CHINA: DEVELOPMENT RESEARCH PRIORITIES

REPORT ON CONSULTATIONS FOR DFID'S GLOBAL RESEARCH STRATEGY 2008-2013

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PART 1: SYNTHESIS REPORT

Summary: Main Conclusions of Research Consultations in China

1. Chinese researchers recognised the significance of DFID'S role in development research in China, noting
    - the value of the type of research supported with its emphasis on cross-sectoral and multi-disciplinary approaches and the fostering of evidence-based policy research;
    - the added-value in terms of a focus on poverty reduction and support for policy linkages and impact.
2. CRD research themes resonate with current development priorities within China, as well as reflecting areas where the nature of China's domestic development will be critical for creating global public goods and reducing poverty.
3. Engaging China in research on global development issues is imperative if progress is to be maintained in reducing poverty and promoting sustainable development, for a number of reasons:
    - China is an important strategic partner due to its growing impacts and multiple forms of influence on the rest of world, and the scale of its contribution to the global commons;
    - China's actions in areas such as health, technology development, and energy use, as well as its consumption, trade and investment patterns, will significantly affect growth and poverty reduction in other developing countries;
    - China has numerous lessons and experiences that are valuable to other developing economies, although identifying and communicating appropriate lessons remains a challenge;
    - China will be a growing source of ideas and innovation in basic science (for climate change, health and agriculture), low cost alternative technologies, institutional arrangements, and other areas which can contribute to growth and poverty reduction globally.
    - A failure to engage constructively with China on these critical development research issues risks compromising or undermining development efforts and the achievement of the MDGs.
4. As China becomes a significant global actor, engaging with its researchers in collaborative research efforts will in itself constitute a global public good, in so far as it enhances the quality of China's engagement in the international development community.
5. In terms of research gaps and priorities, in addition to the recommendations of each Consultation report, a number of general needs were identified, including:
    - basic scientific research, but with an emphasis on the linkages with social science and policy research;
    - multi disciplinary and cross-sectoral approaches and methodologies;
    - a stronger understanding and analysis of institutional issues, policy processes and channels for translating research into practice;
    - methodologies for monitoring and evaluating current experiences e.g. from the implementation of pilot or reform programs, as well as learning from recent experiences.

6. To maximise policy impact, promoting Chinese collaboration in international research programs needs to be based on:
    - the identification of research priorities that are responsive to demand, informed by shared interests and undertaken from an understanding of China's interests and incentives for engagement
    - research topics that are framed in ways that are sensitive to political and policy priorities in order to ensure policy support and impact.
7. Building effective partnerships for collaborative research requires investments of resources and time, but can be supported through:
    - provision of information about existing partnerships or collaborative arrangements in different fields
    - a longer lead time for proposals, and preparatory grants or other support to build partnerships and develop joint proposals
    - development of resources, information packs, guidance in research proposals, etc. to support Chinese researchers to submit proposals in collaboration with international institutions.

    These efforts can be enhanced through
    - engaging other institutions to assist in the provision of information, capacity building and proposal development
    - China's inclusion or representation on the governance bodies of large research programs (such as DFID's)
8. To fill knowledge gaps on the context and constraints for global partnerships for development, short studies could be commissioned, for example on:
    - experiences and barriers to partnerships or participation of Chinese researchers in global networks or international collaborative programmes;
    - research-policy linkages in the Chinese context for example through meta-analyses or case studies of policy processes;
    - available resources and information gaps for communicating and sharing development related research.
9. Some general considerations for cooperation which emerged included:
    - *Prioritisation* of research themes will help to ensure effective impact;
    - China provides a unique environment for *demonstrating* the impacts of reforms, new technologies and innovations;
    - *Integration* between research themes, sectors and disciplinary approaches needs to be supported;
    - *Cooperation* should be fostered internationally and between different actors;
    - Mechanisms are needed to support *policy-oriented research* with results channelled to policy makers;
    - *Communication and dissemination* channels, both up to policy makers, and down to the users and those affected, can be better utilised;
    - *A range of stakeholders* and institutions can assist in supporting global research partnerships, including Research Councils, other funding bodies and academic institutions.

1. Introduction

A series of three consultations were organised jointly by IDS and DFID-China as part of DFID's global consultations. The China consultations focused on three of the identified priority themes: Agriculture, Health (the challenge of infectious diseases), and Climate Change. Each consultation was facilitated by DFID-China staff and an expert in the relevant field who was responsible for writing a summary report from each meeting. The summary reports and recommendations arising from each consultation form the second part of this document.

The objectives of the meetings from the perspective of CRD and DFID-China were to gain insights from the Chinese research community on a) what the development research priorities should be; and b) how researchers in China, as an emerging global player, could be better connected with the international development research community. Each consultation raised core questions concerning:

- domestic research priorities and needs in the relevant fields;
- the potential global relevance or impact of research undertaken in and on China in these fields;
- the engagement of Chinese institutions and researchers in international collaborative research efforts.

Each consultation brought together approximately 25-30 distinguished Chinese researchers and a small number of policy makers and international scholars in the respective areas.[1] (A full list of participants is provided in Appendix 1). While each consultation included a broad range of perspectives and disciplinary approaches, the discussions reflect some biases and gaps arising from the selection of individuals and institutions who participated: the Health consultation focused strongly on health systems and social science perspectives, with limited attention to basic science or technology development; the climate change discussions had a stronger focus on science research. This synthesis draws on other sources of information to point out some of these potential biases and gaps.

In terms of the engagement with a global research agenda, the focus of each conversation varied, due both to the nature of the topic and the experience of those present. While climate change researchers are naturally focused on a set of issues which engage directly with the global community, in the case of health the key concern tends to be resolving the domestic challenges of China's health system reforms, and then drawing lessons from these that could assist other countries. In the case of agriculture, emphasis was placed on the relevance of and potential lessons from China's experiences particularly in relation to Africa.

In addition to the focus on research content and priorities (summarised in the separate reports), discussions highlighted the inputs needed to improve research, including access to information, expertise, knowledge networks, and resources for building collaborative partnerships. There was limited sharing of experiences of working in international partnerships, but some suggestions did emerge for improved mechanisms or support that might allow Chinese researchers to participate more effectively in global networks.

[1] In addition to DFID-China staff, the Health and Climate Change consultations were attended by Valerie Flemming (consultant for the CRD Global Consultations), while Anna Ballance from CRD made a valuable contribution to the Climate Change meeting by providing additional information on CRD's research strategy.

This report also draws on additional insights gained from a complementary roundtable on development research and partnerships in China organised by IDS. (See Appendix 2). This event brought together a number of research partners from a wider range of fields than those covered in the DFID consultations; it focused on the capacity of the Chinese 'development' research community to document and share China's development experiences as well as to absorb what the global community has to offer. It thus provides some additional perspectives, as well as reinforcing many of the cross-cutting themes that emerge from the consultations.

This synthesis report highlights the major themes running through the consultations. The following sections focus on:

- The context for development research in China,
- Research themes – gaps, needs and priorities, and
- The challenges to engaging China in global development research.

A final section draws out some general conclusions and implications.

