

**DFID – E-Forum  
New Directions for Agriculture in Reducing Poverty**

**SCIENCE AND TECHNOLOGY:**

**Moderator Team:** George Rothschild

**Synthesis of key outputs**

**INDEX**

[Objective and Key Questions](#)

[Key Questions Asked](#)

[Theme Outline](#)

**Moderators' Messages and Summaries**

[Welcome message, 30 March 2004](#)

[Summary, 24 April 2004](#)

[Summary, 19 May 2004](#)

[Summary, 28 May 2004](#)

[Final Summary, 3 June 2004](#)

[The Entire Theme Archive](#)

## **Objective and Key Questions**

**The consultation aims to seek views, opinions and examples of innovative and established practice in order to inform future DFID policy and investment. Your moderator will lead the debate with the short introductory paper below, provide regular summaries and guide the dialogue.**

### **Key Questions Asked:**

**How can DFID help to increase access to agricultural science and technology?**

### **Theme Outline – prepared by George Rothschild, 30 March 2004**

1. This theme makes two basic assumptions. Firstly, overwhelming evidence from both the developed and developing world demonstrates that agricultural science and technology (AST) is an essential pillar of agricultural growth. Secondly, that agricultural growth itself is the principal precursor (“engine room”) of overall economic growth, including industrialisation. DFID clearly accepts both assumptions as a “given”, most recently in its policy paper entitled *“Agriculture and poverty reduction; unlocking the potential”* (December 2003). Thus, participants in this E-forum need not reiterate how important AST is for agriculture, or how that sector contributes to economic growth and poverty reduction. Rather, this section of the consultation will provide an opportunity for participants to raise and debate ideas and practical proposals on how DFID might best gain access to AST, its role in generating new knowledge, how it should use AST knowledge to greatest effect in its programmes, and, in that regard, what outcomes it should be aiming to achieve.

2. Agriculture as defined here includes crops, livestock (and bush-meat), forestry, fisheries and overall natural resources management. AST is defined as the full cycle of problem identification, research, promotion and application, coupled with capacity building. AST generates technologies, policies and strategies, which differ according to whether they target the very poor at subsistence level, those emerging from poverty, or those engaged in commercial farming.

#### **How does DFID presently acquire its AST?**

3. There are many sources of information on AST, including both knowledge managers/publishers such as FAO, and generators of knowledge including the CGIAR centres and other international research institutions, CABI, scientific institutions in the UK and other OECD countries (largely but not exclusively in the public sector), as well as major institutes in the stronger economies of the developing world such as China, India and Brazil. Since 1995, DFID has relied on these diverse sources for its AST, but the first “port of call” has usually been its ten outsourced Renewable Natural Resources Research Strategy (RNRRS) programmes, as well as its own natural resources advisers located centrally and in some DFID in-country offices. The RNRRS programmes have responded over the past nine years of their existence to major changes in the development scene

that have occurred in DFID and the international development scene more generally.

4. The changes referred to in point (3) above, have meant that the poor beneficiaries of AST have become centre stage, rather than AST itself. The highest priority is thus given to the development of enabling policies, knowledge dissemination and uptake, as well as the requirement for pro-poor AST research to be demand-led and participatory. The focus on poor people and their livelihoods has led to greater efforts to integrate technical and social research, and for this to be an integral part of mainstream development. Having said this, DFID and other donor agencies are still struggling to establish mechanisms for effectively integrating AST research, development, dissemination and application within a meaningful continuum. Equally, there has not been an associated long-term strategy for capacity building and institutional strengthening for AST in developing countries, without which sustainability of effort cannot be achieved. DFID's RNRRS programmes have managed to undertake some capacity building through partnerships, despite limited resources and mandate restrictions. Involvement of DFID in-country offices has been patchy and highly dependent on the interest of individual NR advisers.

### **How does DFID plan to access and use AST in the future?**

5. The stated intention of recent and ongoing reorganisation of rural development activities in DFID is to respond to the evolving challenges. This has led to closure of the Rural Livelihoods Department, and the creation of a Central Research Department and a new Agriculture Team within the Policy Division. The RNRRS programmes were to be terminated by March 2005, but have had a one-year extension while the new DFID research strategy is being developed. DFID has been undertaking a number of scoping studies and other activities to assist with this task, and the next 18-24 months will be devoted to a range of further activities including a full assessment of the RNRRS programmes to build on experience gained in the latter and lessons learned. DFID hopes that consultations, such as this E-forum, will contribute to this process

6. The specific remit of this theme is "how does DFID increase its **access** to AST". However, given that it is planned to use the forum as a source of ideas for the new research strategy, it will be more meaningful to put the question of access in the context of how AST (broadly defined – see above) will actually be **used** and incorporated by DFID into its mainstream development agenda.

### **Possible issues for discussion**

7. It is hoped that participants will generate and debate ideas and practical options as to how DFID should improve its access to, and use of, AST, as well as its role in supporting the generation of new AST. This is obviously a broad area for discussion. As a start, four "clusters" of issues and associated queries (underlined) are summarised below. These may help stimulate the debate, but participants will no doubt wish to highlight others.

(a) A major stated aim of DFID's programmes is to significantly reduce poverty (with special reference to the very poor) through agricultural growth. Given that the research needs for growth and poverty reduction are not necessarily the same, which AST knowledge sources are particularly appropriate for DFID? How should this information be managed and archived – giving due recognition to those who provide it, as well as to free access to all users? Should DFID play a role in supporting international and regional networks?

(b) The above refers to “on the shelf” information on AST. DFID has contributed significantly to the generation of new knowledge through its support to partnerships involving institutions in developing countries, the UK science base and that of other OECD countries, CGIAR centres, and other agencies. Should DFID continue to do this, and if so, through which mechanisms? What role could the private sector play in this, given that much pro-poor AST aims to produce public goods, and how might DFID encourage the private sector’s involvement?

(c) Few development agencies have successfully integrated research into their mainstream development programmes, as their organisational structure and operations often pose constraints to this happening. How might DFID properly address this issue in terms of the research-development-application continuum to ensure greater developmental impact? Should DFID strengthen its in-house technical expertise in AST to assist in this task? What should be the respective roles of DFID central units and in-country offices in this? How might DFID help ensure that research outcomes are piloted in demonstrations and then more broadly applied at the local/national level? How could this be coupled with capacity building and institutional strengthening, which is of crucial importance? What role could the private sector play in technology transfer/application, and, as in (c) above, how might DFID encourage this?

(d) DFID has emphasised its commitment to budgetary support for developing countries to enable them to identify and address their own priorities, including AST, for poverty reduction – aided by poverty reduction strategy programmes (PRSPs). Although most of the poor are in rural areas and dependent upon natural resources, the national agricultural systems of many developing countries are weak in financial and human resource terms, and as a consequence agriculture is usually given low priority in PRSPs. Given this scenario, what are the advantages and disadvantages of budgetary support for AST as opposed to technical assistance, and how could these be translated into recommendations to DFID?

