

New pathways to build capacity for development oriented agricultural research and innovation

Author: Jon Daane¹

The context for agricultural research for development (R4D) or development oriented agricultural research is changing rapidly, both in the South and at the international level. Multilateral and bilateral donor policies rediscover the role of agriculture in development and are linking funding for agricultural R4D to its contributions to achieving Millennium Development Goals, such as poverty reduction and sustainable natural resource use. This supports similar new policy initiatives at continental, regional and national levels in the South. These initiatives to revitalise or modernise agriculture emphasise the importance of the capacity to access, generate and use new knowledge to promote market access for poor smallholder farmers, value adding, and chain development in increasingly globalising competitive markets and to address critical issues in the management of natural resources. This calls for equally revitalised research and development institutes (R&DIs) and higher education institutes (HEI). New research capacities need to be developed to allow these institutes to jointly play a dynamic and catalysing role in national agricultural innovation systems. Mechanisms need to be found to link these institutes to the international agricultural research networks that are formed to tackle issues of global concern, so that R4D can benefit from experiences at the global level.

The paper provides an overview of past experiences in building agricultural R4D capacity in the South and lessons learnt from this. It discusses the fundamental and far-reaching changes that are needed to enhance new research capacity for effective innovation systems against the background of important developments in international and research cooperation. The paper ends with a discussion of the scope for international cooperation in research capacity building and possible contributions from the Netherlands in the national and European context.

Within the scope of this paper, it would be too ambitious to deal with the entire South and do justice to the full diversity of situations. As Dutch and European development cooperation is focussed on the poorer countries and as most of these are in Sub-Saharan Africa (SSA), the paper is written from the perspective of the changing contexts of Dutch/European-SSA development cooperation and of global cooperation in science.

Past experiences in building agricultural research institutes and systems

At independence there were few R&DIs in SSA, often implementing regional commodity (mainly cash and/or plantation crop) programmes directed from R&D centres in the former colonial powers. Originally, their staff came mainly from these former powers. Later, these R&DIs were separated from the parent bodies, their staff was Africanised and they developed national (rather than regional) programmes, increasingly including programmes for smallholder agriculture on food crops and local livestock, but keeping a strong commodity focus. National funding for these R&DIs has overall been far from adequate. To date they remain limited in size, currently ranging from not more than one or two dozen scientists in the smaller countries to a few hundred in the larger ones, not counting Nigeria. Initially these include mainly BSc, some MSc and a few PhD degree holders. Most depended on research collaboration with Northern R&DIs or HEIs and CGIAR centres, including staff development and investments in research infrastructure, for which considerable donor funding was available until about the mid-1980s. In view of the scarcity of

research capacity, national agricultural R&DIs formed networks, such as the Special Programme for African Agricultural Research (SPAAR) at the continental level and Sub-Regional Organisations (SROs), each with a small executive secretariat, to benefit from economies of scale, promote research collaboration and address problems of regional scope. Their importance increased since the mid-1990s and especially since the creation of the Forum for Agricultural Research in Africa (FARA) in 2001 to replace SPAAR.

In the 1960s/70s these R&DIs were expected to play a specialised role focussed on production of technologies (crop varieties and production techniques, livestock breeds and husbandry measures, etc.) that were to be transferred to end-users by intermediaries, such as public extension agencies and later on also NGOs. In the 1980s, it was realised that this linear ‘transfer of technology’ mode was more appropriate for simple mono-cropping production systems than for the complex production systems of small scale farmers predominant in SSA. Experimentation with alternative approaches, such as Farming Systems Research, provided opportunities for direct interaction between researchers of different disciplines, farmers and extensionists aimed at development of technologies that were better adapted to the complexity and diversity of smallholder farming systems. This led to enhanced use of socio-economic expertise and capacity building in multi- and interdisciplinary research approaches, but maintained a strong focus on technology development. Despite these efforts, problems of scaling up and scaling out remained due to the limited range of actors involved, and FSR was seldom fully mainstreamed.