2. Context: Development Research in China

The rationale for research on China

Over 20 years of rapid and sustained economic growth and poverty reduction has put China on the threshold of becoming a major influence on thinking, policy and practice in international development. China has many development success stories to share with the rest of the world—donors and recipient countries alike, while its emerging power is allowing it to expand its engagements in development cooperation. There is an appetite in many parts of the world for 'learning from China', and an increasing recognition within China of the need to find ways to reflect on, document and share China's experience. At the same time, there is awareness among many Chinese scholars and policy-makers of the on-going difficulties of balancing growth with lasting poverty reduction and a more sustainable and equitable development path. By extension, the complexities of identifying and sharing 'lessons' arising within China's relatively unique institutional and transitional context are also recognised.

The background of unprecedented economic and structural transformations, rapid population mobility, urbanisation, demographic and epidemiological transitions, make the research themes identified by DFID clearly relevant to China's domestic development needs and priorities. More importantly for CRD, addressing these priority themes within the Chinese context has important implications for a global poverty reduction agenda. Feeding and fuelling an increasingly affluent population with changing consumption patterns has widespread ramifications; the emergence and spread of disease, facilitated through increased population mobility, and the close links between health and the environment, including the relationship between humans and animals, are issues of global concern, with impacts that are likely to affect poor countries and populations most adversely. Research on and about these issues within China thus remains critical for understanding and addressing global needs and vulnerabilities in areas such as health, food security and the environment.

Scale of response: China's contribution to the global commons

As a rapidly developing country with a significant proportion of the world's population, China's impact on global public goods places a particular importance on translation of research into practice in the country itself. This is particularly true for climate change research. Even if research outputs are only focused in China itself, such as the widespread adoption of less carbon intensive production and power generation systems, the resulting shift in behaviour will have global benefits through mitigation of

greenhouse gas emissions and human-induced climate change. Similarly, agricultural technology that enables improved efficiency of water use has potential benefits for trans-boundary water users outside China.

China's research institutions and companies are playing an increasing role as producers of research and development-based technologies. For example, its pharmaceutical industry is eager to bring active ingredients in traditional Chinese medicine to global markets and to invest in the development of new products. They can play a significant role in the global efforts to find new ways to respond to the challenges of killer diseases.

China as a 'development' actor

A further rationale for engagement with China over a development research agenda is China's emergence as an important global actor. China's impacts will inevitably be hugely significant in low income countries – whether through trade, investment or development assistance. While there are many good researchers working on development related issues in China, there is no clear 'development research community' or defined field of study. The expertise and networks required to assist in developing mutual understanding, shared learning and knowledge transfer between countries are weak. There is an important role to be played in fostering dialogue and collaborative forms of engagement which can strengthen China's reflection on and engagement with global development issues. A strong research programme could contribute to building a community that is more closely engaged with international development debates and actors, participates in collaborative programmes, and engages with the problems of other countries to find solutions through mutual research and action.

3. Research Themes: Gaps, Needs and Priorities

Research gaps and needs

Each consultation highlighted a range of basic research needs and evidence or knowledge gaps in their own fields. The specific areas are summarised in the attached reports (Part 2). They range over a number of general issues or areas which include:

- basic scientific research e.g. on climate change modelling
- social science research e.g. on vulnerability and impacts
- institutional and policy research
- the identification of lessons that can be shared
- research on innovation and technological development and transfer
- methodologies for research design, such as long term analysis, monitoring and 'quasi-experimental' design
- a better understanding of how research generated knowledge can inform policy and practice.

In terms of DFID priority goals of global poverty reduction, China has much valuable experience to share. Examples include experiences in agricultural and rural development and migration, and its disaster and risk management system. At the same time, a poverty reduction agenda must involve a focus on 'public goods' (or 'bads') – the potential positive or negative externalities of China's rapid growth and transformation in areas such as health and environment, as well as the implications of changing terms of trade and demand for goods and services (with related price effects). A more systematic understanding and analysis of the positive aspects of China's experience, as well as the limitations and potential relevance to other

environments, is required if lessons are to be useful either for domestic or international audiences.

What and how can we learn from China?
Most consultations addressed the issue of 'learning from China'. This involves questions of *what* can be learnt and whether there are lessons to share; and *how* to identify and share relevant experiences. The agriculture consultation most explicitly discussed the question: *Is there a Chinese development model*? The model of policy experimentation, and the relationship between research and experimentation or practice, that has shaped many of China's reform processes, was viewed as sufficiently distinctive to warrant deeper analysis if transferable lessons are to be drawn. In addition, findings need to be communicated more effectively – between researchers and policy-makers, within China and externally.

A number of participants cautioned about the focus on China's successes and demand from outside observers for 'lessons': while the success stories are apparent, it is also important to understand the failures, the unsolved problems as well as problems generated by success. This caution calls for a stronger focus not just on the observed outcomes, but on the institutional arrangements and policy processes which underpin them.

Institutions and policy processes
Underpinning China's development successes and shortcomings are a set of institutional arrangements that are also evolving and that require a deeper understanding. These were discussed in two ways:

First, some specific examples illustrated the institutional factors contributing to successful interventions. The way in which, during the early reform period, China's agricultural extension system supported getting information to farmers, and research was directed towards practical benefits and could be transferred through this system, was seen as a key contribution to early development successes – one which however has now been undermined by changing incentives and institutional arrangements. The extension system is now less effective, research is less closely linked to practical demands, and research findings are no longer well communicated to farmers, and particularly to the poor.

A second illustration concerned how policy influence occurs, and how research and knowledge are disseminated to have impact on practice. As with the extension system, some kinds of successes can be achieved through vertical administrative systems (for example, within the health system) where policy directives and implementation operate in a top-down directive manner. However, limitations are apparent where more horizontal integration is needed (between vertical channels), for example to achieve better health equity and poverty reduction outcomes at the local level.

Towards Sustainable Development
A thread running through the consultations concerned the close links among the priority theme areas - health, climate change and agriculture – as core aspects of a sustainable development strategy. The obvious links and synergies were raised in all discussions, as was the need within China to adopt more integrated, multi-disciplinary approaches to studying the problems, and to identifying potential responses and possible impacts (particularly on the poor or vulnerable) of adaptation or mitigation interventions. The importance of more social science and people-centred approaches was highlighted. For example, in terms of the relationship between environment and health, environmental challenges are not only about hi-

tech science; there also needs to be a focus on the delivery of low tech solutions that can address the needs of the poor, such as how to assess or test for water safety and pollution hazards.

A more macro perspective on issues of sustainable development pointed to the need to place China's growth and development successes in a global context in order to assess the costs and benefits. China's manufacturing-led growth is inevitably accompanied by environmental stresses which also impact on peoples' health. The economic acceptability of China's model may not translate into environmental acceptability or create the desired human development outcomes over the longer term. At the same time, just as China has absorbed some of the 'costs' of development (e.g. pollution and emissions associated with its rapid rise as a global factory) as it develops, these may in turn at some stage be 'exported' to lower income, more vulnerable locations. The costs and benefits, trade-offs over time, and impacts on different groups, need to be better understood and assessed as part of a global research strategy.