## **Welcome Message from George Rothschild – 30 March 2004**

Welcome to Theme 5 on "Science and Technology" in DFID's e-consultation on "New Directions for Agriculture in Reducing Poverty". I have prepared a short introduction to this Theme with some ideas on issues for debate to start the process moving, but participants will no doubt have many others. We look forward to frank and lively discussions on this important topic that will in turn help provide practical options for DFID to consider in developing its agriculture strategy.

The outcome of the discussions on the other five Themes will also be important, as they will provide the developmental context necessary to ensure the relevance of agricultural science and technology for poverty reduction. Weekly updates will be provided as the e-consultation progresses.

Thank you in advance for participating in this theme and I look forward to moderating this debate.

## **Summary from George Rothschild – 24 April 2004**

Dear Colleagues

We are now into week two of the E-forum on new directions for agriculture in reducing poverty ? that among other objectives aims to assist DFID in developing its new strategy. We have been able to launch the Science and Technology theme of the forum with two good contributions - from Marcel Nwalozie of CORAF/WECARD and Dana Dalrymple of USAID. These are briefly commented on below. This is a good start, but we are now anxious to hear from others who have registered for this consultation, and any of their colleagues as well. Please do join in the debate. We have three weeks more to go. Any comments that you wish to make will be most welcome ? brief or long, provocative or otherwise. It is a great opportunity for you to influence DFID's future policy on agricultural science and technology (AST), as well as broadening the debate on this theme among all those involved in the developed and developing world.

Turning to our contributions to date, a few of the points made are summarised below:

Using CORAF, one of three sub-regional organisations in Sub-Saharan Africa, as an example, Marcel Nwalozie has highlighted the important contributions that sub-regional organisations are making in the developing world, by promoting research cooperation between several countries on a longer-term strategic basis. In addition to the synergies created, the spillover process is enhanced through the inclusion of international partners such as the CGIAR. Marcel considers that such approaches may provide a valuable operational model for DFID to consider.

Dana Dalrymple discusses issues raised in the AST theme, but leads off in his contribution to the debate with more general comments on the introductory papers by Michael Lipton and Simon Maxwell. He agrees with Michael Lipton's view that the emphasis of research should be on food staples, given the potential to reduce prices significantly, and thus benefit poor consumers, but also points out that this can impact adversely on those poor producers who are late in accessing the new technologies. This has led some analysts, such as Simon Maxwell, to suggest that high value commodities may have greater potential, but Dana feels that their production may often be beyond the means of poor producers.

In addition to his more generic comments on poverty reduction and economic growth, Dana also provides some preliminary responses to the more specific issues raised in the introductory paper on AST. In terms of the generation of new knowledge, he feels that there is a need to distinguish between productivity-maintaining research and productivity-enhancing research; both are needed but the balance between the two will vary with commodity.

Dana feels that, given the low level of private sector investment in AST in the developing world, the main support will continue to have to come from the public sector. In this regard, he believes that DFID should continue to play a major role in supporting the generation of new knowledge, and use the CGIAR and other international AST organisations as a major, but not sole, avenue for achieving this.

In terms of good institutional structures and mechanisms for generating and utilising AST, Dana considers that no donors have yet come up with good solutions. The main problem is that AST requires long-term support based on a strategic vision, whereas most mainstream development highlights economic assistance designed to achieve highly visible outcomes as rapidly as possible ? thus favouring short-term activities. The latter is often associated with frequent organisational restructuring. Dana considers that it is essential for research to be endorsed at the highest level in development agencies, but recognises that this is a rare occurrence. Both centrally managed and field-based activities are required, and the central office should have a well qualified AST team, who are not regularly shifted around, as in the case of those in foreign service

In terms of programmes, Dana notes that central offices in USAID have tended to fund work on international public goods, while regional/country missions have supported that on public goods of more local relevance. CGIAR regional/national programmes have placed greater emphasis on the utilisation of research outcomes, capacity building and institutional strengthening. Private sector involvement in AST for the developing world has been limited so far, and largely confined to biotechnology.

Turning to the issue of programme budgetary support, Dana feels that this is not incompatible with effective technical assistance, but that an appropriate balance is needed. He notes that USAID has, like other donor agencies, found that the only effective way of generating and delivering research outcomes is for this to be demand-led. In this regard, the regional/country missions have increasingly been the major source of funding for programmes where technical assistance is integrated into a larger mainstream development activity.

Clearly, both Dana and Marcel have provided plenty of food for thought in kicking-off this E-debate on AST, so, as noted earlier, please let us have your thoughts on any issues related to this theme.

Thank you.

## Summary from George Rothschild, 19 May 2004

Dear Colleagues,

Firstly, my sincere apologies for this belated summary of where the debate on the Science and Technology theme has now taken us - taking into account contributions received over the past three weeks up to 16 May. This delay was largely due to the unanticipated arrival of an unwelcome viral visitor within my PC, despite all the usual anti-viral protection measures. The virus corrupted many of my files and access to the Internet. All is now hopefully well.

Please note that later today. I will be posting a covering note that will list six points arising from the summary that I believe need further teasing out in the last week of the E-forum, as these will not be readily apparent from the extended summary below. Thank you for your continued interest in this theme.

### A. PROGRESS TO DATE

2. It has been gratifying to see that that the level of participation has risen significantly over the past three weeks, and that people continue to register for this theme, including a few more from developing countries - although the overall number of colleagues from the "South" is still rather low. I know that this is in part due to electronic access problems encountered by some registrants, but as the overall process moderator, Felicity Proctor, has indicated, please do use the help team whenever you have problems

3. One recent development at DFID that has special relevance to our theme has been the release last week of the draft Research Funding Framework for 2005-7, which will form the basis for DFID's strategy for all sectors, including agriculture. This has been issued by DFID's Central Research Department (CRD), and comments are invited on the draft before 9 July. This is of course a separate exercise to the E-forum that we are now engaged in, so save your comments on the Funding Framework for those requesting them at CRD. The draft is, however, very relevant to our present E-debate as it provides insights into current thinking within DFID. You can access the document at: <http://www.dfid.gov.uk/PolicieAndPriorities/knowledge/altsra1.doc>, but I have also arranged for it to be posted on the consultation website.

4. Returning to the AST theme, there has been a wide range of contributions, which have addressed the questions, as Jill Lenne, succinctly put them, of "What", "How", "Which" and "Who" and in some cases also "When". The questions on how we might advise DFID that I posed in my moderator's introduction could have usefully been put under those simple headings. In her last process moderator's summary, Felicity Proctor, emphasised that with the closure of the debate in less than two weeks time it would now be important to try to focus on a number of key issues that DFID should give priority to if it was to make meaningful use of AST in its development programmes. No doubt each of you will have a range of different ideas in this regard, but there will undoubtedly also be considerable consensus.