In a parallel and related development, in this same period, the notions of Agricultural Knowledge (and Information) System (AKS/AKIS) and National Agricultural Research System (NARS) were introduced reflecting increased insight into the complexity of R4D processes and the need to coordinate between interrelated institutional roles. At the same time, however, both national and international funding for agricultural development, research and education in SSA decreased. As a result, many SSA countries are currently still struggling to establish an operational NARS with far too limited resources, at a time when the insight is gaining ground that NARS need to evolve into Agricultural Innovation Systems (AIS) to remain relevant in the face of the growing complexity of the issues they need to address.

These various developments put increasing demands on the organisations concerned. While in the past it was enough for research organisations to produce new crop varieties and animal breeds, they are now supposed to make a contribution to poverty reduction, sustainable natural resource use and competitiveness of small scale agriculture. Meeting these demands calls for staff capacities that range wider than those of a simple laboratory or field researcher and that demand far reaching changes in higher education to train new generations of researchers, which are discussed later in this paper.

Past experiences in building higher education and research capacity

At independence there were only 20 HEIs in SSA and even fewer played a role in agricultural research capacity development (e.g. Ibadan, Makerere). Initially these HEI depended largely on expatriate staff and national agricultural research capacity was strengthened through MSc and PhD training at Northern HEIs, at first through research in the North on agendas set by the Northern HEIs, later through research in the South (sandwich and ‘picnic’ models), very often working on Northern/IARC initiated collaborative research with Southern institutes using bilateral and multilateral (e.g. INCO-DEV) funding. Joint North-South supervision of ‘sandwich students’ contributed to individual staff development, but as the joint research programmes were often conceived in the North, they left the Southern HEIs with a patchwork of MSc and PhD

research activities that did not strengthen their capacity to develop and implement institute-based research policies and programmes.

Through the 1970s/'80s, SSA countries gradually built up their own HEIs. Institutional strengthening programmes of Northern donor countries have supported this (in the Netherlands: PUO/DSO, MHO, NPT). Currently more and more countries have the capability to offer BSc and MSc degrees and recently some have begun graduate/doctoral schools. Regional networks, such as ANAFE and RUFORUM, or centres, such as the CRESA, have been set up to enhance quality and promote sharing of scarce facilities and expertise, but these are generally under-funded. Northern HEIs and R&D organisations remain attractive for sandwich MSc and PhD research.

Despite this tremendous achievement in building HEI capacity, considerable problems remain or have even grown over recent decades. One problem is that material conditions have deteriorated. Student numbers have increased beyond capacity, public funding is diminishing and HEIs are seriously under-resourced, both in staff (leading to poor teacher/student ratios), infrastructure and operating budgets. Due to heavy teaching and administrative workloads, teachers hardly have time for research; they are poorly paid and compensate this with side activities that do not necessarily enhance academic quality. There is a considerable brain drain to other employment both nationally and abroad. Successive Structural Adjustment Programmes (SAPs) have also caused a generation gap. Very few new faculty have been recruited over the last decades, leaving the HEIs without young blood. Now that the first generation of scientists is retiring, there are not enough experienced successors.

A more conceptual issue is that HEIs in SSA and elsewhere in the South are modelled on the example of Northern universities and uncritically adopted the culture and values, organisational structures and procedures, etc. of the North. Little attention has been given to rethinking the role of HEIs in the South – and the role of science more generally – in the context of national development, growth of the ag sector, poverty reduction, sustainable NRM, etc., and more recently in the context of globalisation. Curricula and textbooks have often been taken from the North, and teaching takes little account of the reality outside the HEI-walls. HEIs are thus fairly isolated and inward looking and miss the mechanisms to adapt their curricula to changing labour market requirements. The separation of disciplinary departments within the HEIs is not conducive to develop interdisciplinary teaching and research and even within departments individual lecturers teach their courses independently. Teaching methods and student assessment stay geared towards reproducing transferred information, not towards facilitating learning. As a result of these conditions, students make little connection between what they learn at school and the reality outside. Agricultural studies have lost the attraction they had in early after independence. HEIs realise the need to reverse this trend and to make their curricula more attractive and responsive, but do not know very well how to do this as their structures, regulations and culture and their state of under-funding are hampering change.

