

FOUR HORSEMEN OF THE GLOBAL ECONOMIC SYSTEM: DOOM OR DELIVERANCE FOR SOUTH ASIAN AGRICULTURE?

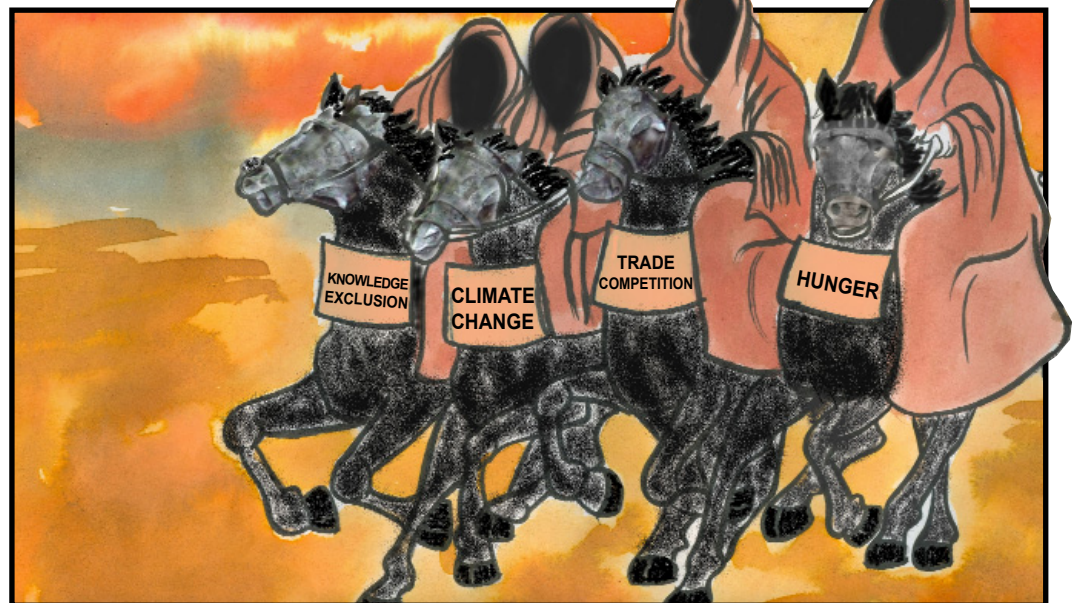
Agriculture in South Asia faces the spectre of the four modern day apocalyptic horsemen of the global economic system — hunger, climate change, trade competition and knowledge exclusion. In this month's LINK LOOK Andy Hall and Rasheed Sulaiman V. argue that South Asia — a region that is home to half the world's poor — is vulnerable to these challenges because of weaknesses in current patterns of agricultural innovation capacity. They also, however, argue that many of the capacity building blocks are already in place and that a few relatively simple institutional changes could unleash powerful creative forces capable of converting these harbingers of doom into poverty-reducing opportunities.

FRAGILE SUCCESS

The new millennium has seen a spectacular improvement in the fortunes of some South Asian countries, particularly India. Although GDP growth rates are slowing from India's peak of nearly 10% in 2006, most South Asian countries managed nearly 7% in 2007. Yet headline development success stories mask the worsening outlook for poor people. Agriculture growth, critical for poverty reduction, stagnated. Progress on poverty reduction was consequently disappointing and the decline in poverty levels of less than 1% a year was only possible due to low food prices in the early years of the new millennium. The global food price crisis now threatens to undermine even this meagre progress. But this isn't a one-off crisis. Uncertainty and shocks are the emerging features of the global economic system of the 21st century. Unless South Asian agriculture can continuously innovate and stay one-step ahead, progress in reducing poverty might not only be slowed; it could be reversed.

THE NEW (AND OLD) FACES OF DOOM

Hunger: This is the year that saw the return of food queues in South Asian countries. Partially, this was a



case of global price shock, exposing weaknesses in food and trade policies. For example, food scarcity in Pakistan (a food surplus country) was a result of price controls that unintentionally promoted smuggling to food-scarce Afghanistan, where prices were higher. However, cereal yields have also plateaued across South Asia and earlier increases have often had huge environmental costs. Increasing the productivity of

food, and indeed all agricultural commodities, in an environmentally-sustainable fashion is a major unresolved challenge for the region.