5. I will attempt to summarise recent contributions firstly for those relating more directly to AST, and then, in a brief separate summary, those addressing some aspects of extension, which were recently re-directed from the "Growth and Poverty" theme.

## B. WHAT PRIORITIES FOR AST SHOULD DFID SUPPORT/HELP GENERATE?

6. In her contribution to the E-forum, Jill Lenne has argued that it is important to clarify the "What" before moving on to the "How", "Which" and "Who". A number of contributors implied that there was widespread international recognition of the high priority of agriculture (defined broadly) in addressing the MDGs, and they therefore focussed on the other questions. Relatively few participants in the S&T theme discussed "What" in terms of what priority DFID might accord agriculture, and more specifically AST, as opposed to other sectors. - but this received adequate coverage under other themes, particularly "Growth and Poverty". Simon Maxwell and Michael Lipton addressed some generic issues of agricultural priorities in their respective introductory messages for all themes, and had somewhat conflicting views on pro-poor strategies for the sector.

7.: Michael argued for the need to improve staple food production by smallholder farmers as an essential precursor to other avenues for moving out of poverty such as income generation through cash cropping and off-farm / non-farm employment. Simon challenged what he called conventional wisdom, and argued that growth in the agricultural sector would result from greater priority being given to commercial production of cash commodities rather than food staples, with smallholder agriculture making way for such systems. Employment opportunities for the poor would be created in commercial farms and other rural enterprises or non-agricultural activities. Mike Lipton reiterated his arguments for smallholder/ staple food focus in a later contribution to the Growth and Poverty theme. This issue might be pursued a little further by participants in terms of the AST agenda for DFID. Those only following the S&T theme might usefully refer to the last moderator's summary of the Growth and Poverty theme in which the arguments for supporting AST on commercial-scale or smallholder farming are summarised. Perhaps, these are better regarded as complementary rather than as alternatives?

8. Dana Dalrymple feels that overall there has been far too little attention given by development agencies and others to the likely world food situation over the next few decades. Some of the scenarios cited on the basis of IFPRI projections are worrying. In this regard, there has also been little reference in this theme to the challenges posed by continued population growth in the developing world on food security, especially Africa.

9. (As an aside, for those interested, these broader issues have also been discussed in the recent AgREN e-mail discussion Rural Livelihood Diversity and its implications for pro-poor agricultural research and extension - 22 March - 2 April 2004. See website: <http://www.rimisp.org/agren04>. I will endeavour to get a copy of the final synthesis report posted on our website).

10. On more specific aspects of "What", contributors have provided a wide range of ideas on priorities for AST, and there have been differences of opinion on whether priorities should be demand-led - identified by the poor, or by researchers - supply driven. This also applies to the extent to which end-users are involved in other stages of the research and development phases. Dana Dalrymple, Curt Farrar, Robin Matthews, and Alan Cork and some others have argued that the two approaches are complementary, and that an appropriate balance needs to be established between the two. This will depend on whether the problems being addressed by AST are local, national or international - with the first having a high level of involvement of the rural poor, and the international

problems, where researchers will often be the main players; national issues will have a balance of both researchers and users as well as other stakeholders. There was a feeling among a number of contributors that pressure from some donor agencies for researchers conducting strategic research to be fully participatory with all stakeholders throughout projects had become unreasonable and counterproductive. Dana Dalrymple has provided a publication on this topic, which is posted on the website under the S&T theme.

11. Richard Gibson and several other contributors have highlighted that, although the impact of agricultural technologies is dependent on other linkages in the development "chain", such as trade/markets, education, health and so on, significant benefits can be delivered to the poor through improved technologies even if these other elements are not all in place. His examples include the production of disease resistant food staples such as cassava and sweet potato. There appears to be overall consensus among participants on the need to ensure that pro-poor AST has a strong social science component to ensure relevance and likelihood of uptake - among other considerations.

12. Many contributions to the E-forum on AST priorities have had a cropping focus. Pro-poor research on livestock, including pastoralism in marginal areas, has been raised by Ade Freeman and several other contributors as a significant AST priority. The sub-sector is growing at a very significant rate in the developing world in association with changing food consumption patterns. Livestock often represent the single most valuable asset for the rural poor, and a number of key issues are flagged that could be the focus for research - related to the linkages between livestock production and poverty reduction.

13. Jill Lenne and David Harris and several others see biotechnology as an increasingly important component of pro-poor AST, but David Gibbon cautions that its scope is still limited in terms of addressing the current major problems of the poor. A number of NGO contributors, including ActionAid express concerns about intellectual property and GMOs, and the need for appropriate regulatory mechanisms, which most participants will be very familiar with. Dave Harris points out that these negative perceptions are largely associated with multinationals, and could be in part addressed by greater public sector engagement in biotechnology. This has been a feature of activities commissioned by several RNRRS programmes.

14. There have so far been very few references to AST on forestry or fisheries in the debate, other than a brief comment on post-harvest fisheries and another on agroforestry. Hopefully, further comments will be forthcoming before closure of the E-forum.

15. In identifying priorities for AST, a number of overarching issues have been raised. These have included the need to consider gender (Sophia Huyer and Diana Lee Smith), and to develop new perspectives on the livelihoods of the poor in the rural-urban continuum, moving away from the long-held perception of a physical and social divide between city and countryside (Diana Lee-Smith, Gordon Prain, David Gibbon and several others). Differing views on off-farm employment in rural and per-urban/urban areas have also been offered by Moses Ochieng and James Biscoe, highlighting the complexity of these issues. David Bourn reminds us that there has been little mention in the E-forum so far of another MDG, namely that of ensuring environmental sustainability in developing pro-poor agricultural research and development options. He points out that DFID previously had unique capability in assessing the impact of changing land use on the resource base and in developing sustainable options, and that this should once again be on DFID's agenda. In this regard, the unsustainable use of water

resources in raising agricultural productivity and the need for AST to address this problem has been raised by several contributors, including Rob Moss and Dick Tinsley.

16. Robin Matthews discusses the issue of low external input (LEIA) and high external input agricultural (HEIA) technologies in terms of sustainable development. He concludes that both have strengths and weaknesses, but questions whether they have the capacity to meet the requirements of a growing population, and points out that both require considerable resources: HEIA for capital to purchase inputs and LEIA in terms of large labour and land requirements.

17. Robin also emphasises the importance of adopting a multidisciplinary systems approach in addressing AST priorities, and questions the continuing tradition of discipline-based programmes, such as the RNRRS, given that there is relatively little evidence of interdisciplinary collaboration between them. One can take disciplines in this context to also include commodities (crops, livestock, forestry, fisheries). The mandates of most CG centres have a similar basis. Donor development agencies, including DFID, appear to be increasingly uneasy with this system and have been moving towards broader thematic approaches in development - to which AST contributes on a multidisciplinary basis. Given that most AST institutions in the developed and developing world are based on disciplines (or commodities), it can be deduced that this has arisen through evolution rather than revolution. This means that it may be challenging to achieve change. It would be useful to get participants to this forum to express their views on this issue, as it has major implications for the way that DFID may support AST.