Partly due to resource limitations, but also due to the administrative separation of HEIs and R&DIs in many SSA countries, HEIs do very little research and research collaboration between HEIs and R&DIs is limited. Topics for MSc research are often dependent on incidental opportunities and personal contacts of students or supervisors that differ from year to year, and few HEIs have operational institute-wide research programmes around which MSc and PhD research is systematically organised over a longer period. Research undertaken in this incidental and individual manner – including haphazard response to all sorts of demand – does not lead to the systematic accumulation of knowledge and building of teams of scientists that are needed to create a stimulating environment for science and innovation. In the absence of institute-wide shared research priorities and long-term programmes that build on and enhance the institute's

comparative advantage, individual faculty are easily carried away by academic fashions that bring prestige in the global context, without having to rethink their relevance for the HEI's research thrust and the national context.

Overall, the poor material conditions that limit staff availability for academic work, the lack of interaction between departments or even between faculty in the same department, and the piecemeal and individual nature of the MSc and PhD research, make that many HEIs are more resembling collections of individuals than institutes that bind individuals into teams and larger units that work towards a common cause and support and stimulate each other in developing excellence.

Lessons learnt

The need for a much more coherent approach to institutional capacity building

For decades, Northern donor support to institutional capacity building of R&DIs and HEIs in SSA has taken the form of staff deployment from the North, national staff development by training individual MSc and PhD students in the North, investments in infrastructure, provision of curricula and learning materials and joint research programmes with Northern R&DIs and HEIs, often Northern-initiated and managed. Frequently, several bilateral donors and Northern R&DIs and HEIs were collaborating in this way with the same SSA R&DI or HEI. The latter have often not been strong enough to develop their own strategies for institutional and human resource development, education and research programmes in which these various sources of Northern assistance could be integrated to form a coherent whole. Investments in capacity building have therefore often strengthened – and very successfully in some cases (e.g. some of the PUO/MHO projects) – specific individuals, departments or programmes, but this was not seldom achieved at the expense of the integrity of the whole. Being severely under-resourced and dependent on international donor support, many leaders of R&DIs and HEIs in SSA have accepted this situation and the resulting patchwork, which they could sometimes also use to their own advantage, but it has left them with unbalanced institutions, which was particularly problematic when donor and national funding declined from the late 1980 onwards.

It is now realised, both in the North and in SSA, that a more coherent approach is needed to establish a sustainable research capacity. Positive developments are that the Paris Declaration calls for donor harmonisation, while the R&DIs and HEIs in SSA have gained in confidence and independence, also because of changing international donor funding mechanisms, giving them a stronger influence vis-à-vis the Northern partners. These developments potentially provide a basis for a more systemic and holistic approach to building research capacity through international cooperation.

Funding recurrent costs

Another lesson learnt is that making such considerable investments in institutional capacity building as were made in the 1970s and '80s does not by itself produce a sustainable institution with a vibrant academic and research climate, if there is not enough funding for recurrent costs. Experience has shown that, with few exceptions, SSA R&DIs and HEIs have not been able to sufficiently increase revenue from private sources in the face of decreasing public national and international funding over the last two decades. It is not realistic to expect that this will change. Higher education is primarily paid from public funds almost everywhere in the world and R&D is almost by definition addressing a sector that does not have the capacity to pay for inevitably expensive research and education services, nor the private sponsors that would pay for this.

Despite the promises of the Cape Town Declaration to increase public funding for agricultural development, research and education, national budgets will remain insufficient, at least in the poorer countries and in the medium term. Building and sustaining the needed research capacity will therefore require enhanced and continued long-term international donor support, not only for investments in people and infrastructure and joint research with Northern partners, but also for recurrent costs of these institutions. This should guarantee competitive salaries, working conditions and career opportunities that justify a performance-oriented culture and related assessment system. Without this support over 20 years or more, it will not be possible to build the vibrant African R&DIs and HEIs needed to stimulate agricultural innovation in the way such institutes did elsewhere in the world.