China as 'quasi-experiment'

China's reforms were described as a 'quasi-experiment': given the scale, internal diversity, and rapidity of rolling out new pilot schemes, it offers huge potential to assess the impacts of different policy choices. Currently, however, the design of interventions and associated research and data collection efforts provide limited scope for a rigorous monitoring of impact. Health systems reforms and medical payment models that reach the poor is one area that could be more effectively studied and lessons drawn. The inclusion of a large proportion of the population in insurance schemes that collect systematic administrative information, for example, provides important opportunities to conduct large-scale trials of new treatments or interventions, as part of multi-country consortia. Similarly, China could serve as a 'laboratory' for research on adaptation to climate change or the uptake of renewable energy, with its unbalanced rural-urban and regional development, potentially providing a demonstration effect for other developing countries. Such studies would require long term investments, with longitudinal or quasi-experimental studies, but would potentially generate important lessons for other environments.

Research approaches and methods

Discussions pointed to the close relationship between research gaps and priorities (*what* to research) and questions of methodology, capacity and approach (*how*), as well as on how research can have impact. The need within China for better integration of basic science and social science research, as well as cross-sectoral and multi-disciplinary approaches, emerged as a key issue. All the areas discussed involve research across the science and social science spectrum. The separation between the two was at times apparent: scientific investigation was described as the research component, while the impacts on people, rather than requiring social science approaches, were regarded as being about policy and implementation.

4. Engaging China in Global Research for Development

There was both interest and demand for engagement in global research efforts, but significant barriers to such engagement were identified. Design of a new research effort needs to consider how Chinese researchers can expand their focus from domestic or local issues to the global; and how to strengthen the contribution of Chinese researchers to global research efforts.

Two key issues arise in this context:

1. China clearly needs to be part of the global research community to achieve international development objectives. Currently, however there are significant obstacles to engagement. What are the capacities, 'soft infrastructure' and other investments needed to overcome these barriers? How can DFID or other actors play a role?
2. What are the interests and incentives of Chinese researchers to engage more fully in global development research agendas? What are their research priorities, and how can these be aligned with the international community? What support is needed to ensure productive partnerships?

China's engagement in research partnerships: Issues and incentives

Choices about research areas and approaches need to be informed by demand and shared interests. Chinese researchers naturally focus on issues directly relevant to China's development priorities. In areas where the demand by Chinese policy makers, funding agencies or researchers is not explicit, the interests and incentives for Chinese researchers to engage in global research need to be identified. For Chinese researchers, funding alone may not be a sufficient driver; and in particular would not necessarily generate participation of the best researchers or lead to quality partnerships. Incentives for Chinese researchers to collaborate are more likely to come from the knowledge and expertise they acquire, that will help them to solve domestic problems (examples might be addressing diseases such as TB or engaging in technology development).

It may also be important to frame research issues in a way which resonates with Chinese policy debates and priorities. Different research areas, particularly in a global or comparative context, can arouse political sensitivities. Data and information sharing can be sensitive, with access to data often restricted. Political support, and thus the potential for policy influence, is more likely to be achieved where issues are in line with government research priorities. At the same time, a strong demand exists for new methodologies and exposure to alternative approaches which can facilitate collaboration while strengthening China's own research capacities.

It was also noted that China's own efforts to engage with other developing countries (in development assistance, technology transfer, etc.) are largely 'supply' driven. Understanding the 'demand' from other countries – whether for lessons, experiences, technologies, for example – should enhance the effectiveness of China's own development efforts.

Modalities: Building research and learning networks

While a number of Chinese scholars and institutions are part of global networks, and in some cases lead global research programs, this remains the exception. Few Chinese institutions are engaged in the major research programmes or centres supported by DFID. The consultations provided few concrete examples of how successful partnerships worked. However, many researchers discussed the barriers to effective participation in international partnerships. Issues included obtaining adequate information, the difficulties of identifying appropriate partners, learning about opportunities, in addition to more obvious language issues and limited mutual understanding of respective contexts. Some of these issues are exacerbated in the context of calls for research proposals, with their relatively short lead time for coordinating and building relationships. Chinese partnerships tend to be rooted in personal relationships between individuals which require time to build.

While a strengthening of both bi-lateral (UK-China) and tri- or multi-lateral partnerships was welcomed, there is a need for a better understanding of what determines good quality partnerships. There is limited experience in particular of

collaborating other than with more advanced economies: very little experience exists in middle income, transitional or developing countries. Some researchers suggested closer research collaborations with Japan and the US at least in specific areas, than with the UK. The limited base of mutual understanding and shared knowledge and experiences between China and many low income countries (especially in Africa) was noted. Opportunities for collaborative research, visits, and participation in studies in other countries were welcomed as a way to build these relationships.

The creation of effective partnerships requires investments and time. Suggestions for improving China's global engagement included:

- promoting China's inclusion or representation on the governance bodies of large research programs (including DFID)
- learning about existing partnerships or collaborative arrangements in different fields
- longer lead time for proposals, or preparatory grants to build partnerships and develop joint proposals
- developing resources, information packs, guidance in research proposals, etc. to support Chinese researchers to submit proposals and collaborate with international institutions.

Research strategy for impact

Ensuring that research leads to policy impact, and that knowledge generated is translated into practice, were concerns that resonated throughout the consultations. While pertinent to both domestic and global research projects, the challenges are likely to be magnified in the context of global programmes.

The translation of knowledge into practice was frequently articulated as a weakness of the Chinese system (positive examples included the agricultural extension system). Questions were raised about whether this was a question of better integration between research and policy or of research which crossed disciplines and engaged more directly with policy. It was suggested that a better understanding was needed of how research is embedded in policy processes in China which was seen as very different to many other contexts. The contradiction between the apparent top-down generation of much research, and the weak channels for policy influence, is something that needs to be better understood and can be examined through case studies of policy processes.

Institutional issues are pertinent: research that is undertaken through one vertical system (e.g. agriculture, health) may not readily feed into broader policy debates, or can be blocked from wider dissemination or communication to more senior policy makers. Funders or research partners need to be aware that engaging with particular research institutions will have different implications in terms of the particular channels of policy influence available.

A related issue concerns the communication and dissemination of research findings or information. While the policy channels may assist in knowledge transfer and policy influence through upward communication to policy makers, there is often a lack of communication 'downwards' – to implementers, users, and others who may be affected. Some participants noted that researchers are not necessarily good at communication and dissemination outside conventional channels, and tend to limit their outputs to reports and academic writing. Much greater potential exists for using popular mechanisms including the mass media, TV debates and programs on topics such as climate change, environment and health, to communicate with a wider audience.

Capacity enhancement: Investing in 'soft infrastructure'

The lessons from some of the above discussions point to the need for capacity building and strengthening of the 'soft' infrastructure that would support research partnerships. Beyond participation in networks or programs, a further question is how effectively such institutions could take a leadership of global partnerships and research programs. Some of the issues noted above – limited understanding of contexts among countries; and a concern principally with development issues within their borders rather than on how they affect others – may complicate this leadership role. Nonetheless, there is a need to invest in infrastructure to enable such institutions to play leadership roles in such initiatives. The question of who should be responsible for such investments, and how it should be done, requires further consideration: can it be done through CRD as an embedded part of the research strategy, or does it need more support from other institutions as a prerequisite to expanding roles within global research consortia?

In summary, doing research better on development issues – and particularly to ensure impact across international boundaries – requires that the issues identified and modalities used fulfil some basic conditions:

- research themes are responsive to demand
- research contributes to policy and practice
- communication is improved in the research process
- capacity development is supported, and
- effective partnerships and collaborative research processes are developed.

