New partnerships with emerging economies for global impact on agriculture and food security: lessons from India.

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Views and opinion in the paper are of the author and do not necessarily reflect the UK Government's official policies.

Summary

To accelerate progress on global food security will require every tool in the box. Emerging economies offer a useful range of tools, and a rich seam of recent, relevant experience that developing countries can tap to drive impact on hunger and poverty. This paper explores the value of building new knowledge partnerships between developing and emerging economies, drawing on specific examples from the UK Department for International Development's recent experience of working with India. These new approaches and new partnerships span initiatives that aim to test the feasibility, effectiveness and sustainability of India's affordable innovations (technology, institutions, policy); share lessons learned from India's development pathway; experiment with new trilateral research models; and build the evidence base. These early experiments are offered as a reference point to spark continued thinking on how new partnerships can be formed with emerging economy actors for impact on global poverty.

The food security challenge

This year the number of hungry people in the world dropped to 795 million – 216 million fewer than in 1990-92 (FAO, 2015). Nevertheless, the fact that one person out of every nine is still undernourished indicates that food security must remain high on the list of global development priorities if we are to realise the ambition of becoming the "Zero Hunger generation"[1]. Plus, there we face an even greater challenge to address the different forms of malnutrition that some half of the world's population still suffers (IFPRI, 2014). Net global production of food is in theory sufficient for all (FAO, 2015), but, farming systems need to continuously innovate to ensure that productivity keeps pace with growing population and dietary habits. Global annual growth

[1] FAO Director General José Graziano da Silva, 27 May 2015: http://www.fao.org/news/story/en/item/288229/icode/

rates in yields of major grains have declined from 3% in 1980 to 1% today (WDR, 2008).

Our failure to adequately feed the world population has stark implications. Malnutrition is responsible, directly or indirectly, for 45% of deaths among children under five (Taylor et al, 2013), adds to the global burden of disease, robs children of their long term productive and cognitive capacity, and puts a brake on national economic development as a result. Current childhood malnutrition is expected to cut future earnings by 20% and cost the global economy $125bn when today's children grow up (Save the Children, 2013). Tackling hunger and under-nutrition is therefore simply good economic sense, as well as a moral imperative.

Pressure points at the food-water-energy nexus

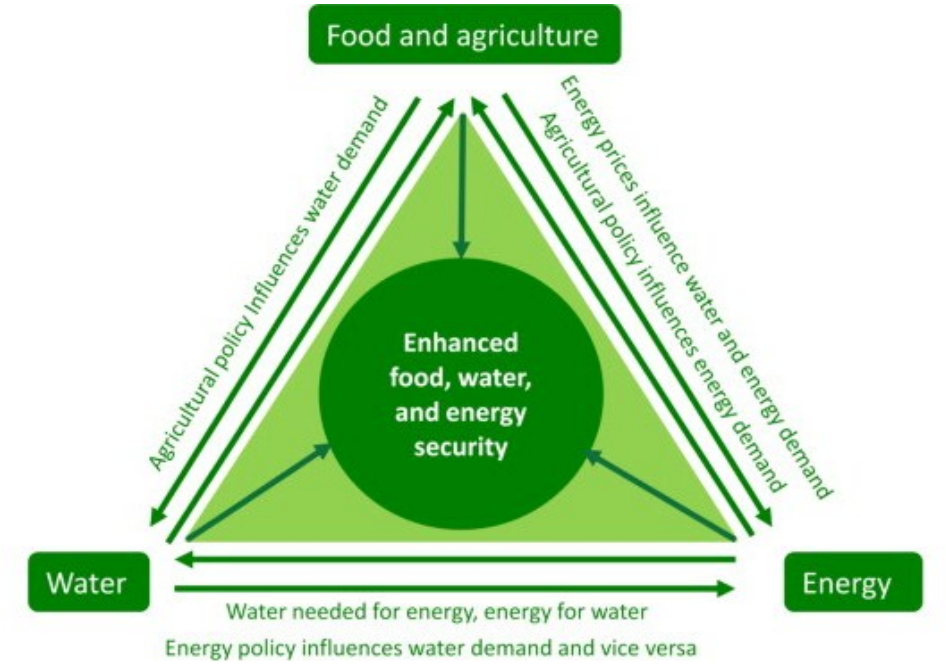
Shortfalls in food security are compounded by linked challenges related to water and energy security. Agriculture already accounts for around 70% of freshwater withdrawals in a world where some 0.9 billion people lack access to safe water (WFP, 2010) and where demand for water is expected to grow by 40% by 2030 (ERD, 2012). Nearly 1.2 billion lack access to electricity, and close to a billion are expected to still be without by 2030 (IEA, 2014).