18. Before moving on from the "What" aspects of this summary, it is however worth mentioning Andy Bullock's contribution on the Public Service Agreement (PSA), through which DFID is accountable to the UK Treasury, and which essentially governs what DFID can and cannot do over the next few years through to 2006. The objectives of DFID's PSA are therefore very important, and Andy points out that agriculture is not mentioned anywhere, and hunger only once. In contrast targets are set for poverty, child and maternal health, HIV/AIDS and education. It has to be implied that agriculture is covered indirectly in the PSA, but there is clearly a case for this to be addressed when the next Agreement is drawn up

19. Given the number contributions on the "What" aspects of AST over the past three weeks, I have ended up with several pages of summary. From their contributions, it is apparent that some participants consider that in the context of this particular E-forum, "What" may be less important than the "How", "Which" and "Who". This probably stems from the way that the questions were posed in the S&T moderator's introduction. Clearly not all agree with this view. However, it can be said that the priorities for pro-poor AST have been addressed elsewhere by many other individuals and agencies - including fairly recent reviews by government institutions including universities, as well as the CGIAR, international financing institutions, and many donor agencies. So, there is a wealth of information available - if one knows where to look for it.

20. Contributors have said that issues of "How", "Which" and "Who" in terms of DFID support for AST have proved more difficult to address, but nevertheless several have given much thought to these questions, and the following section attempts to summarise their views in the context of the DFID-oriented questions that were posed in the moderator's introduction to this theme.

### C. HOW SHOULD DFID SOURCE ITS AST KNOWLEDGE, AND MANAGE THIS ?

21. There is agreement among most participants addressing this issue, including Robin Matthews, Jill Lenne and Jock Campbell, that AST knowledge is best derived from a wide variety of sources, given the range of development needs of the poor. This includes public sector organisations in the UK and elsewhere and international institutions such as the CGIAR as well as the private sector. Direct commissioning of work through for example the RNRRS is seen as means of addressing very specific problems. Competitive systems of funding need to be maintained to help ensure quality of AST.

22. A number of contributors feel that DFID is unique in terms of the vast amount of information that it and its predecessor ODA has accumulated over the many years, and that this needs to be maintained and properly resourced as a readily accessible resource for developing and developed countries. Jill Lenne points out that the most comprehensive library on tropical agriculture in the world at NRI in the UK is now "moth-balled" in storage that is not readily accessible.

23. Several contributors remind us that this knowledge resource is also of crucial importance to DFID itself as a source of information for taking stock of lessons learned from past AST. DFID could also make a major contribution to AST for development by acting as a knowledge broker. This would require appropriate levels of resources in terms of people and funds - perhaps through whatever follows on from the RNRRS programmes?

24. The issue of in-house capacity technical capacity at DFID is relevant here, and indeed more generally, and a number of contributors have highlighted the erosion of such capacity in recent years, particularly at the senior levels. Contributors with experience at USAID, Gary Alex and Dana Daly, consider that this issue needs to be addressed both centrally and for the in-country programmes. It is touched on again in Section F.

### D. SHOULD DFID CONTINUE TO SUPPORT THE GENERATION OF NEW AST KNOWLEDGE THROUGH PARTNERSHIPS BETWEEN THE UK SCIENCE BASE AND THAT OF OTHER DEVELOPED NATIONS, THE CGIAR AND OTHER ORGANISATIONS, AND THE PRIVATE SECTOR - IF SO, HOW?

25. Many contributors were concerned that a view prevailed in a number of donor agencies, including some parts of DFID, that there was enough AST information on the shelf and the major current constraint was how to get this applied. There was clear consensus that given the many challenges of addressing the needs of the poor, it was essential for new AST knowledge, both strategic and applied to be derived through high quality research. The major question is what aspects of this should DFID be funding and by what mechanisms? It was generally felt that the outsourced RNRRS programmes had proved to be effective, but Robin Matthews was concerned about the weakness of the linkages between DFID and institutions supported by the UK research councils. It was recognised that the latter emphasised fundamental research for the benefit of the UK and the "North", but some of this was also of considerable relevance to the developing world. This issue is currently under review by two parliamentary committees as noted by the E-forum process moderator.

26. Several contributors had concerns with DFID's emphasis on achieving rapid impact, and as a consequence, the short-term nature of funding. As Robin

Matthews points out this means that key issues such as the impact on the natural resource base of agricultural intensification, both commercial and smallholder, which are only apparent after a longer period, fail to receive funding.

27. There were mixed views on DFID's support for the CGIAR. A number of participants with long experience of working at CG centres felt that the CG system is currently experiencing significant problems in terms of leadership and governance as well as reduced scientific capability in a number of key areas, and that this has been exacerbated by funding problems for many centres - in part attributable to top-heavy management and high overheads. This combination of factors has led to the departure of many world-class scientists. Concerns were expressed that increased funding for the CG centres might be used for "survival" strategies rather than major pro-poor initiatives in the agreed agenda, if this support is to be provided as unrestricted core grants without appropriate accountability.

28. Having said this, contributors have also highlighted good examples of partnerships with the CGIAR that include the DFID-funded PETRRA programme for rice research in Bangladesh and promotion of fodder technologies in South Asia and West Africa. These are long-term, with clear objectives to address major problems, and are fully accountable in terms of how resources are allocated.

#### E. HOW CAN DFID BEST USE AST IN ITS DEVELOPMENT PROGRAMMES, AND DOES IT NEED IN-HOUSE CAPACITY TO DO THIS?

29. Several contributors, including Jock Campbell, remind us that S&T provides a basis for the evidence-based approach, often cited by DFID, that is needed to ensure greater likelihood of success of development activities. Jill Lenne as well as Robin Matthews and David Harris emphasise the crucial need for AST to be fully integrated with mainstream development, if it is to have any chance of contributing meaningfully to poverty reduction. Failure to establish research-development-application continua is widespread in most donor agencies, including DFID. This requires that AST is built into mainstream development projects/programmes right from the outset - from problem identification onwards. This will help address the perennial problem of a valuable AST outcome never reaching its intended beneficiaries because of lack of support for development and application. Robin Matthews and several other contributors have highlighted the need for DFID's in-country programmes to engage with the RNRRS programmes, as the former have the main responsibility for interacting with national governments, and also have good linkages with local NGOs and the private sector.