5 Implications and Recommendations

An on-going role for DFID in development research in China

The consultations for DFID's new research strategy confirmed the significance of the priority research themes. They highlighted the need for DFID research to build on current strengths, including inter-disciplinarity, bridging the social and hard sciences, and focusing on research-policy linkages. Contributions include an emphasis on cross-sectoral and multi-disciplinary approaches and the fostering of evidence-based policy research.

The research themes identified by CRD are relevant to China's own development priorities, and have strong inter-linkages and synergies for promoting sustainable development. The themes also reflect areas where China's impact will be critical to global poverty reduction and development.

Crucially, there is a big opportunity and demand to develop partnerships with China on international development issues: DFID can contribute to the development of research on the intersection between national and international development issues, and provide support to strengthen international research partnerships.

DFID funding brings a clear added-value to research through its focus on poverty reduction and policy impact: this could be enhanced through the development of links with other funders and existing global research partnerships, particularly in the hard science fields. DFID can play a role in assisting the search for alternative funding as DFID China resources are scaled back.

The imperative of engaging China in global research efforts

China's engagement in global development research, and the production of research on China, in itself contributes to the global public good. It will enhance the quality of

China's engagement in the international development community as well as being a source of ideas and innovation for example in basic science (for climate change, health, and agriculture), low cost alternative technologies, institutional arrangements, and other poverty reduction experiences. Failure to engage with China on these core development issues, in areas such as health, agriculture and climate change, where China's size and impact inevitably affects the global commons, will compromise or undermine the development efforts of the international community.

The promotion of research partnerships must be done from an understanding of China's interests and incentives for engagement, while research themes also need to respond to demand and be framed to engage with China's political and policy priorities.

Research issues

A number of issues were identified as important to broader development agenda and could potentially be enhanced through stronger research collaborations. These are summarised in Part 2, but include:

- understanding the impact of China's development on its close neighbours in the Asia region, for example, through water use, demand for bio-fuels, timber and other natural resources and their impacts on neighbouring countries in south east Asia; as well as on the rest of the developing world;
- fostering China's capacity to participate more effectively in global governance institutions and in international negotiations on issues such as climate change;
- engaging Chinese research institutions and R&D-based technology companies in global efforts, for example, to find new approaches to address infectious diseases, alternative energy sources or low carbon technologies;
- understanding the wider distributional impacts of policies, including who pays and who benefits – both within China and across borders.

Research mechanisms

The design of research programs and mechanisms for soliciting proposals needs careful consideration to facilitate China's engagement. Specific suggestions included

- a longer lead time for proposals and support in proposal preparation
- resources for project preparation and partnership building
- provision of relevant information to facilitate building bridges between institutions.

DFID could seek to establish relationships with other stakeholders or research funders, for example, to support information provision, capacity building and proposal development, or to bring together hard science funding with social science and policy research.

What additional information would be useful?

In the short term, some additional information would be valuable as a basis for better understanding of existing research partnerships, and the context and constraints for global partnerships for development. Short studies could focus for example on:

- experiences and barriers to partnerships or participation in global networks;
- obstacles faced by Chinese researchers in international collaborative programmes
- research – policy (or knowledge to practice) linkages in the Chinese context
- a meta-analysis or case studies on institutions and policy processes
- a better understanding of the resources available for communicating and sharing development related research.

General considerations for cooperation

- Prioritisation: many possibilities for research within the theme areas exist. Key research issues in the Chinese context are summarised in the attached reports. Within themes, a strategic selection of priorities will contribute to effective programming and impact.
- Demonstration: China provides an excellent environment for demonstrating the impacts of reforms, new technologies and innovations. This can provide gains internally as well as a wider demonstration effect for other countries.
- Synergies and integration among the priority theme areas, and between science and social science analyses, are needed to ensure effective contributions to poverty reduction.
- Cooperation for research needs to be fostered, and can be at several levels: internationally and within China, across regions, and between different actors or disciplines.
- Policy orientation: Mechanisms need to be found to support research linked to policy initiatives, and with results directed to policy makers.
- Communication and dissemination needs to be strengthened, using multiple channels and media, both up to policy makers, and down to the users and those impacted by information.
- Engaging stakeholders: A number of institutions may have useful roles in supporting and facilitating a program involving global research partnerships, including Research Councils and other funders; academic institutions with strong partnerships with Chinese institutions; and existing networks.

PART 2: CONSULTATIONS ON DFID'S RESEARCH STRATEGY 2008-2013

SUSTAINABLE AGRICULTURE, GROWTH AND POVERTY REDUCTION

19th October, 2007 Friendship Hotel, Beijing

James Keeley, IIED

1. Introduction:

This consultation brought together over twenty distinguished Chinese researchers, as well as a small number of international participants with relevant experience. The Chinese experts came from a range of different backgrounds: agricultural scientists, economists and other social scientists working on agriculture, and researchers working on questions of rural reform and rural development.

The consultation was divided into two parts, with each discussion an hour in length. In the first session participants reflected on key lessons from China's success in relation to agriculture, rural reforms and poverty reduction, concentrating in particular on the role of research.

The second session looked at China's growing global role, and asked:

- to what extent is research on agriculture in Africa being undertaken by Chinese researchers?
- how well are Chinese researchers able to engage with global initiatives?
- and, what is the role of research in sharing lessons between China and Africa to address agriculture and sustainable development issues?

2. Lessons from China

2.1 What are the main lessons from China on the role of research in agriculture and poverty reduction?

The meeting discussed several different aspects of the lessons from China in relation to agriculture, rural reforms and poverty reduction, emphasising the role of research and learning processes.

For the purposes of this summary, research can be thought about in two ways, which correspond to some extent to a social/natural science divide:

1) research that seeks to understand and capture lessons from experience to inform policy choices and decision-making processes – i.e. the function of research is to speed up learning and contribute to good change

2) research that generates technologies or models which are then applied, i.e. research is a powerful source of innovations which contribute to changed economic and social relations

There was some consensus that there is a Chinese model of policy experimentation and learning. Zhang Xiaobo (IFPRI) opened the meeting by presenting conclusions from a series of papers commissioned on this theme.

Participants argued that in China (particularly in the early reform period) research followed experimentation, rather than the other way round. Chinese policymakers favoured a learning-by-doing approach. A reform would be tested in a particular area, often in a haphazard way. Research would then play an important role in evaluating success and making recommendations on whether to extend an innovation or alternatively to quietly drop it. With town and village elections for example, the experiment was allowed to happen, in quite an *ad hoc* way; research came in afterwards and assessed achievements. It was also noted in a general discussion that some early reforms happened quite quickly as a response to a fiscal crisis around support for rural areas.

Several key elements were identified as important in the Chinese 'experimentation and learning' model:

- Learning is locally rooted.
- Learning is adaptive.
- Think tanks have played an important role: documenting lessons, analysing and feeding recommendations to the Chinese leadership.
- Experiments are insulated from the wider society and economy, for example rural reforms began in relatively remote or isolated and poorest parts of Gansu and Anhui. This means in the event of failure repercussions are contained.
- Some participants argued it has been important to avoid politicisation of experiments and learning processes (though it is clearly the case that within decision-making circles many reform experiments were highly controversial and hotly debated).
- The space for experimentation needs to be granted by senior leaders strongly committed to reform (eg Wan Li, then Party Secretary in Anhui).