While linkages between these challenges have always been present, demographics, economic growth and consumption patterns are driving increasing demand for resources at an unprecedented rate, with climate change and variability acting as an unpredictable stress multiplier. These pressures will place increasing demands on food security at a time when competing land uses are growing rapidly. In sum, feeding 9.2 billion by 2030 is estimated to require 50% more (and more nutritious) food; 30% more water; and 50% more energy (Stein and Quaim, 2007).

It follows that pressure points will continue to emerge at the 'food-energy-water nexus'[2] (Figure 1). Solutions for one part of the nexus may well be found in another; equally, solutions that fail to assess links with other parts of the nexus may end up generating new and unexpected problems. The first shift in approach proposed by this paper is therefore to deepen use of nexus approaches to improve analysis, reframe problems and seek innovative solutions.

[2] Popularized since the 2011 Conference "The Water, Energy and Food Security Nexus – Solutions for the Green Economy". Nov 16-18, 2011, Bonn.

Figure 1: The food-energy-water nexus



Source: Khurana et al (2014)

New partnerships bring new perspectives and possibilities

A global effort that can drive change at the pace and scale required will need better implementation of existing effort, but also continued innovation through new approaches and new partnerships. Development actors need to challenge themselves to work differently, in order to promote new perspectives and evidence that can be used to fight hunger and poverty, and find solutions to interlinked resource challenges.

One promising area of new partnership work is with 'Emerging Power' (EP) nations like China, Brazil and India. The rationale for such enhanced engagement with EPs is strong, given their increasing influence on the global political and economic landscape, role in global development, and emergence as partners for developing countries.

The importance of Emerging Powers (EPs)

EPs are important global development actors by virtue of:

- their **size**, growth and influence on the developing world, particularly through trade and investment. BRICs nations accounted for about 20% of total developing country exports and 15% of developing country imports in 2009 (IMF, 2011). The China Development Bank had $10bn in active loans to Africa in 2010, while India provided $10 billion in lines of credit from 2005 to 2013 in 75 developing countries;
- their **voice and influence** in global processes: Over the next couple of years, EP nations will chair the G77 through the post-2015 negotiations (South Africa); chair the G20 (China); and host the next major Nutrition for Growth event at the Rio Olympics (Brazil). EPs are often seen as increasingly important allies to developing countries in the global architecture relative to relatively 'declining' western powers;
- sharing **recent, relevant lessons** and knowledge learned along their development pathway. In China, poverty declined from 84% to 12% over the period from 1981 to 2009. In India, poverty fell from 55% to 32.7% over a similar period. Brazil expanded crop production by 270% between 1976 and 2010 with only 45% increase in harvested area (Albuquerque and Da Silva, 2008); and halved child malnutrition in ten years (CONSEA, 2009). Transformation of smallholder agriculture has been an important part of the story in all of these countries, providing a host of lessons for those countries where agriculture remains an important driver of growth and poverty reduction;
- appropriate, adaptable and **affordable innovations** that can be tested and adapted in developing country contexts, including China's productivity-enhancing agricultural technologies; India's institutional models for agglomerating and scaling up (e.g. White Revolution in milk production) and use of ICT to deliver services; and Brazil's successful multi-agency 'Zero Hunger' policies.

Recognising that EPs can "provide an impetus to transformational change" (Dercon et al, 2014) in tackling global poverty and hunger, the UK Department for International Development has been working to deepen its engagement with actors in China, India, Brazil and South Africa. Working with EPs in this way marks a further diversification in the tools that DFID uses to fight poverty.