Building institutional capacity requires a clear and shared mission

Successful institutional capacity building requires development of a clear and shared vision on the mission and purpose of individual R&DIs and HEIs in SSA and, more generally, on the role of science in development and innovation for poverty reduction and sustainable natural resource use. The current mission statements and related rhetoric on scientific excellence and the importance of science for development are too superficial to provide enough guidance for institutional capacity building. Is the mission of these institutes to pursue science per se and thus to compete and collaborate at the global level, which few countries can afford, even in the North? Or is it to produce new knowledge that is relevant for regional or national development? Or is it to provide leadership in national and local innovation and a capacity to access, adapt, apply and use knowledge from different sources? And if it is any of the latter, to what extent should the mission of these institutes be to promote large-scale mainstream commercial farming or a gradual commercialisation of smallholder family farming?² And how should this national development-oriented research capacity articulate with the global evolution of science? There are obviously no universally valid answers to these questions. No size fits all. And in some cases the issue may be one of relative balance rather than of either/or. But the questions need to be raised and answered in the case of each specific country and R&DI or HEI and general consensus on these answers needs to be built among all concerned. This requires strong and visionary institutional leadership with a capacity for policy dialogue to create political will.

Building capacity for change

More coherent investments, guaranteed recurrent funding and clarity on mission and purpose are necessary, but not sufficient conditions to build sustainable institutional capacity. Fundamental changes will be needed to open up the SSA R&DIs and the HEIs to the reality immediately outside their walls and make them responsive to the changing needs of the agricultural sector in their countries and regions. This can only be achieved by involving policy makers, farmers' and civil society organisations and the agro-industry, not only in redefining the content of curricula and research programmes, but also in implementing these, changing the interaction between teachers and students and between researchers and 'end-users' and the modes of teaching and learning, changing assessment systems for students and staff, breaking down walls between departments, etc. These changes touch upon inherited structures, culture and value systems of the R&DIs and HEIs and need to be carefully negotiated to balance the gains and losses and to avoid a feeling of loss of control among teachers, researchers and academic and management bodies of the institutes, which would cause the change to fail. The scope and temporal scale of the results of this negotiation must be broad enough to give medium-term direction to the institutes and their capacity strengthening strategy. While institutes need to become more flexible and dynamic, they cannot follow every short-term fashion without losing integrity of their purpose. To date, international cooperation has given very little attention to the need to build capacity to manage these change processes and to influence policy making. New competencies need to be mobilised

in North and South, including from outside the R&DIs and HEIs, to achieve this capacity building.

Changing contexts of research and international cooperation

The context of international research cooperation and capacity strengthening is changing rapidly under the impact of globalisation, market liberalisation, decentralisation, privatisation and the development of new technologies. This paper looks at changes in policy at the international and the national level in SAA; changes in the paradigm of R4D; and developments in research at the global and local level, as well as in capacity strengthening for R4D. Central in these changes is the growing awareness of the increasing importance of knowledge. The ability of nations to realise growth and distribute wealth, deal with climate change and resolve energy problems is increasingly dependent on their capacity to innovate and to rapidly access and generate the required knowledge for this.

Important developments at the international policy level are the recent re-discovery of the importance of the agricultural sector for growth and the link made between agriculture and the MDGs, especially poverty reduction and sustainable natural resource use (IAC-report Kofi Annan, WDR2008, etc.). At the continental level, NEPAD’s Comprehensive Africa Agriculture Development Programme (CAADP) and Framework for African Agricultural Productivity (FAAP) manifest strong support for modernising agriculture and rethinking its role in development. At national level, this is reflected in e.g. Kenya’s Strategy for Revitalising Agriculture and Uganda’s Plan for Modernisation of Agriculture. These policies aim at far-reaching changes to develop their NARS into innovation systems that are more market responsive, demand-driven and client-oriented. Value chain development, value addition and market access are seen as important instruments to reduce poverty. These policies also changed the funding of R4D, which is now much more dependent on Competitive Grant Schemes and other demand-driven mechanisms, including some Public-Private Partnerships. This promotes collaboration between R&DIs and e.g. HEIs, farmers’ organisations, ministries, agri-business and private service providers and put a strong emphasis on empowerment to fill the vacuum left by years of SAPs.