30. Several contributors point out that most RNRRS programmes have attempted to do this, but without any formal mechanism for linking with DFID's mainstream development activities. The current fragmented approach means that there is discontinuity in support to take outcomes of research further downstream, with the associated loss to the programme of key developing country partners as well as those in UK institutions or elsewhere. The need for a "joined up" approach may represent one of the "big issues" for DFID in terms of how effective its new research strategy will be. Jill Lenne considered that DFID has achieved especially good returns on its long-term investment in programmes, including the RNRRS, that have supported effective partnerships between the CGIAR, advanced UK research organisations, and developing country research and extension agencies, as well as civil society organisations and the private sector. She argues that DFID

should use such successful partnerships as one model for its new research strategy

31. The contributions of Moses Ochieng and Andy Hall raise important issues on AST and innovation. Andy points out that little emphasis is placed by most donor agencies, including DFID, on building capacity of local agricultural innovation systems that promote learning and knowledge sharing and active participation of stakeholders. Andy suggests that DFID could pilot such initiatives by funding in-country research programmes that are more closely aligned with rural development programmes. Research institutions in the UK, and elsewhere, could act as the knowledge source for these local innovation systems. He suggests that funds for this could be diverted from the RNRRS programmes.

#### F. WHAT ROLE SHOULD DFID PLAY IN AND CAPACITY BUILDING AND INSTITUTIONAL STRENGTHENING ?

32. Most contributors to the E-forum have emphasised the vital importance of capacity building and institutional strengthening if partner developing countries are to establish and maintain effective programmes of AST. Good examples are provided by Jock Campbell. Effective programmes of this kind have led to national institutions forming partnerships, developing strategic pro-poor programmes of their based on livelihood considerations.

33. Several participants have expressed strong concerns about the decline in funding for training young AST professionals from developing countries, given the undoubted success of such schemes and the impact on development in their own countries. The legacy of greater investment in the past is still apparent now, but steadily declining.

34. The issues of capacity building are not confined to developing country partners. Many contributors, including Jill Lenne and Robin Matthews, are greatly concerned about the impact of reduced support for AST on the scientific community, including that in the UK. The large-scale loss of scientists with unique experience in pro-poor development from many institutions continues, and as a consequence there is virtually no incentive for younger scientists to enter the development field. The impact on scientists of discontinuous funding for long-term research-development-application programmes of the RNRRS has already been alluded to earlier. A number of contributors consider that this will have a profound impact on the ability of the UK to maintain its internationally recognised status as a major contributor to international development. DFID is urged to establish schemes to support young professionals in development, similar, for example, to those of the IDRC in Canada and the Rockefeller Foundation.

#### G. WHAT ARE THE IMPLICATIONS FOR AST OF DFID'S MOVE TOWARDS GREATER BUDGETARY SUPPORT?

35. There has been relatively little comment on this to date. Following on from the previous question, Jock Campbell, points out that effective capacity building can lead to national organisations incorporating AST for development into the poverty reduction strategy programmes (PRSPs) and qualifying for budgetary support. He cites an example from Ghana in post-harvest fisheries where opportunities to use budgetary support were initially lost through failure to build local capacity, but that this has since been addressed successfully.

## Summary from George Rothschild, 28 May 2004

Dear Colleagues.

1. With just a day to go before closure, this is a short penultimate summary of contributions over the past week. I have used the same headings in the form of questions as in my last summary of 19 May, so as to keep uppermost in our minds six key issues that have emerged from the E-Forum S&T theme so far. There are others but it is now necessary to 'lump' rather than 'split' issues without losing the messages that need to be conveyed to DFID. Not all of the six headers are given in this summary, as there were no postings in some categories.

### A. WHAT PRIORITIES FOR AST SHOULD DFID SUPPORT/HELP/GENERATE?

2. James Cock makes the interesting point that it might prove possible to counter some of the concerns about global trading of commodities grown in the North undermining those produced in the developing world, by using R&D to make tropical crops more competitive – both in terms of the basic commodity and of value-added products. He points out that tropical crops, such as sugar cane, were competitive 50 years ago, and that failure to maintain their competitive edge was attributable in part to productivity declines linked to lower investment in R&D. He suggests that DFID could take selected commodities for 'modernising' and support a programme to achieve this with teams from the developed (including the UK science base) and developing world. He notes that new technologies, now available, but not earlier, could greatly accelerate this process.

3. The lack of reference to modelling in the E-forum so far is highlighted by Robin Matthews, who feels that this might reflect the lack of tangible developmental impact of some earlier projects on crop modelling. He considers that modelling could play an important role as a tool for examining the complex multidisciplinary livelihood systems of the poor, including addressing 'what if?' questions about the possible impact of interventions. Robin adds the caveat that there is a need to use models 'intelligently?', which could help address some of the concerns of Dick Tinsley about the use of complex models as proxies for direct decision support tools for small farmers. Robin points out that there is very little funding for modelling of the kind proposed – despite the contribution that this could make to more effective and efficient use of research for development.

4. Concern is expressed by some, including Stephen James, that a number of donors, and some parts of DFID, believe that enough strategic research has been done and that it is now an issue of applying the technologies already on the shelf. Stephen argues that this view is flawed, and there is an overwhelming body of evidence to show that new challenges requiring long-term research-based solutions arise almost continually in agriculture. This phenomenon is not confined to the agriculture sector, as dramatically demonstrated by the emergence of HIV/AIDS in the last decade.

### B. HOW SHOULD DFID SOURCE ITS AST KNOWLEDGE AND MANAGE THIS?

5. In terms of management of knowledge, Robert Arthur makes the important point that in analysing the impact of projects, too much emphasis is placed on successes. Research and development are recognised as being risky, so it is

equally, if not more, important to document and analyse partial or full failures if lessons are to be learned.

C. SHOULD DFID CONTINUE TO SUPPORT THE GENERATION OF NEW AST KNOWLEDGE THROUGH PARTNERSHIPS BETWEEN THE UK SCIENCE BASE AND THAT OF OTHER DEVELOPED NATIONS, THE CGIAR AND OTHER ORGANISATIONS AND THE PRIVATE SECTOR ? IF SO, HOW?

6. Based on briefings from colleagues involved in development, Stephen James makes strong call for DFID to use the UK science base more effectively. Inadequate use has been made by DFID of UK centres of excellence that are supported by the research councils, and too much reliance is placed on ?traditional? research providers. Robert Arthur also believes that the UK science base has much to offer, not least through its networks and collaborative relationships established with developing countries over a long period. Stephen James considers that there is an excessive bureaucratic burden in accessing DFID funding, exacerbated by the log-frame system and excessive monitoring. The process needs to be simplified and made more transparent. This is contrasted with funding arrangements of the Foundations, such as Rockefeller.

7. Hubert De Bon notes that many examples have been given in the E-forum of work involving UK and developing country institutions, CGIAR, USAID, IDRC and others, but is concerned that there has been very little participation by, or mention of, other European institutions involved in S&T for development. He accepts that there are collaborative activities supported by DFID, which involve co-funded partnerships between institutions in other European countries, but believes that large projects with EC co-funding should be developed; these would, among many benefits, provide opportunities for younger scientists to enter the development field to replace those retiring.