Some participants suggested that there is a need to be cautious about China's success. While there is justifiably a lot of excitement about what China has achieved, research also needs to pay attention to some of the problems – access to health care and basic education in the countryside, the environmental costs of development policies, water pollution and decline of groundwater, for example.

Participants pointed out that there are many examples of research that generates technologies that support sustainable agricultural development and poverty reduction, (although there was not time to elaborate on this in detail). Some participants also made the case that China's success came as much from market and institutional reforms as technological innovation.

It is also the case that in the early stages of reform the Chinese system was very quick at passing new technologies to farmers, quicker than in other developing countries. However, it is now the case that the extension system is not working well. It was also argued that research is now not so good at working with complex, diverse

and risk prone areas as it is with the high-potential /high value crop areas that are the focus of agricultural modernisation strategies.

There is a concern that within China incentives for researchers have become distorted in recent years, with researchers focused more on attracting funds, meeting publication targets, and maintaining international profiles. Research has arguably become less focused on understanding and addressing practical grassroots problems and issues.

2.2 Are the lessons from China sufficiently well known?

The consensus was that lessons from China are not sufficiently well known. There is also plenty more that needs to be understood, particularly in relation to identifying exactly what role research has played in policy processes.

More efforts are also needed to capture local knowledge and experiences.

In disseminating lessons from China it needs to be made clear that there are pitfalls with trying to copy a Chinese model. China has a particular political and institutional system, and Chinese reforms do not necessarily transfer easily to other settings. One researcher discussed the case of India trying to copy the Chinese Special Economic Zone model, and noted how controversial and difficult this has been to implement in a different context. One task for research is to better identify what is generalisable, and under what conditions, with what kind of adaptation mechanisms, from what is primarily relevant to the Chinese context.

3. China's growing global role

3.1 Chinese researchers' participation in global research efforts

There was not a clear articulation in this meeting that there is a significant problem in relation to Chinese participating in research that addresses global issues. Researchers have sometimes not known how to access funds to work on global issues. However, there are more opportunities now than in the past and researchers do seem to respond to them (for example, via EU Framework funds, IDRC support for Southern knowledge and learning networks, the ESRC-DFID-NERC ecosystem services and poverty reduction programme which specified that a Chinese research team must lead the research consortium). Many Chinese researchers also participate in CG centre research programmes and initiatives, and indeed are employed as researchers in CG organisations (notably IRRI and IFPRI).

In relation to DFID, there is a marked lack of understanding of DFID priorities, and the role of DFID Central Research Division and its relationship with country programmes. It was not clear to what extent DFID would continue to support research in China as part of the centrally defined research agenda. What will happen when the DFID office closes is also not well understood. Chinese researchers were not clear how they are (or will be) able to apply for DFID funds, and which types of opportunities are open to them.

There is scope for greater participation of Chinese researchers in global research processes on agriculture-poverty reduction as a global issue. Chinese participation appears not to be so strong in some of the initiatives emerging from African

governments and the donor community on African agriculture, for example: the Gates-Rockefeller supported Alliance for a Green Revolution in Africa; the Comprehensive African Agricultural Development Programme under the New Economic Partnership for African Development; and, the Forum for Agricultural Research in Africa. This is most likely because funders and programme managers have not realised what Chinese researchers have to offer. The FAO Special Initiative on Food Security has however engaged African researchers, especially through the South-South cooperation programme. It would be worth capturing lessons from this.

It should also be noted that Chinese agricultural and rural development research has focussed on Chinese issues. It has not been a priority to research other settings, and the assumption has been that the international research literature would provide much of the information that was needed on any given country. This may be changing.

3.2 Chinese research on agriculture in Africa

There appears to be some *ad hoc* research into China's impact on African agriculture, African farming systems and rural development. There was not enough time in the consultation to go into this in detail. Some work is not formal research, but studies that result in reports to government leaders. Researchers at Zhejiang University have been involved in poverty research and training (for African officials).

There are many programmes managed by MOA, MOFCOM, MOST and CAAS, which seek to transfer Chinese research outputs to Africa. Several participants expressed the view that this is not done very well at present. Chinese technology transfer efforts are strongly supply driven. There is however plenty of demand for lessons from China, but current modalities do not appear to be delivering well. Researchers expressed the hope that DFID might be able to contribute to improving this situation.

There is scope for learning more about exactly what research initiatives the Chinese government and other Chinese actors are supporting in Africa.

3.3 Priority areas for research collaboration in relation to African agriculture

Participants identified a range of areas, which merit further research attention. These included: research into conditions for greater access to Chinese markets for key African export commodities (cotton, coffee etc); food safety (including Sanitary and Phytosanitary Measures, SPS); biotechnology, and, biosafety risk assessment and management systems; crop pests and diseases; livestock and zoonotic diseases.

In relation to specific technologies, there is growing interest in Africa in rice production and export, and Chinese hybrid rice technologies could be relevant. There is a role for research in elaborating lessons from the Chinese Green Revolution and investigating its relevance for Africa, particularly given the current strong push from global institutions in this area.

Participatory research experimenting with Chinese ecological agriculture innovations (mixed cropping, agroforestry, livestock-arable systems, soil fertility, soil conservation and water management systems) should be another priority area. This would include Chinese ecological agricultural engineering, and initiatives in multifunctional rural energy-resource cycling systems, such as biogas-animal husbandry- soil fertility systems.

Extreme weather events are also highly relevant to both China and Africa, and there have already been research and practitioner exchanges on drought. Adaptation of agriculture to climate change is an area where there have been useful experiences in developing more resilient farming systems in both Africa (particularly the Sahel) and China.

Several areas were mentioned where African experiences may be a valuable source of lessons for Chinese researchers: examples include social protection and microfinance.

3.4 Challenges in relation to collaboration

There can be sensitivities around engaging Chinese stakeholders on China-Africa research agendas. Where the Chinese government is involved there is more likely to be an appetite for collaboration when research is seen as addressing global issues (such as climate change and zoonotic diseases), rather than issues that are understood as Chinese internal matters, such as how China spends its aid targeted on agriculture. While the boundaries in this respect are debateable, the key point is that good problem framing and establishing an acceptable rationale for collaboration are important tasks.

4. Recommendations:

1) There is a knowledge gap on the role of research in China's agricultural development, especially as it links to poverty reduction. Commissioning a short piece of research looking into this could address this gap.

2) DFID should be more proactive about communicating its research objectives and research opportunities to Chinese researchers.

3) There could be a dedicated fund/call for proposals for joint work with Chinese on agriculture in Africa (similar to the ESRC-DFID-NERC call on ecosystem services and poverty reduction).

4) Chinese researchers argue that attempts by the Chinese bureaucracy to transfer technologies are often too supply-driven. There is scope for sharing lessons and engaging Chinese bureaucrats and researchers in the DFID Research Into Use programme, as this is a specific attempt to address this issue (RIU is a programme that takes ten years of DFID Renewable Natural Resources Research and focuses on uptake and creating effective innovation platforms and pathways).

5) It would be useful to document what research and other activities China has supported on agriculture in Africa, although information from Chinese agencies will not be easy to access.