FARA, the SROs and the constituent R&DIs, as well as African networks of HEIs, such as ANAFE and RUFORUM and their constituents are increasingly aware that building effective innovation systems calls for a paradigm shift and fundamental institutional change in R&DIs and in HEIs. FARA refers to this new paradigm as Integrated Agricultural Research for Development (IAR4D). International organisations such as CTA and ICRA (with support from EIARD) and many others are supporting this shift towards innovation systems with policy advocacy and capacity building activities.

This paradigm shift in R4D can be characterised by a shift ...	
from ...	to
seeing knowledge generation as a final objective	seeing it as a means to achieve change
research	innovation
a focus on technology	a focus on people
mainly reductionist understanding of the parts	systemic understanding of the relationships between the parts
mainly ' hard systems analysis ' (improving the 'mechanics' of the system)	also ' soft systems analysis ' ('negotiating' the meaning of the 'system' and desirable transformations)

This paradigm shift in R4D can be characterised by a shift ...	
from ...	to
seeing participation as a matter of ' consulting beneficiaries '	seeing participation as ' facilitating interactive learning between stakeholders ' resulting in joint analysis, planning, and hence collective action
working individually	working with others , in ever-changing ad-hoc teams and partnerships
teaching, being taught and individual learning	learning, learning how to learn and social learning
an exclusive focus in the culture of R&D organisations on individual merit and competition	a focus that also favours collaboration and teamwork

Source: Strengthening capacity for rural innovation. Building skills, changing outlooks, ICRA Annual Report 2007.

At the global level, rapid innovation in agricultural research is driven by new issues (climate change, bio-energy, changing food habits due to urbanisation, epizootics, etc.) and the application of new disciplines (biotechnology, ICTs, nanotechnology, robotics, ecology, etc.). This research takes place in private sector companies and in international research networks in which emerging economies, such as Brazil, Russia, India, China (BRIC) and South Africa, play an increasingly important role next to the traditional OECD member countries. The resources involved in this research are beyond the means of most industrial countries and this stimulates international collaboration next to competition. Northern researchers focus on this international research collaboration and are less and less attracted to R4D in the South, in which young scientists see no career perspective. At the same time, few researchers from SSA participate at this international level and, if they do, they are often no longer connected to R4D. New mechanisms are thus needed to reconnect the R4D community to the global research community, without compromising its focus on R4D, and to link these global developments to the MDGs and local, national and regional priorities for equitable and sustainable development in the South. SSA countries also need at least a minimal competence in areas such as biosafety and biotechnology to inform national and regional policy making.

Enhancing research capacity in the context of innovation systems

The changes in the context and paradigm of R4D have created new needs to build human and institutional capacity required for effective innovation systems. One important difference from past efforts is that the new paradigm requires enhancing the capacities of *all* actors in the innovation process to collectively play their part, and not only those of the R&DIs and HEIs and their staff. These capacities include the ability to jointly learn from each other and benefit from the diverse competencies of the actors to find adequate solutions (negotiated compromises) that add value to and go beyond their individual contributions. For this to work, the actors need the ability to understand – and, even more importantly, the mindsets to respect – each other's goals, world views, values, validation criteria and procedures, etc. They need new skills to jointly plan and manage multi-actor innovation processes and to empower each of the actors and level the playing field for the articulation of demands and interests. Each of the actors also needs to develop the capacity to organise and effectively represent his (empowered) constituency.

In order to develop these capacities, FARA, the SROs and the African networks of HEIs are calling for new ('business unusual') research/innovation and education programmes. They promote significantly enhanced strategic collaboration between African, Northern and CGIAR R&DIs and HEIs in long-term comprehensive research for development/ innovation programmes involving all key actors in agricultural sector development. This means a much more active

involvement of HEI staff and students in resolving problems in innovation processes through post-doc and PhD research and supporting MSc research. It also means introducing a culture of inter- and transdisciplinary research and building the capacity for this.

