems in agriculture or poverty. Research teams tend to remain within disciplinary silos, and research agendas remain supply-driven. As a result, those who wish to take a more problem- or stakeholder-focused approach and work through networks can find their careers side-tracked (Chataway *et al.*, 2007). This challenge is widespread in the North as well as the South, and will only change slowly. In this light, it could be very fruitful to reflect on attempts to embed Farming Systems Research (FSR) into Southern research systems the 1980s-90s. While this inter-disciplinary problem-centred approach was popular in some places, the pull of traditional disciplines, and the changing tide of development fashion, meant that most FSR units dissolved long ago. The more recent push to mainstream farmer participatory research may offer similar opportunities for reflecting on institutions. Capacity-development needs to understand how research systems exert their own forces, which can shape, or limit, change.

### ■ **Education in Agriculture for Development: Low supply or weak demand?**

The final sections of this preface turn towards education, particularly to the role of universities in training future agricultural development practitioners. In the UK where I work, university enrolment has been growing steadily, particularly for taught Masters courses which have seen numbers surge in the last decade. Considering job markets and the economic situation, this is not surprising. It is also not surprising that there are dozens of Masters courses linked to international development in many different UK universities, as

the subject is topical, the UK is a significant contributor to international development, and there is a long academic tradition of development teaching and research. What is more surprising is how few UK courses link agriculture and development. While over 30 UK Masters courses have sustainable agriculture or sustainable development in their titles, only two address agriculture in the developing world, largely taking a technical focus. While my department's new MA in Agriculture and Rural Development will be more interdisciplinary, it is important to note that agriculture had a low profile in my department until recently. For instance, we used to have an MSc in Agriculture, Environment, and Development, but dropped the word 'Agriculture' from the title and the content around 1998 due to low student interest.

These stories reflect wider trends. Donors in the UK, and other rich countries, moved away from emphasising agriculture in the past 15 to 20 years. Instead, other issues grew in status, such as governance, empowerment, chronic poverty, HIV/AIDS, or climate change. In DFID, the UK's Department for International Development, the number of officials with agricultural expertise shrank dramatically during this period. This led to declining influence within the aid bureaucracy, and fewer obvious career paths for agricultural experts in development. In many countries, student interest in agriculture also declined from the 1990s (Mulder and Kupper, 2006). In the UK, agricultural subjects tend not to attract the best performing students (Leslie, 2003), which is perhaps not surprising as farming is seen as a declining industry in Europe. Also, as with donors, students have been drawn to other courses in related topics such as sustainability, conservation, or resource management.

Fortunately, the situation is changing now. As mentioned above, the profile of agriculture has risen considerably in policy arenas, and agriculture is back at the heart of most development agendas. There are more opportunities than ever before to cross disciplinary boundaries in research or in development programmes on the ground. Student interest in agriculture is higher now than I have seen for 15 years. If the UK situation is typical of other countries, this suggests that now is a highly opportune time to reinvigorate university training in agriculture for development, and attract new students to this exciting and dynamic field.

## **Attracting New Students to Agriculture for Development: Opportunities and Challenges**

There is no single 'best' approach to capacity-development. But in the interests of stimulating on-going debate, I conclude with some personal thoughts on the opportunities and challenges of doing this.

One opportunity for attracting students is to highlight how agriculture links to many other issues. For instance, crop evapo-transpiration rates are not just of interest to irrigation planners and agronomists, but overlap with issues such as trans-boundary river management, international trade of 'virtual water' (the water footprint of production), or negotiation among different stakeholders in a watershed for the use of scarce resources. Showing such links can help bring the complexity of issues to the fore, and spur some students to pursue technical issues in more depth. A second opportunity is to bring in politics, in order to show that there are interest groups and contested issues behind most topics, particularly when there are choices to be made. This does not mean converting agronomists into sociologists. However, even the most technical specialist can gain from a better understanding of the food and agriculture debates that affect their field, and of the different positions and interest groups involved. A third opportunity is to focus on practices of key actors – farmers,

consumers, enterprises – so that students are able to move from abstract theories towards understanding the actual decisions people take. This may link to analytical approaches such as farming systems research, the rural livelihoods framework, or value chains, and to methods such as ethnography or participant-observation. A final opportunity for attracting students is to ensure that courses can enhance their skills, both academic and employment-related. This is particularly important for inter-disciplinary students, where team-work and the analysis of complex problems are commonplace.