6) Investigate opportunities for experimentation and learning with Chinese agricultural technologies - both Green Revolution and ecological agricultural innovations and approaches - between practitioners and researchers in China and Africa.

7) Explore how to link Chinese research with some of the major international initiatives currently underway on African agriculture.

KILLER DISEASES AND HEALTH CARE

1 November, 2007 at DFID Offices, Beijing

Gerald Bloom, IDS

INTRODUCTION

Around twenty-five highly distinguished researchers and government officials met on 1 November 2007 to contribute to the global consultation on DFID's strategy for supporting research aimed at reducing the impact of killer diseases. They were joined by a few international participants with relevant experience. The participants did not include people involved in basic science, clinical research or the development of pharmaceuticals and biomedical technologies and so the discussions did not consider these topics. This note outlines the major points raised on other aspects of research on the response to the challenge of killer diseases.

The discussion was organised in two parts. The first focused on major research challenges over the next few years and potential lessons for other countries. The second focused on strategies for strengthening the contribution of Chinese researchers to global efforts.

RESEARCH CHALLENGES IN CHINA

The discussion began by exploring China's achievements in the health sector and the major challenges it will face over the next few years. Several participants emphasised the importance of the context of rapid change for understanding the evolution of health needs and the development of the health sector. It is important to anticipate health challenges likely to arise and it is important that researchers help government avoid costly mistakes, as it rapidly implements health system reforms, by supporting assessments of alternative strategies and monitoring for unintended consequences.

Changing health needs

China is experiencing rapid demographic and epidemiological transition. The ageing of the population, in combination with a rising prevalence of hypertension and diabetes associated with changes in diet, the use of tobacco and alcohol, and a sedentary lifestyle, has contributed to a growing burden of non-communicable disease (NCD). Environmental pollution is another contributing factor. There has also been a rapid growth in the problem of trauma, including traffic accidents. A health system designed to address quite different health problems is struggling to adapt to these new needs by developing innovative approaches to health promotion and the provision and financing of services. Research is needed on all aspects of this adaptation.

China still faces challenges from infectious disease, largely associated with poverty. There are still problems with access to clean water, which exposes people to the risk of diarrhoeal diseases. Tuberculosis remains a serious threat as does the epidemic of HIV and AIDS. There are also threats of outbreaks of new infections, often associated with changes in patterns of animal husbandry.

Several people emphasised the need to prioritise research on poverty and the factors associated with vulnerability to disease and the consequences of ill-health on household livelihoods. For example, it is increasingly common for grandparents to care for children in the countryside, while the parents work in the city. This is an efficient way for households to benefit from new economic opportunities, but it makes

them vulnerable to serious disruption should a key person fall seriously ill. This raises enormous challenges for the design of appropriate health and social support services. Participants suggested that it is often important to take gender relations and ethnicity into account in the design of health interventions. One person emphasised that social scientists need to become more involved in studies of health and health systems to provide a greater evidence base for the design of interventions.

The participants emphasised the need for research on new approaches to primary health care. The issues raised include health promotion, training of health workers and the use of the new rural health insurance schemes to influence provider performance. There was a lot of discussion of the relationship between vertical programmes and grassroots services. We discussed the substantial fall in maternal mortality over the past few years. Several people pointed to persistent problems with morbidity and with high levels of mortality in certain areas. They emphasised the need to take gender relations into account in developing new models of grassroots maternal health services. Others pointed to the health problems of some minority ethnic groups. We also discussed lessons from the tuberculosis programme. People attributed its success to effective management of a disease-specific programme. One difficulty with implementation has been the weakness of the grassroots health network. More research is needed on ways to integrate vertical programmes into new ways of organising community health care.

There was some discussion of the implications of environmental challenges for public health services. This will involve, for example, the development of alternative strategies for the provision, management and financing of clean water. One issue of particular concern is the role of village health workers in the identification of environmental hazards that could have a deleterious impact on health. Another is the possible development of low cost kits to test water safety and other potential hazards.

Innovation and the need for evidence of good practice

Another theme that emerged is the need to identify successful innovations, assess their performance and disseminate the evidence. This will be increasingly important as reforms are implemented. This will create a demand for systematic evidence of the impact of alternative interventions. One person referred to the reforms as “quasi-experiments”, emphasising the importance of measuring impact. One example is the recently introduced county-level health insurance schemes, known as “NCMS”. Counties have a lot of flexibility in designing their schemes. There is a need for systematic evaluations of the degree to which alternative models provide cost-effective care, contribute to equity and help households cope with the financial impact of major illness. This evidence will be useful to national policy-makers, those responsible for managing local schemes and the international community.

There was a lot of interest in the development and evaluation of good practice models. One person advocated randomised clinical trials of treatment strategies to inform the construction of basic packages of effective and cost-effective treatment.

One topic of interest to China and the international community is the potential role of TCM (drugs, acupuncture and other methods) in the provision of low cost health services. This will involve systematic assessment of the outcome of the use of TCM, on its own, or in combination with western medicine.

We discussed the parallel systems of information that exist and are being constructed. These include the regular national health household surveys, routine health management information, information on poor households collected by the Ministry of Civil Affairs and the electronic information systems that both urban and

rural health insurance schemes are establishing to facilitate billing. The participants emphasised the need to take into account monitoring and evaluation when these systems are designed. Otherwise, a major opportunity will be lost.

If China succeeds in creating reliable and appropriate information systems, it will have a very important resource for evaluating health reforms and testing interventions. Chinese researchers would then have the potential to participate in large international trials that could benefit policy processes in China and elsewhere. This would constitute a major global public good. This may be an area for mutual learning between countries.

The participants emphasised the lack of relevant information for identifying the needs of specific vulnerable groups and for supporting the design and evaluation of interventions. One example is the lack of a breakdown of routine utilisation data by sex. There is also little information on the special problems of the very poor or of those belonging to particular ethnic groups.

The participants emphasised the value of cross-disciplinary approaches that employ a combination of qualitative and quantitative methods and draw on different social science disciplines. This kind of approach is essential for understanding the barriers to access to services and the potential impact of alternative interventions.

Use of evidence for decision-making

A number of participants emphasised the need to find better ways to encourage policy-makers and health service managers to use evidence. They mentioned several ways to achieve this. One is to involve stakeholders at all stages in the research process. A second is to provide more opportunities for researchers to discuss their findings, learn from each other and identify policy-relevant evidence. Another is to provide more effective ways for researchers to share their findings with policy-makers. There was some discussion of the need to strengthen the capacity of policy-makers to use evidence in strategic approaches to planning. Several people identified the need for tools to operationalise approaches that have been shown to work.

Several participants pointed out that strategies for communications and policy influence should not focus solely on senior policy-makers. In China's highly decentralised health system, decisions by local officials and health facility managers are influential. One participant suggested that better use could be made of information technology to make evidence available to these people. Another mentioned the need for ways to translate research findings for use by grassroots level personnel. Amongst other things, this will involve the production of guidelines and other materials for the use of these personnel.

There was a discussion of the role of knowledge and understandings on the behaviour of individuals in exposing themselves to risk and in seeking health care. More work is needed on where people get health-related information and how health promotion could be made more effective.