8. In several earlier postings, Will Masters has proposed a novel approach for soliciting innovations, complementary to other methods, that is based on providing prizes as incentives to innovators for successful pro-poor products or services. The innovators can include anyone, from small farmer cooperatives or small enterprises to scientists in large institutions. The size of the prizes is linked to the economic and welfare gains resulting from the innovation. He draws parallels with the ?pull? mechanisms for developing research products that DFID has reviewed in its scoping work on private-public partnerships.

D. HOW CAN DFID BEST USE AST IN ITS DEVELOPMENT PROGRAMMES, AND DOES IT NEED IN-HOUSE CAPACITY TO DO THIS?

9. Robert Arthur reiterates the importance of the research-development-application continuum, based on experiences with RNRRS programmes on fisheries management. The linkages between research and development that are established are largely due to the initiative of the researchers ?in the absence of a mechanism for doing so within DFID Robert considers that there is still excessive separation of research and development within DFID.

10. A number of contributors pointed out that a very effective way of integrating research with development and uptake is through participatory research involving all key stakeholders from the outset. Examples are provided by Richard Gibson on crop improvement and Robert Arthur in fisheries management. Each partner in the participatory crop improvement programme contributes complementary skills: research from the national scientists with support from counterparts from the

?North? and extension agents, NGOs, farmer groups and others for the development/application components ? but all are working together. Similar activities in the fisheries projects described by Robert Arthur are undertaken through the adaptive learning system, although in his example the end users are not fishermen but the fisheries managers. Both contributors feel that participatory approaches deserve support from DFID.

#### E. WHAT ROLE SHOULD DFID PLAY IN CAPACITY BUILDING AND INSTITUTIONAL STRENGTHENING?

11. Other than the capacity building that occurs through participatory research, just noted, several contributors, including Hubert De Bon and Vinay Chand, reiterate the importance of enhancing scientific capacity in developing countries, and achieving this by integrating research and development. Vinay suggests the use of institutional twinning arrangements to develop capacity while tackling common problems, which may include ?South-South? or ?South-North? partnerships.

#### CONCLUSION

12. By the time you get to read this penultimate summary of the past week's contributions, plus a few others carried over from earlier postings, the E-forum will be in to its last day. If you have any further views on the big issues that DFID needs to address, please do let us know ?there is still a full day to go!!.

Many thanks again to all of you for participating in the Forum, and for providing some many thoughtful contributions. I trust that we can justice to these in our final summaries..

Best regards

George Rothschild

#### \*\*\*\* POSTSCRIPT: PART B: CONTRIBUTIONS ON THE DISSEMINATION OF AST KNOWLEDGE DISSEMINATION AND APPLICATION

I shall shortly be sending the penultimate summary of contributions on knowledge dissemination and application that were transferred from the 'Growth and Poverty' theme earlier. They have not yet been categorised to go under any of the headings framed as questions for DFID. The separation between extension and research in this summary is done solely for presentational reasons.

## **Overall Summary prepared by George Rothschild 3 June 2004**

### A. Agricultural science and technology (AST) issues and research

#### Preamble

1. In the moderator's introductory brief for the Science and Technology theme, the assumption was made that the importance of S&T for agricultural development was universally recognised, as was the role of agriculture as the engine for overall economic growth including industrialisation. On the basis of this, the suggestion was made for participants in the E-forum to focus on such issues as how DFID should access and use knowledge on agricultural science and technology (AST) in its mainstream development programmes, and whether it supported the generation of new knowledge, and related issues - in other words, to emphasise the 'how', 'which' and 'who', rather than 'What'.

2. While participants responded to the issues suggested, many also felt that it was essential to re-state the importance of 'What', and provided their views on the role of agriculture in development, as well as general and specific ideas on priorities that needed to be addressed. As anticipated, there has been considerable overlap between themes in the E-forum on these more generic issues, reflecting the extent of their interdependence. Agriculture in terms of this Forum has been broadly defined to include crops, livestock, forestry, fisheries, and natural resources management.

3. In the summary that follows, the sections are grouped into topics that contributors felt that DFID needed to consider in developing its AST agenda.

#### Priorities for AST that DFID needs to consider

4. Several contributors considered that the world food situation, in the face of continued population growth from 6 billion to 9 billion people over the coming decades, had received insufficient attention from donor agencies, and was in their view the most significant overarching problem. There were varying opinions on whether priorities for AST should be demand-led or supply driven, and the emerging consensus was that these were complementary to one another, with the former having greater relevance to local or national problems, and that latter to those of regional or global significance.

5. A number of contributors stressed the need to put AST into a broader developmental context, considering other sectors and in particular highlighted the interdependence of agriculture and health. It was felt that DFID had failed to do this adequately, and concerns were expressed by one contributor that this was again reflected in DFID's new draft research framework for 2005-7. The need for multidisciplinary approaches to AST was emphasised by many contributors, given the complexities of the livelihoods of the poor in terms of their on-farm and off-farm activities, markets, trade, as well as more basic issues of health and education and so on. This highlighted the importance of building a strong socio-economic component into all AST programmes and projects. Modelling was seen as a useful tool to help identify the contributions that different factors make to the complex livelihoods of the poor, and the merits or otherwise of particular technology or policy interventions. Having said this, it was considered important that the limitations of modelling were also pointed out to those using the outcomes ? who were seen as intermediaries rather than the poor end-users.

6. A number of contributors addressed the issues of AST and the needs of the urban and rural poor. They expressed concerns at the separation of the two, pointing out that there was a rural-urban continuum in terms of agricultural activities, and that research and development needed to reflect this.

7. Many contributors commented on the relative priority that ought to be accorded to smallholder versus commercial-scale farming. The majority felt that the emphasis needed to be on the former, if DFID was indeed focussing on the poor, while some others believed that the two were complementary with the level of investment in each to be determined on a country-by-country basis. In both cases, contributors stressed the need to consider all pro-poor AST in terms of the value-chain from the farm to the consumer. There was considerable emphasis on food staples for food security, but the importance of income generation from cash crops, as well as on-farm value adding to produce, was also stressed if farmers were to make the transition out of extreme poverty. The need for AST on 'orphan' crops not included in the mandates of the CGIAR centres was emphasised by several contributors. One participant pointed out the scope for making tropical commodities more competitive internationally by improving quality and other desired traits through new technologies, and suggested that DFID could launch such an initiative by supporting some pilot examples.

8. The increasing significance of livestock in the developing world through changing consumption patterns was highlighted by some contributors. Livestock represented significant assets for the very poor, and it was felt that far greater attention needed to be given to AST that addressed the complex needs of pastoralists in Africa.