Many challenges remain, however, for developing capacity at the interface of agriculture and development. Some of these challenges are around inter-disciplinary work more generally. For instance, how should natural and social science topics be combined? Should one discipline take precedence? How are learning outcomes, and academic excellence, defined? There are many different possible approaches for inter-disciplinary teaching and research, and promoting one single ‘accepted’ approach should be avoided, lest it establish a rigid orthodoxy. Other challenges relate to teaching agriculture for development. Course leaders need to be aware of how career paths are changing in development, so that teaching can relate to what current students will be doing when they graduate, and current employers can be approached for work placements. Of course, it always remains a difficult task to keep course content current, develop skills, and generally engage with students’ interests and aspirations.

Developing capacity in agriculture and development is an enormous task. This preface merely hints at the importance of capacity-development, and at some key debates. This journal will give these debates – and many others as well – the deeper attention which they so richly deserve.

Chataway J, Smith J, Wield D. (2007) Shaping scientific excellence in agricultural research. *International Journal of Biotechnology* 9: 172-187.

Foresight. (2011) *The Future of Food and Farming*. Final Project Report. 211 London: UK Government Office for Science.

Hall A. (2005) Capacity development for agricultural biotechnology in developing countries: an innovation systems view of what it is and how to develop it. *Journal of International Development* 17: 611-630.

Hazell PBR, Haddad L. (2001) *Agricultural Research and Poverty Reduction*. 40 Washington, DC: IFPRI.

IAASTD (2008). *Agriculture at a Crossroads: Global Report International Assessment of Agricultural Science and Technology for Development*.

Leslie D. (2003) Using success to measure quality in British Higher Education: which subjects attract the best-qualified students? *Journal of the Royal Statistical Society: Series A* 166: 329-347.

Mulder M, Kupper H. (2006) The Future of agricultural education: the case of the Netherlands. *Journal of Agricultural Education and Extension* 12: 127-139.

Royal Society. (2009) *Reaping the Benefits: Science and the Sustainable Intensification of Global Agriculture*. 72 London: The Royal Society.

Sperling L, McGuire SJ. (2010) Persistent myths about emergency seed aid. *Food Policy* 35: 195-201.

management, and emergency seed aid, as well as to work on developing national capacity in agricultural biotechnology, and on paying farmers directly for conserving ecosystem services. I routinely draw from different disciplines – ecology and genetics, along with anthropology, the sociology of science, and political ecology. More pertinently for this Preface, I work in the School of International Development at the University of East Anglia, a department dedicated to inter-disciplinary approaches to research and teaching. While individual faculty specialise in different areas, such as economics, anthropology, or natural science, our work and teaching is often in teams, crossing disciplines. Our annual student intake is about 250 students, coming from over 50 countries, to enter into one of 18 different development courses (BA, BSc, Masters) or PhD research. I am current the Director of Teaching, so am intimately aware of the difficulties of delivering this array of courses, and of attracting students in a competitive sector. Finally, I co-Direct a new course, a MA in Agriculture and Rural Development, which started in 2011, and so recently have confronted issues of training in agriculture and development very directly.

## **Agriculture for Development: An inter-disciplinary field**

There is no shortage of challenges facing agriculture and food security. Normally, one begins a discussion of these issues by reciting a list of these challenges, such as: land and water scarcity, the slowing down of productivity increases, population growth, consumption changes, biofuels, and climate change. This litany is generally followed by some sort of ‘road-map’, outlining a vision of future global food security, and how agricultural research and development can help deliver this vision. Recent reviews by IAASTD (2008), the UK government, and Royal Society follow this template (Foresight, 2011; Royal Society, 2009). I broadly support the call of these reports for increased funding to build capacity in agricultural science: there will always be a need for to have people with strong scientific skills in various agricultural fields, whether generalist or specialist. However, if training priorities in a given country are completely defined by an outline of problems at the global level, and largely framed as technical exercises, then capacity development efforts will be limited to production issues, and risk being ineffective.