The new higher education that is needed comprises more relevant (new) disciplines for agricultural innovation, including biotechnology, ICTs, agri-business administration, market and policy research, international trade, law and intellectual property rights. In this new education, disciplinary specialisation needs to be combined with an ability to work with other disciplines and non-scientific partners in addressing complex issues with direct practical relevance for poverty reduction and other MDGs³. This means developing transversal capacities for interdisciplinary teamwork, inter-institutional partnerships, practical problem-solving, interactive transdisciplinary learning. As indicated, this requires the involvement of non-scientific innovation partners in the design and delivery of education programmes and various forms of ‘fieldwork’ and internships in teams to involve students as partners in actual innovation processes. This embedded experiential learning then forms the basis to develop adequate mindsets and process skills in students and teachers/researchers.

This extra-disciplinary learning requires time (formal credits), structures (e.g. inter-departmental chairs on innovation processes with interdisciplinary groups of teachers from different departments/disciplines) and new mechanisms to coordinate between the disciplinary and interdisciplinary elements of the education programmes, so that specialised curricula adequately prepare their students for the interdisciplinary elements. This implies loss of independence and power of each individual department, commitment to common objectives and social control, loss of power over evaluation of students and more ‘contractual’ relationships between all partners in the innovation process. It also often demands working at the pace dictated by realities outside the R&DIs and HEIs and implies a fundamental redefinition of the job of researcher or teacher. These things do not just happen, but need carefully planned and managed participatory/inclusive change processes that takes time and considerable investments to overcome resistance.

The new education also requires a fundamental change in the approach to teaching and student assessment, from transferring and reproducing information to facilitating learning to access, use and generate knowledge for the resolution of practical problems. New assessment instruments need to be developed to assess behavioural competencies of individual students in teams, to assess team competencies (processes) and the quality of team products (as against individual products that academic assessment systems focus on). Some of these instruments may involve forms of ‘peer’ review among students.

Both for R&DIs and HEIs, working in innovation systems also requires a change in staff evaluation culture, mechanisms for performance assessment and promotion, and career incentives. This needs to focus on the entire innovation chain, i.e. not only on knowledge generation per se, but also on generating knowledge that works through adaptation resulting from interactive learning between scientific, business, policy, producer and civil society partners in the innovation process. Assessments also need to include knowledge communication and scaling up and out and mechanisms need to be developed to involve the non-scientific partners in collective innovation processes in the evaluation of R&DI and HEI staff. These assessment mechanisms need to be geared to promoting a culture dedicated to achievement (effectiveness and efficiency) in poverty-reducing innovation through teamwork and multi-actor partnerships oriented towards integrated change in policy, markets, organisation and technology.

A final area requiring substantial development of new capacity is that of transparent and participatory M&E to guarantee continued focus on shared objectives and benefits of the partners

in the innovation process and promote continual joint reflection on experience, drawing lessons from this, defining improved practices on this basis and incorporating these in future activity plans. This also requires new competencies in documentation and capitalisation of processes and related experience.

Scope for international cooperation in research capacity building

The important role of FARA, the SROs and the African networks of HEIs, such as ANAFE and RUFORUM, in this new area of research capacity building has already been sufficiently referred to in the foregoing. The international donor funding for their capacity building functions remains limited to a few projects and donors, such as the SCARDA project (Strengthening Capacity for Agricultural Research and Development in Africa), funded by DFID. Other projects, such as FARA's Building African Scientific and Institutional Capacity (BASIC), have as yet not found donor support. There is still considerable scope for further synergy between these and other initiatives at the continental and regional level.