9. While AST to increase production of crops, especially of food staples, was accorded high priority by many contributors, a number pointed out the need to emphasis human productivity. This social dimension assumes special importance for the very poor, as their own labour is a major asset, and also brings gender issues to the forefront. In this regard, one contributor pointed out the importance of bridging the yield gap between the best producers and others through appropriate technologies that reflected best practice

10. Several contributors felt that water resources management had been inadequately addressed in terms of the AST agenda, and that this needed to be considered in a multi-sectoral context that also included water and health, water and domestic/industrial use and so on. Broader issues of environmental sustainability were raised by one contributor, who pointed out that DFID and its predecessors had in the past made a major commitment to sustainable land-use assessments in many developing countries, and urged that this be restored as a significant component of its programmes of AST and development. The issue of sustainability was raised by several other contributors in terms of the respective strengths and weaknesses of low external input agriculture (LEIA) and high external input agriculture (HEIA), and it was pointed that both had costs associated with them. LEIA incurred costs through its requirements for greater land area and labour inputs, while HEIA was subject to the costs of external inputs such as fertilisers and pesticides.

11. The issue of land use in terms of conservation of biodiversity versus its use for food/cash crop production by the poor provoked strong comments from one contributor, who felt that the 'North' had dominated the global agenda and driven it towards conservation rather than utilisation, and that there was no scientific evidence to indicate that the latter, including monoculture was unsustainable if this was linked to good practices.

12. The role of biotechnology in pro-poor AST was noted by several contributors, who felt that this had considerable potential, including for example the introduction into major food staples crops of traits such as drought tolerance, essential nutrients and disease/pest resistance. Some NGO contributors expressed their concerns about the use of GMOs with particular reference to the adverse impact on poor farmers of large corporations marketing these products. A number of participants, including those associated with DFID's Renewable Natural Resources Research Strategy (RNRRS) programmes pointed out that most of the biotechnology research of relevance to the poor was being undertaken in public institutions and as such represented international public goods

13. It was emphasised by many contributors that almost all pro-poor AST is of necessity long-term, given the complexities of the poor referred to earlier. This means 'long-haul' work rather than 'quick fixes' through magic bullets, and this is an issue that is referred to again later in this summary.

How should DFID source its AST knowledge?

14. Contributors considered that DFID should derive its AST knowledge from a wide variety of sources, including public sector organisations in the UK and elsewhere in Europe, as well as other developed and developing countries, international organisations such as the CGIAR, FAO and IAEA, other donor agencies, NGOs involved with AST, and the private sector. It was pointed out that by some contributors that DFID already has access to much AST knowledge through its outsourced RNRRS programmes that have extensive networks with national, regional and international institutions and agencies. One contributor also noted that DFID could directly commission its RNRRS or other programmes to undertake activities that addressed specific issues.

Should DFID support the generation of new AST knowledge, and, if so, how?

15. A number of contributors expressed their concerns that donor agencies, including some parts of DFID, believed that it was not necessary to generate new AST as there was sufficient 'on the shelf' to meet most foreseeable needs, and that the focus should therefore be on applying what was already known. There was broad consensus that, given the many changing and emerging challenges facing the poor, there continued to be a compelling need to maintain programmes of strategic and applied AST. There were also concerns that DFID emphasised the need to achieve rapid impact through, for example, 'magic bullet' projects, and therefore tended to support short-term rather than long-term programmes needed to effectively address the problems of the poor. The key question raised was what areas should DFID support and by what mechanisms?

16. Effective partnerships were seen as an essential ingredient of any mechanism, with complete equity between partners in terms of sharing research and other outcomes. In this regard, it was felt that the outsourced RNRRS programme model had significant strengths, but also some weaknesses, which included a lack of communication/collaboration between programmes - given the interdisciplinary nature of the problems faced by the poor. A number of contributors pointed out that there were also inadequate linkages between DFID and UK institutions supported by the Research Councils. It was recognised that the main emphasis of these institutions was on issues of benefit to the UK, but that they had also had much to offer the developing world

17. Contributors had mixed views on the significant increase in support for the CGIAR centres, pointing out that (a) they were dependent on partnerships with other institutions, (b) many were experiencing problems in leadership and broader governance issues, (c) they were costly in terms of overheads, and (d) that their mandates were restricted to food crops rather than cash commodities. While valuable work was being undertaken at centres, it was felt that allocation of funding to the CGIAR should be based on rigorous prior evaluation of the programmes being supported. One contributor pointed out the importance of coordination and collaboration with other European institutions engaged in generating new AST, and the significant scope for DFID to engage with the EC and member state donor agencies to support large activities through co-funding.

18. Another contributor raised the possibility of soliciting new AST innovations through the award of prizes from any individual, groups or agencies, public or private, in developing or developed nations. This 'pull' mechanism for acquiring new AST could complement other approaches already in use.

How can DFID best use AST in its development programmes and does it need in-house capacity to do this?

19. There was a wide consensus among contributors that research on AST should be fully integrated from the outset with mainstream development programmes, if the outcomes are to reach the poor. This was described as the research-development-application continuum. Most donor agencies had failed to achieve effective integration, and there was an opportunity for DFID to provide leadership by introducing such systems into central and in-country programmes. A number of contributors noted that some RNRRS programmes had, in the absence of a formal mechanism, set up their own systems for further development and application of research outcomes. These were inevitably short-term and thus not always sustainable after projects terminated, with frequent losses of key staff in partner countries, the UK and elsewhere.

20. At least one contributor pointed out that this was always likely to be a problem of a project-based approach to development in the absence of a longer-term strategy. Having said this, several other contributors believed that DFID's RNRRS programmes with a life of 10 years did have a coherent long-term strategy, and that this model should, as noted earlier, receive serious consideration by DFID in establishing its new strategy for AST. In doing so, one contributor emphasised the need to assess the impact of the programmes and thereby gain from lessons learned. This meant placing as much, if not more emphasis on failed projects than on successful ones.

21. Several contributors believed that it was important for DFID to have in-house capacity to address technical issues in its central and in-country offices, and highlighted the adverse effects of erosion of such capacity over recent years - particular at the senior levels. One contributor felt that, whilst in-house capacity was desirable, this was not essential and could be outsourced.

22. Issues of storing and accessing AST information as well as the dissemination of research outcomes are addressed in a later section of the summary.

What role should DFID play in capacity building and institutional strengthening?

23. There was broad consensus among contributors on the crucial importance of both capacity building and institutional strengthening as an integral part of AST, and the need for DFID to develop a strategy for supporting this effectively. Without this, there was little or no likelihood of AST being sustained after donor-supported partnerships came to an end. A number of examples were provided from RNRRS programmes where effective partnerships had led to national institutions forming their own networks and other alliances. The particular problems of weak African national research and extension systems were flagged by many contributors. It was recognised that very significant multi-donor funding was needed to address these problems, combined with the necessary political will of the national governments. This should however not deter DFID from continuing to support and indeed enhancing its commitment to capacity building and institutional strengthening.