While some credit the success of the Green Revolution to its technical components and top-down approach, this success came two generations ago now, and many parts of the narrative of success are contested. It is now clearer than ever that food security and development issues cross scales and disciplines. A few examples illustrate this. Firstly, the links between agriculture and poverty-reduction are obviously important (both are key Millennium Development Goals, after all), but these links are extremely context-dependent. Farming systems and production potential clearly matter, but so do trade policies, national labour markets, farming’s position within diversified livelihoods, gender relationships, and (not least) the impact of the technology in question on issues such as factor productivity or risk. Such complex contextual factors affect *which* types of production gains will address poverty, *how* this happens, and for *whom* (Hazell and Haddad, 2001). Secondly, agricultural research is but one part of a system of innovation (Hall, 2005): both formal and informal institutions linked to farmers and to other parts of a value chain shape innovation, adoption, and impacts. Links within an innovation system are often poorly-developed. Thirdly, ‘post-productivist’ agendas increasingly impinge upon agriculture, seen, for example, in growing concerns around food quality and food safety, and in desires for sustainability, environmental conservation, or ethical quality. In particular, food and farming practices often feature in political struggles to preserve cultural identity or autonomy. Debates around food sovereignty raise important questions around justice, rights, and the direction of agricultural

development. However, technical research rarely engages with such questions in any depth. Finally, national and especially international governance increasingly links food and agriculture to other policy areas such as biodiversity conservation, intellectual property rights, or humanitarian interventions (Sperling and McGuire, 2010).

These examples show how agriculture is fundamentally inter-disciplinary. My point here is that considering agriculture from a perspective of development (what I will call ‘agriculture for development’) involves more than techno-science. This agenda needs to engage with different types of institutions, with markets and value chains, with national and international policies, with the cultural and political dimensions of food and food production, and with wider debates around what ‘development’ actually means.

### ■ **New Professionalism?**

What are the implications of such an inter-disciplinary agenda for capacity-development? It is not to dilute specialist training so that everyone is a generalist, but rather to equip professionals to be able to engage with issues beyond their own specialism, and to appreciate the wider context of their work. Professionals can benefit from greater familiarity with areas outside their own specialism, particularly if that comes through collaboration on inter-disciplinary teams. In my view, any modern professional in agriculture for development can benefit greatly from being able to link one’s own in-depth knowledge to other disciplines, and being able to cross scales for understanding (e.g. the influence of national and international policies on local farming practices). In fact, I would argue that these skills are essential.

Such skills are best developed through practice. However, research institutions often make it difficult for such inter-disciplinary team work to occur. Cultures of research excellence focus on publication, particularly in specialised journals, and offer few incentives for engaging with more complex inter-disciplinary problems in agriculture or poverty. Research teams tend to remain within disciplinary silos, and research agendas remain supply-driven. As a result, those who wish to take a more problem- or stakeholder-focused approach and work through networks can find their careers side-tracked (Chataway *et al.*, 2007). This challenge is widespread in the North as well as the South, and will only change slowly. In this light, it could be very fruitful to reflect on attempts to embed Farming Systems Research (FSR) into Southern research systems the 1980s-90s. While this inter-disciplinary problem-centred approach was popular in some places, the pull of traditional disciplines, and the changing tide of development fashion, meant that most FSR units dissolved long ago. The more recent push to mainstream farmer participatory research may offer similar opportunities for reflecting on institutions. Capacity-development needs to understand how research systems exert their own forces, which can shape, or limit, change.

### ■ **Education in Agriculture for Development: Low supply or weak demand?**

The final sections of this preface turn towards education, particularly to the role of universities in training future agricultural development practitioners. In the UK where I work, university enrolment has been growing steadily, particularly for taught Masters courses which have seen numbers surge in the last decade. Considering job markets and the economic situation, this is not surprising. It is also not surprising that there are dozens of Masters courses linked to international development in many different UK universities, as



the subject is topical, the UK is a significant contributor to international development, and there is a long academic tradition of development teaching and research. What is more surprising is how few UK courses link agriculture and development. While over 30 UK Masters courses have sustainable agriculture or sustainable development in their titles, only two address agriculture in the developing world, largely taking a technical focus. While my department's new MA in Agriculture and Rural Development will be more interdisciplinary, it is important to note that agriculture had a low profile in my department until recently. For instance, we used to have an MSc in Agriculture, Environment, and Development, but dropped the word 'Agriculture' from the title and the content around 1998 due to low student interest.

These stories reflect wider trends. Donors in the UK, and other rich countries, moved away from emphasising agriculture in the past 15 to 20 years. Instead, other issues grew in status, such as governance, empowerment, chronic poverty, HIV/AIDS, or climate change. In DFID, the UK's Department for International Development, the number of officials with agricultural expertise shrank dramatically during this period. This led to declining influence within the aid bureaucracy, and fewer obvious career paths for agricultural experts in development. In many countries, student interest in agriculture also declined from the 1990s (Mulder and Kupper, 2006). In the UK, agricultural subjects tend not to attract the best performing students (Leslie, 2003), which is perhaps not surprising as farming is seen as a declining industry in Europe. Also, as with donors, students have been drawn to other courses in related topics such as sustainability, conservation, or resource management.