STRENGTHENING INTERNATIONAL PARTNERSHIPS

There was an extended discussion of how the Chinese research community fits into the international context. This involved an exploration of how China benefits from its links with research institutions in other countries, how Chinese researchers can contribute to the success of global health initiatives and how other countries could learn from China's experience. One major conclusion was that the effectiveness of

cross-country learning is strongly influenced by the quality of the partnership arrangements.

Several participants have been involved in international research consortia or large development projects. They suggested that the benefits from partnerships with UK institutions have included support for the development of new research methods and exposure of researchers and policy-makers to alternative approaches to health system development. These were seen as major benefits of research partnerships. Several people stressed the need to invest effort in the creation of productive partnerships based on mutual respect and an understanding that learning is a two-way process. There was a general consensus that Chinese researchers need to build their capacity to develop proposals, design large scale studies and participate in complex consortia.

Most partnerships have been with advanced market economies however, the participants expressed an interest in learning from the experiences of middle-income countries that have implemented health system reforms in contexts of rapid economic and institutional change.

The participants have had little experience with partnerships with low-income countries. However, they drew lessons from the experience of the transfer of lessons from Eastern to Western China. The participants agreed that it was important to summarise key lessons and back them up with evidence. However, they pointed out that visits of government officials, health service managers and researchers from West China to good practice models in the East played an important role in inter-regional learning. This has important implications for the more difficult task of transferring lessons between China and countries with very different cultures and histories.

The participants sought lessons from their experiences with multi-country consortia. They agreed that researchers from China and other countries need to build an understanding of the context in both countries to facilitate effective communication. Approaches for addressing this need include the provision of opportunities for researchers from low-income countries to study in China and for Chinese researchers to participate in studies in other countries. They concluded that the creation of effective partnerships requires a substantial investment of time and effort.

There was less discussion of China's growing role as a source of innovation in basic science, health technology and health system organisation. Examples raised include: the potential role of traditional Chinese medicine and the development of low cost technologies. One participant cited the example of ICIMOD, which involves partners from all countries in the Himalayan region. When other partners learned of China's progress in creating a disaster preparedness plan, their governments asked for opportunities to learn from this experience.

The discussion only touched on how research can contribute to regional and global initiatives. Examples raised included exchanges of experience on the regulation of blood safety and the establishment of cooperative links between national health statistics institutes to foster cross-country comparisons of health system performance.

The participants identified barriers to the effective participation of Chinese researchers in international partnerships. These include a lack of information on funding opportunities and difficulties in making initial linkages with appropriate partners. Also, many calls for research funding do not provide enough time for the development of ambitious proposals. Finally, measures could be taken to ensure that

China is represented on the governance bodies of large research programmes. This might apply to the global DFID research programme.

KEY MESSAGES

This was a relatively short and intensive discussion and it is impossible to draw consensus conclusions. However, several issues require attention.

1. China has experienced substantial successes in improving health and consideration should be given to an investment in systematic assessment of the evidence to make lessons available to low-income countries.

2. China is experiencing an array of new health challenges and policy-makers and health managers need evidence to support their efforts to address these challenges. Particular attention should be paid to the emergence of new patterns of vulnerability, the associated health needs and practical strategies for meeting these needs.

3. As China accelerates the implementation of health system reform the need for evidence on the impact of particular initiatives and on the emergence of unintended consequences will become increasingly important. The evidence on the performance of a variety of innovations will be of interest to low and middle-income countries.

4. China is likely to become an important source of innovations in basic research, the development of technology-based products and the organisation of health services. Mechanisms are needed to ensure that other countries have access to evidence on the performance of these innovations and that Chinese innovators have a better knowledge of contexts in other countries where these innovations might be used.

5. China needs to pay attention to the creation of information systems that contribute to the monitoring and evaluation of the outcome of the reforms. This will provide opportunities to contribute to large-scale collaborative studies of a variety of clinical and health system interventions that could benefit low and middle-income countries.

6. There is a need for opportunities for exchanges of evidence and experiences between countries on the basis of equality and mutual learning. It is important that consortium partners develop a good understanding of the contexts in other countries to enable effective cross-country learning. This should involve opportunities for a variety of types of exchange of researchers and policy-makers between China and other countries. This takes time and substantial investment of resources and effort. The design of funding opportunities should take this into account.

7. DFID should consider measures to enable Chinese researchers to engage more effectively in existing research partnerships and to join or lead new ones. This could include training for Chinese researchers and the provision of opportunities for researchers to establish links with potential partners in other countries. DFID could strongly encourage new consortia to include Chinese partners. Alternatively, it could provide funding earmarked for the participation of Chinese institutions in certain consortia. It could also include Chinese stakeholders in the governance arrangements for its research programme.

CLIMATE CHANGE

2nd November, 2007, DFID China Offices
Thomas Tanner, IDS

1. Introduction and Background
The consultation was well attended by a broad mix of participants, representing the breadth of the climate change community. This included a diverse range of expertise related to adaptation, air quality, energy efficiency, CDM development, renewable technology, carbon capture and storage, and trade policy.

The initial half of the consultation was framed by the **potential global impact of Chinese research and international collaboration.** There was significant overlap in the discussion with the second theme of **research needs on climate change and low carbon development in China.** The consultation sought to assess the appropriate balance between adaptation and mitigation research, the significant research gaps, and experiences of global collaboration on climate change.

Both sessions played a role in teasing out potential research priorities for DFID research support in China. The session benefited greatly from participation from Central Research Department, highlighting some of the key areas that had already emerged from consultations to date. These included:

- Livelihood adaptation, especially relating to agricultural techniques
- Disaster risk reduction and disaster management
- Climate change and human health impacts
- Improved understanding of climate science - applying and building capacity of impacts assessment nationally
- Cost benefit analysis of adaptation / mitigation to understand development trade-offs
- Options for low carbon growth including biofuels and their impact
- Carbon markets impact on the poor
- Capacity development, especially for undertaking and applying climate science.

2. General comments
Resonance of themes identified elsewhere: While there are particular nuances highlighted in the remainder of this report, an important conclusion from this consultation is the validation in the China context of many of the above themes from other consultations. The principle difference is the greater stress on mitigation rather than adaptation, visible in the representation at the consultation from the mitigation community. This reflects both the internationally significant impact of China's emissions pathway, and growing debates on low-carbon development in China itself.

Potential to enhance capacity: Research work on climate change issues remains in its infancy in China, in common with much of the developing world. However, China's size and significant existing institutional research capacity suggest that a scaling up collaborative efforts is achievable in a relatively short space of time. DFID can play an important role in strategic investment in research to develop key areas, placing national climate change issues in an international and poverty context.

Geographical dimensions: As a general rule, China research has tended to focus on eastern regions. Cooperation with mid- and western China is needed in order to enhance understanding of climate change issues and particularly demonstrate their relevance to the provincial and prefecture level. The transformation processes of mid

and western regions will provide important lessons for other developing country contexts. There is a clear imperative for regionally focused work given China's interdependence with other East and South Eastern Asian countries, as well as emerging links with Africa and central Asia.

Poverty dimensions: Actions in China to reduce emissions can be regarded as a global public good in preventing climate change and therefore of importance in whatever sector. Nevertheless, the consultation reflected a demand for and expertise in considering the poverty dimensions of climate change issues, consistent with the fourth thematic area of the draft DFID research strategy.