24. Participatory research initiatives involving all key stakeholders, farmers, NGOs, extension agencies and social and life scientists, were highlighted by many contributors as being of special significance in terms of capacity building, and worthy of support from DFID. The need for capacity building for local agricultural innovation systems was stressed by one contributor and supported by others. These encourage active participation of all stakeholders through knowledge sharing and learning, and could provide opportunities for DFID to fund in-country AST initiatives that address priority needs in mainstream rural development activities. It is suggested that sources of AST for such activities should include the UK science base.

25. A number of participants expressed their concerns about the continuing decline in funding for training young scientists from developing countries, noting the success of earlier schemes and the legacy that still remained from these. These concerns were not confined to the developing world, but also to the UK. There had been very significant losses of scientists with specific experience of pro-poor development in recent years, and thus little or no incentives for younger scientists to seek career opportunities in this field. It was considered that further attrition would seriously impact on the ability of the UK to retain its position as an internationally-recognised leader in AST for international development. The contributors urged DFID to establish schemes to help recruit young scientists into the development field as has been done by several other donor agencies.

What are the implications for AST of DFID's move towards direct budget support (DBS)?

26. Only one contribution referring to DBS was received in the S&T theme, but the topic was discussed extensively in a number of other themes. The contributor to S&T cited one example in Ghana where effective local capacity building led to those trained in AST to successfully lobby for AST to be built into the poverty reduction strategy paper (PRSP), and subsequently receive support for several specific activities.

B. Agricultural science and technology: Dissemination of AST knowledge and uptake

Access to AST knowledge

27. In a series of contributions on 'mediated communication', one participant highlighted the crucial importance of advances in information technology (IT) for

archiving and accessing AST knowledge - a view supported by a number of other contributors. The intended audience here is national research and extension organisations, NGOs and other 'intermediate' stakeholders, rather than poor farmers, but one contributor pointed out that the establishment of village information centres in some areas are enabling rural communities to access such information directly. The previous contributor noted that a range of IT methods can be used to provide wider access to publications, reports and leaflets produced by research institutions, extension services and donor agencies, where hard copy distribution would inevitably reach a far more limited proportion of the intended audience.

28. Most international research organisations have websites, but CD-ROM digital libraries can provide a vast amount of information in situations where there is no Internet access but a computer is available. The CGIAR is providing a considerable amount of AST knowledge in this way, and a number of DFID's RNRRS programmes are making project information available through CD-ROMs. suggested that DFID should require all of its projects and programmes on AST and extension information to archive their material electronically.

29. The same contributor also highlights the need for the outcomes of AST research to be popularised so that they can be accessed and understood by farmers, and others in the rural communities including school children. Few national research and extension organisations in the developing world provide incentives for scientists or others to take on this task. DFID should develop a formal communications strategy that includes AST. Such a strategy should include capacity building in communication channels such as the mass media.

30. A number of contributors representing organisations that use electronic communication channels for sharing information between stakeholders also pointed that these channels are augmented by hard copy newsletters for those unable to access computers. DFID has funded a number of activities in this area. A plea was made by several contributors for DFID to provide assistance to libraries in the developing world, many of which are in a woeful state.

#### Extension services

31. Contributions on extension services have appeared in several themes in this E-forum, and this summary is based on those that were forwarded to the S&T theme.

32. The main message emerging on this topic was a need for extension agents to be able to advise on a wide range of challenges that faced poor producers, going beyond production through the entire value chain. These included information on new technologies for intensification and diversification of production, prospects for on-farm value adding, prices, markets and so on. Gaining experience in these areas would enhance the value that farmers place on their extension agents, and thus motivate the latter. It was claimed that most currently lack motivation. The extended mandate of extension agents would also provide opportunities for participatory planning for small farmers, addressing, for example, key issues in the annual cycle of farm activities and how these relate to off-farm employment opportunities. In developing such plans, extension agents could work with district teams comprising farmer associations, NGOs, private sector representatives and other stakeholders. It was recommended that DFID support a number of pilot schemes to evaluate these programmes.

33. Several contributors considered that some aspects of the extension service function could be contracted out to the private sector where this was considered appropriate. This was already happening in the case of crops such as cotton, which are linked to specific market demands. Contract farming that involved small farmers was cited as a further means of building up the know-how and skills of farmers in applying new technologies.

Concluding summary of points raised in the AST summary for consideration by DFID

- (i) Need to ensure that AST is developed within a developmental context
- (ii) Issues that need highlighting as priorities include:  
(Note\*\* very few contributions were received on forestry or fisheries, so these priorities are not representative of the whole RNR sector)
  - The potential world food crisis
  - The linking of agriculture and health
  - Water resources management
  - Sustainable land use
  - Livestock, including pastoralism
  - Piloting of programmes to increase competitiveness of tropical crops internationally
  - Consideration of entire value chain in smallholder agriculture for food and cash crops;
  - Ensure balance in AST investment for smallholder and commercial scale agriculture
  - Tackle long-term challenges faced by the poor, and not only those addressed through short-term rapid impact projects (e.g. 'magic bullets')
- (iii) Need to support the generation of new AST to address emerging problems of the poor, as can not rely on what is 'on the shelf'
- (iv) In developing new research strategy, review strengths and weaknesses of different models including the RNRRS
- (v) Develop more effective linkages with the UK science base, and greater linkages with other donors and institutions in Europe
- (vi) With increased support for CGIAR, ensure that there is rigorous evaluation of programmes and impact, as for RNRRS and bilateral activities, before allocating funding. Ensure that increased funding not at expense of bilateral programmes
- (vii) Ensure that reviews of impact of RNRRS and other programmes to learn lessons, include failures as well as successes
- (viii) Consider 'pull' mechanisms, including prizes, for encouraging innovation in pro-poor innovation for AST
- (ix) Need to integrate research and development so as to create a research-development-application continuum both centrally and in country programmes
- (x) Get adequate in-house capacity for AST
- (xi) Need to develop a strategy for effectively supporting capacity building and institutional strengthening for AST
- (xii) Continue to support strengthening of national research and extension systems (NARES) through co-funding
- (xiii) Support local innovation systems to feed into in-country programmes and address high priority needs in mainstream development
- (xiv) Help ensure that there is no further erosion in numbers of development scientists in developing countries and the UK, through appropriate fellowships and other training schemes
- (xv) Develop a communications strategy that includes AST, and, under this, support capacity building in communications in NARES, and also the production of CD-ROM digital libraries and similar electronic sources of information

- (xvi) Ensure that all DFID programme and project outcomes on AST are electronically archived in readily accessible form.
- (xvii) Support innovative approaches to enhancing extension services, including training to broaden the skills of extension workers.