Fortunately, the situation is changing now. As mentioned above, the profile of agriculture has risen considerably in policy arenas, and agriculture is back at the heart of most development agendas. There are more opportunities than ever before to cross disciplinary boundaries in research or in development programmes on the ground. Student interest in agriculture is higher now than I have seen for 15 years. If the UK situation is typical of other countries, this suggests that now is a highly opportune time to reinvigorate university training in agriculture for development, and attract new students to this exciting and dynamic field.

## **Attracting New Students to Agriculture for Development: Opportunities and Challenges**

There is no single 'best' approach to capacity-development. But in the interests of stimulating on-going debate, I conclude with some personal thoughts on the opportunities and challenges of doing this.

One opportunity for attracting students is to highlight how agriculture links to many other issues. For instance, crop evapo-transpiration rates are not just of interest to irrigation planners and agronomists, but overlap with issues such as trans-boundary river management, international trade of 'virtual water' (the water footprint of production), or negotiation among different stakeholders in a watershed for the use of scarce resources. Showing such links can help bring the complexity of issues to the fore, and spur some students to pursue technical issues in more depth. A second opportunity is to bring in politics, in order to show that there are interest groups and contested issues behind most topics, particularly when there are choices to be made. This does not mean converting agronomists into sociologists. However, even the most technical specialist can gain from a better understanding of the food and agriculture debates that affect their field, and of the different positions and interest groups involved. A third opportunity is to focus on practices of key actors – farmers,

consumers, enterprises – so that students are able to move from abstract theories towards understanding the actual decisions people take. This may link to analytical approaches such as farming systems research, the rural livelihoods framework, or value chains, and to methods such as ethnography or participant-observation. A final opportunity for attracting students is to ensure that courses can enhance their skills, both academic and employment-related. This is particularly important for inter-disciplinary students, where team-work and the analysis of complex problems are commonplace.

Many challenges remain, however, for developing capacity at the interface of agriculture and development. Some of these challenges are around inter-disciplinary work more generally. For instance, how should natural and social science topics be combined? Should one discipline take precedence? How are learning outcomes, and academic excellence, defined? There are many different possible approaches for inter-disciplinary teaching and research, and promoting one single ‘accepted’ approach should be avoided, lest it establish a rigid orthodoxy. Other challenges relate to teaching agriculture for development. Course leaders need to be aware of how career paths are changing in development, so that teaching can relate to what current students will be doing when they graduate, and current employers can be approached for work placements. Of course, it always remains a difficult task to keep course content current, develop skills, and generally engage with students’ interests and aspirations.

Developing capacity in agriculture and development is an enormous task. This preface merely hints at the importance of capacity-development, and at some key debates. This journal will give these debates – and many others as well – the deeper attention which they so richly deserve.

Chataway J, Smith J, Wield D. (2007) Shaping scientific excellence in agricultural research. *International Journal of Biotechnology* 9: 172-187.

Foresight. (2011) *The Future of Food and Farming*. Final Project Report. 211 London: UK Government Office for Science.

Hall A. (2005) Capacity development for agricultural biotechnology in developing countries: an innovation systems view of what it is and how to develop it. *Journal of International Development* 17: 611-630.

Hazell PBR, Haddad L. (2001) *Agricultural Research and Poverty Reduction*. 40 Washington, DC: IFPRI.

IAASTD (2008). *Agriculture at a Crossroads: Global Report International Assessment of Agricultural Science and Technology for Development*.

Leslie D. (2003) Using success to measure quality in British Higher Education: which subjects attract the best-qualified students? *Journal of the Royal Statistical Society: Series A* 166: 329-347.

Mulder M, Kupper H. (2006) The Future of agricultural education: the case of the Netherlands. *Journal of Agricultural Education and Extension* 12: 127-139.

Royal Society. (2009) *Reaping the Benefits: Science and the Sustainable Intensification of Global Agriculture*. 72 London: The Royal Society.

Sperling L, McGuire SJ. (2010) Persistent myths about emergency seed aid. *Food Policy* 35: 195-201.