The intention here is to complement and enhance EPs' own efforts and leadership, as a supporting partner for south-south cooperation (Bradley, 2012). Partners have welcomed this supporting role as a means to help manage the growing demand from developing countries for support from EPs; access advice; support enhanced focus on results and impact; enable appropriate adaptation of EP tools in developing country contexts; and help kick-start promising initiatives.

As part of DFID's EP engagement, this paper sets out examples from DFID's global development partnership work with **India** on agriculture and food security. As well as pursuing poverty impact in developing countries, this work aims to:

- assess the effectiveness of different models of partnership;
- engage governments in policy dialogue;

- build evidence on India's best practice, and where it can be best tested and applied; and
- build new knowledge partnerships and capacity to enable developing countries to partner better with EPs and access their tools.

These examples span initiatives that aim to spread **innovation**, share **lessons** and good practice, build the **evidence** base, and experiment with new **research models**. These are offered as a reference point to spark continued thinking on how new partnerships can be formed with emerging economy actors for impact on global poverty.

India's value as a learning partner on agriculture and food security

India is seen by some as a paradoxical learning partner for developing countries, being:

- one of the largest emerging economies with some of the largest domestic development programmes in the world; yet facing challenges of food and resource scarcity similar to those of Low Income Countries;
- one of the biggest agricultural producers of key commodities (e.g. wheat, rice, milk) 'self-sufficient' in grains at national level and one of the biggest stock-holders of grains in the world; yet carrying one of the largest burdens of hungry and malnourished people. According to national surveys, 43% of children under five are malnourished (low weight for age) and 48% are stunted (low height for age); 36% of Indian women are chronically undernourished and 55% are anaemic (IIPS, 2007).
- An agricultural innovator, yet per hectare is still around 30% lower than the world average and losses through waste may be as high as 30-40% in some commodities.

However, India is far more than a big country with big domestic challenges. Its capacity to invent, finance and spread technologies to meet prevailing challenges is vast. Many enabling policy instruments, market-based initiatives and programmes have been launched at an unprecedented scale. And its human capacity is a valuable resource for developing countries to tap, from science and affordable innovation to entrepreneurial experience. The fact that India has not solved all of its domestic problems makes it a highly relevant learning partner for countries grappling with similar challenges.

Recognising this potential development resource, DFID is experimenting with a range of 'catalysing and connecting' programmes, to spread and test India's affordable innovation; share lessons from India's development path; develop models of trilateral research; and build the evidence base on what India has to offer developing countries.

i. Spreading India's affordable innovations

DFID's *Innovative Ventures and Technologies for Development* (INVENT) programme aims to test and adapt India's affordable, quality innovations (technologies, institutions, policies) in partnering countries in areas that offer

the best prospects for impact on agri-food systems. INVENT is channelling innovations using three distinct instruments, and capturing learning on the pros and cons of these for achieving impact:

- *Innovations Knowledge Exchange Facility*: to catalyse demand in LICs for pro-poor Indian innovations, and build partnerships to meet demand.
- *Grand Challenges:* calls will issue later in 2015 on innovations that contribute to agricultural productivity, sustainability and nutrition.
- *Millennium Alliance:* originally an India-focused MA challenge fund, DFID negotiated the addition of a global window to the feasibility of Indian innovations in new countries facing similar challenges (Box 1).

Box 1: Testing the feasibility of India's agricultural innovation:

- Getting more crop per drop through the Sustainable Sugarcane Initiative and the System of Rice Intensification (Kenya).
- A web-based real time farm management tool for monitoring and traceability of farm produce (Kenya).
- New Help Centres providing agriculture extension and access to market services, run by local youth (Nepal).
- A climate-smart technology to free up waterlogged land for agriculture and recharge groundwater (Bangladesh).

Sharing lessons and expertise from India's development path.