3. International impact and collaboration in China climate change research

China actions as a global public good: To date, the poverty dimension of DFID's focus has favoured an adaptation focus especially in poor countries with low emissions. However, given China's potentially globally significant role in stablising atmospheric levels of greenhouse gases, national mitigation activities constitute a global public good. This global dimension was central to the debate and gives a clear justification for DFID research to engage in mitigation issues in China.

Global nature of modelling: Climate modelling research is naturally international in nature due to oceanic and atmospheric inter-connectivity. China could both feed into and benefit from international efforts to understand better key driving forces, including the El Niño Southern Oscillation (ENSO), and the East Asian Monsoon. Links to work in Africa on transcontinental monsoon research were raised.

Inter-disciplinary linkages and cooperation: The discussion highlighted the cross-disciplinary nature of climate change research. For example, there is already much research on sustainable agriculture that is directly relevant. Linkages need to be exploited to bring existing research expertise to bear on climate adaptation. Water resource management research, including that supported by DFID, has the potential to link to the climate change research agenda. Similarly, energy efficiency, decentralised energy and renewables have a considerable baseline in China that can be tapped in the future for mitigation research. DFID therefore needs to ensure that funded climate change research links into other relevant areas of research, for example linking biofuels research with international work on agriculture, poverty, and trade as well as the energy market.

Trade and growth analysis: The discussion highlighted the need for more analysis of near-term issues rather than the longer term focus. Analysis on impacts of climate change policies and measures on trade are needed to feed into national policies and both trade and climate change negotiations internationally (especially for a post 2012 climate agreement). Developing existing capacity for 3E models linking energy, economy, and environment was cited as one way to address these needs. Collaborative international research could provide growth and trade implications of different carbon development pathways have important consequences for development of other countries outside China.

Modalities for international collaboration: Discussion fell short of listing successful models for collaboration. Nevertheless participants made clear that many climate change research activities are already undertaken as part of international research networks and collaborations. DFID's focus on international and inter-disciplinary research was welcomed, including linkages with developing countries as well as UK research partners. Further follow-up is recommended on modalities for effective partnerships.

Knowledge transfer: Communication and knowledge transfer were highlighted as areas of poor current practice that could benefit from international expertise, collaboration and networks. The vertical nature of much research in China often confines findings to a particular Ministry, and translating and communicating research to influence policy and practice was noted as a weakness. Creating networks and platforms for sharing related research findings across sectors would help China researchers reduce duplication and enhance collective understanding. International collaboration could improve communications and dissemination, initiating dialogue with policy makers early in the research process. DFID has a strong track record of supporting communications and knowledge transfer to draw upon.

Technology transfer: Research around the development and transfer of technology for both adaptation and mitigation was noted for its complexity. Linear conceptions of development and transfer from one location or country to another were dismissed as failing to capture the dynamic and iterative nature of technology processes; (Note that this has frustrated the negotiations around technology transfer under the UNFCCC). Nevertheless, technology was flagged as an important dimension to almost every aspect of climate change and therefore valuable to the international research agenda. Mapping out the experiences and aspects of transferability might be a starting point for this work.

4. Research needs on climate change and low carbon development

The areas of climate change research in China were mapped out during the second session of the consultation into the three key areas outlined below.

Climate sciences: There remains a knowledge gap about future climate in China to help improve understanding of the urgency of the problem. There are still disputes over whether climate change is a major issue in China, especially as historical trends show considerable natural inter-annual variation and extreme events have been commonplace for years. Research into the interaction of global and regional climate processes therefore remains an important building block to creating policy change in China, along with greater evidence of changing sea-levels and greenhouse gas emissions levels.

Impacts and Adaptation: Research into the many facets of impacts and adaptation remains limited to date. Key sectors highlighted included agriculture and food security, ecological integrity, health, extreme events and disasters, and water resources. There remains little knowledge on what vulnerabilities exist and where they are most important and who they will affect most. There is little work on adaptation processes, resourcing, and technology in China. Interestingly, coastal threats were not highlighted by participants, but are significant given the significant numbers living in Chinese coastal areas, especially urban areas. Notably, migration and urban aspects of climate change also received little specific attention during the consultation. A major missing link in the consultations was to the disasters community, which has considerable experience in China.

Mitigation: Mitigation research areas can be subdivided into:

a. Energy sector: Research includes supply side aspects such as the energy mix and diversification, technology, energy efficiency and transmission. It also relates to demand side aspects focusing on the industrial, commercial and sectors. Energy efficiency and low carbon infrastructure have been important to date, with much greater work needed on the implications of the production and international consumption on China's energy demand.

b. Social sectors: Social aspects of mitigation research can be linked with other sectors related to poverty alleviation including sustainable natural resource management, environment awareness and education, and disaster risk reduction. Note that the impact of recent family planning policy on reducing emissions was highlighted by the Chinese Government's recent National Climate Change Programme as a major contributor to avoided emissions.

c. Sectors specific to climate change: These are research areas specific to the climate change issue, including carbon capture and storage, the Clean Development Mechanism, emissions trading, carbon taxation, and forestry and sinks (the importance afforded to the large scale national afforestation programmes in contributing to mitigation was heavily stressed in the China National Climate Change Programme).

d. Macro-economic policy: Linkages with trade policy, energy and carbon taxes / prices, national emissions trading all have significant linkages to the mitigation of greenhouse gas in China.

5. Some initial research priorities

The discussions reported above point to a number of potential entry-points for DFID's Central Research Department. Funding strategies in these areas might link to a number of contingent factors including linkages to poverty reduction, linkages with research in the rest of the world (particularly Africa and south Asia), and there are few other research funders active in these areas.

1. Impacts and Adaptation

Research to improve understanding of climate change impacts, including key sectors of waters, coastal zones, agriculture and health). Impacts research should be linked to adaptation development in China, ensuring geographical coverage across China and down to provincial and prefecture levels. Linking to the disaster community also appears to be a major missing link to date. This work might be linked to the development of the DFID-IDRC Asia research initiative.

2. Technology development and transfer

The implications of energy technology acquisition at the local level, including improved understanding of how local infrastructure investment decision making. Lesson learning is required on potential for mutual learning and transfer between China and other developing countries on mitigation and adaptation technology. This could draw on lessons from the health and agriculture sector, clarifying the role of public sector investment in this process.

3. Distributional impacts of mitigation

Research into how mitigation efforts might positively and negatively impact on poverty reduction goals. Biofuels provides a key emerging research area linking adaptation, mitigation, food security, trade and livelihoods. Distributional aspects of different low carbon development pathways in different parts of China and other regions could link to the research area on growth.

4. Trade and growth analysis:

Analysis of trade consequences for emissions pathways, and impacts of different climate change policies and measures on trade are needed to stimulate and inform national policies and debates.

5. Sectoral mitigation cost-benefit analyses

Potential for energy efficiency varies across sectors and regions. Research into mitigation efficiency could be crucial in stimulating change through limiting emissions in China and stimulate similar processes elsewhere.

6. Communicating research and policy linkages

The consultation highlighted communications and linking research with policy and practice as a major area where researchers felt that international collaboration could add significant value. A meta-analysis of existing work could provide a first step to make best use of existing knowledge and communicating key messages.

APPENDIX 1: List of participants (see attached file)

APPENDIX 2: (To be added)