Dutch government policy uses several mechanisms to contribute to building research capacity for R4D in the South. These include instruments for bilateral collaboration, such as the NPT and NFP programmes, core funding for Wageningen University and Research centre and other Dutch HEIs, and the multilateral Dutch contribution to the CGIAR⁴ and to ICRA. Dutch policy makers are also involved in the ERA-ARD project that aims to promote collaboration between national funding mechanisms for agricultural R4D in the 15 participating member states of the EU and includes a research capacity development component. Dutch R&DIs and HEIs make use of European and other international funding instruments to support R4D collaboration, such as the international dimension of the Framework Programmes.

The competence that most Dutch R&DIs and HEIs offer to these bilateral and multilateral efforts is mainly of disciplinary, applied and sometimes multi- or interdisciplinary nature, and more focussed on 'technical' content and skills than on processes, management skills, institutional change, new approaches to learning and student assessment, etc. For the Dutch knowledge institutes to make an effective contribution to building the new research capacities for innovation systems, this content-oriented offer needs to be balanced with a process-oriented offer, which may require new partnerships with non-academic institutes. This would also require opening the project identification mechanisms to also include process-oriented demand.

With the aging and progressive retirement over the next decade of the traditional Dutch and European ARD community with experience in R4D and commitment to poverty reduction in the South, new ways need to be found to engage Northern competence in building the new transversal research capacities for innovation, as well as for the old and new disciplines needed. Resources to maintain a specific R4D expertise have dwindled in most of Europe over the last decades and very few young Europeans see a career perspective in development oriented agricultural research. If the Netherlands – either nationally or in the European context – are to play a role in research capacity building in the future – for which having national expertise is a prerequisite – they will have to source this expertise from young Dutch and Southern researchers involved in global research collaboration networks working in these fields and by providing them with incentives to dedicate a few years of their career to R4D priorities. The involvement of Southern researchers is a prerequisite, as the Europeans involved will miss first hand knowledge of the conditions in the South. Both Dutch/European and Southern researchers will need to learn to work effectively with multi-actor platforms in the South. This temporary involvement of young, innovative and dynamic internationally operating researchers in R4D will not be achieved

spontaneously, but will require stronger and more targeted instruments than the current NPT or Framework Programmes, linked to more long-term programmes that go beyond research collaboration and include a much stronger emphasis on building and maintaining effective R&DIs and HEIs in the South, empowerment of other innovation partners, etc.

Notes

¹ The author, Jon Daane, is Director of the International Centre for development oriented Research in Agriculture (ICRA), a European centre specialised in building research capacity for rural innovation. He has been full-time professor at the Faculty of Agriculture of the National University of Benin (currently University of Abomey-Calavi) for eight year and coordinated several PUO-projects to build HEI-capacity in Africa. Tel.: +31 317 422 938; email: jon.daane@wur.nl; website: www.icra-edu.org.

² The example of South Africa is illustrative in this respect. The country's public agricultural research organisation (ARC) has internationally competitive expertise related to commercial farming, but despite long term efforts dating back from 1994 the ARC has not yet fully built the capacity to also address the problems of what is called the 'second economy' of small scale African farmers.

³ Many (former) students and teachers acknowledge that they have received a good technical/subject matter/disciplinary education, but lack the transversal competencies to deal with the complex issues (cutting across disciplines, organisations, geo-temporal and hierarchical scales) they face in professional life.

⁴ The contribution of the CGIAR to building research capacity for innovation systems in the South shows a mixed picture. While some centres individually developed initiatives towards working in an innovation systems mode (e.g. CIAT's Rural Enterprise Development, the INRM initiative, ILRI's Enabling innovation programme), these remained relatively marginal within the centres. The centres' role in the Sub-Saharan Africa Challenge Programme (SSA-CP) seems more motivated by the need to be involved in all CPs than by enthusiasm for FARA's IAR4D. The system as a whole degraded ISNAR from a centre to a marginal, research-focussed programme rather than using its potential to become a much needed instrument to build capacity for innovation and change. The Science Council promotes a focus on science per se and does not seem to value the innovation initiatives of the centres. The capacity of the system to work in equal partnerships with non-science stakeholders is limited.

Bibliography

A list of some 25 documents consulted for this paper will be added to the final version.