Initiatives like DFID's *Knowledge Partnership Programme* (KPP)[3] aim to identify and share evidence and expertise central to India's development with potential for replication in developing countries. Examples of knowledge sharing activity include:

- Digital model of agriculture extension in Ethiopia: using community-based video production techniques developed in India, 8,000 farmers in Ethiopia are benefitting, and 14,000 best practices have been taken up with 90% adoption rate, driving productivity and complementing Ethiopia's national extension system.
  - Legal frameworks for food security strengthened in Africa and Asia: a synthesis of ten key debates that led to India's National Food Security Act and implementation of the Right To Food will be used to stimulate three Global Dialogues. These will offer India's experience as a reference point to countries that are seeking to strengthen national food security policies and legal frameworks.
- Market Information System transforming data and decisions[4]: India's new AMIS system is transforming the accuracy of global data on agricultural commodities; informing trade and food security decisions by developing countries; and the models used in its development are now being applied to strengthen national systems in four countries.[5]
- Tackling challenges at the food-energy nexus: Bangladesh is squandering agricultural topsoil through a huge brick-making industry needed to build 4 million houses annually for its expanding population. Unfired Fal-G brick

[3] www.ipekpp.com/
[4] http://ipekpp.com/admin/upload_files/Report_1_6_OECD-FAO_1578856528.pdf
[5] Thailand, Philippines, Bangladesh and Nigeria.

technologies from India that use flyash and debris could "save Bangladesh's paddy fields"[6], conserve energy, and solve a major future challenge of managing waste flyash from Bangladesh's next generation of super-sized power plants. Every one million fly ash bricks avoids the use of 4,500 tons of fertile topsoil, 260 tons of coal equivalent and 381 tons of CO_2 emissions.

Diversifying into models of trilateral research

DFID's *Global Research Partnership* programme raises trilateral research calls that aim to tackle global development problems using the best of UK and Indian science together with developing country experience**.** The first research call on food security addresses Aquaculture for Development, recognising that fish is an important and growing source of protein for many developing country communities. Trilateral approaches to research design drew on an intensive 'sandpit' methodology, that brought together diverse groups of researchers from UK, India and developing countries to blend and build ideas[7]. The resulting proposals Initiatives to improve the impact of aquaculture on hunger and poverty in South Asia and Africa are currently under consideration.

Stronger evidence base to inform influencing and programming

The programmes above will generate a range of findings and knowledge products that will help to strengthen the evidence base on how working with India can help to tackle poverty in developing countries. Several initiatives were in turn informed by scoping studies on India's best lessons on food and nutrition security (Saxena et al, 2014); and on India's potential global resource footprint at the food-water energy nexus (Khurana et al, 2014). These syntheses raise as many questions as they answer, indicating that there is significant scope to deepen our understanding of India's potential global role in this area.

Conclusion

To accelerate progress on global food security at the pace and scale needed will require every tool in the box. Emerging economies offer a useful range of tools, and a rich seam of recent, relevant experience that developing countries can tap to drive impact on hunger and poverty.

Emerging economies are starting to play a more significant role on the global development stage. Building new forms collaborative partnership with emerging econoomies for positive development outcomes in partner countries helps to build understanding of the distinctive tools and perspectives that these development actors can bring to bear on tough development problems.

[6] Pers. comm. Government of Bangladesh, Roundtable on Promotion of Resource Efficient Brick Making in Bangladesh, 3 May 2015: Dhaka.
[7] Developing aquaculture for food security, development and poverty reduction in developing countries. 23-26 February 2015: Thiruvananthapuram, Kerala.

Experimenting with new forms of knowledge partnership can connect emerging and developing countries in new ways to address hunger and poverty challenges, with development agencies offering catalytic support. Early experiments to spread innovation, share lessons and build new forms of trilateral research partnership are promising, but evidence of impact and effectiveness is still nascent. There is significant scope to deepen this mode of engagement in order to assess the impact of different models.

Fora like GDN may wish to consider specific initiatives to strengthen the capacity of developing country researchers to engage in productive collaborations with Emerging Power actors in order to innovate, generate fresh perspectives and build a more effective global partnership for development.

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