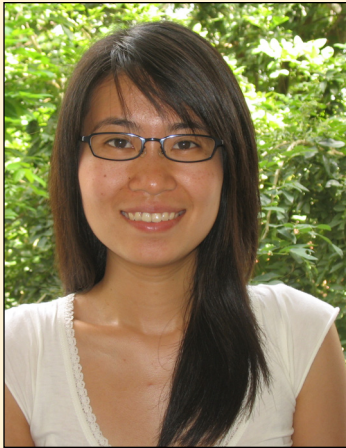
Climate change: Temperature and rainfall changes will add to the difficulties of agricultural production in areas where groundwater resources are already severely depleted, such as parts of India. Seawater inundation will increase

salinity problems in coastal and low-lying areas, such as Bangladesh. Pest and disease dynamics are likely to change, further challenging an already-fragile production system. Coping with this new range of problems — and doing so in an environmentally-sustainable way — will be critical to the livelihoods of millions of rural people in the region.

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Visit the LINKLook blog at www.link-look.blogspot.com for more views and join in the ongoing debate.

LATEST AT LINK



GUEST EDITOR FOR LINK NEWS BULLETIN

Michelle Chan, who just completed a six-month stint as visiting scientist with LINK at its West Africa hub in UNU-INRA, was guest editor for the July LINK News Bulletin. During her time with LINK, Michelle, who is from Canada, visited LINK's Hyderabad office in July, 2008.

LINK RESEARCHERS AT GLOBALICS MEETING

LINK PH.D researchers Ekin Keskin and Lina Sonne will participate in the 6th international conference of GLOBELICS, to be held in Mexico City between September 22 and 24, 2008. Ekin will be presenting a paper titled "The role of intermediaries in innovation response capacity development: The case of livestock in Ethiopia". Lina will be presenting on "Financing and rural innovation: what do we know and what can pioneering organisations tell us?". The theme for the Mexico conference is "Innovation in indigenous knowledge systems and in traditional sectors (e.g. agriculture, handcraft, clothing, eco-tourism, etc.)". For further details visit http://globelics_conference2008.xoc.uam.mx/.

INTERNS WANTED

LINK is seeking interns for the Hyderabad office to lend a hand with its research and outreach activities. Candidates with an international development, agriculture or related background are encouraged to apply for the internship, which will last from 3-6 months. For more details on the positions please email us at and send your curriculum vitae to info@innovationstudies.org.

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Trade competition and compliance:

Countries in the region have agro-environments suited to a wide range of products suitable for national, regional and global markets but are often unable to develop the value chains needed to assure quality and comply with trade standards for export. South Asian countries also have difficulty complementing their agro-climatic advantage with innovation and knowledge-based competitiveness. So, for example, although India is the foremost producer of mangoes in the world, it is unable to export profitably to Europe whereas Costa Rica, despite having almost no tradition of mango production, is a major exporter of the fruit. Worse still, consumers across the region are faced with buying Chinese and American apples even though these are produced in abundance in the temperate zones of India, Pakistan and Nepal. Participation in the global value chain offers new opportunities for the poor — both as primary suppliers as well as through employment in the food processing and packaging industries. However, knowledge-based support service for value chain development is almost completely underdeveloped in the region.

Globalised knowledge economy: Rapid developments in the global knowledge frontier and in the emergence of new platform technologies have potentially high transformative powers relevant to agriculture and poverty reduction. For example, satellite technology saves the lives of artisanal fishermen who risk them in easily predictable storms; already developed advanced materials technology could prolong the life of high-value horticultural produce or provide rural households with safe drinking water. However, unless countries in the region have access to this knowledge, they could lose out even further in terms of knowledge-based global competition. New technology could further consolidate established patterns of power and control in global agro-industrial value chains. This weakens the abilities of South Asian countries to enter new areas of economic activity and undermines their negotiating power in international trade and other agreements.

Taken together these four factors could develop into a social and economic crisis on an unprecedented scale.

CAN SOUTH ASIAN AGRICULTURE COPE WITH ITS NEW FOES?

In the case of the food crisis the response of national governments and the international community has been to increase research spending and food aid (paying for food supplies). More research is certainly part of the answer in dealing with these four threats to poverty-reducing agricultural growth. However, on its own it is unlikely to be enough because the very nature of these problems suggests that research is only one part of a new matrix of players, policies and processes needed to use knowledge for innovation. While the idea of agricultural research working in splendid isolation and delivering modern technology to the masses worked (partially) in the past, something entirely different is now going to be required.

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WHAT IS DIFFERENT NOW?

The key difference between 20th and 21st century agriculture is the degree and scale of complexity. Of course, the farming and livelihood systems of the rural poor have always

been complex. However, their connection to the emerging global economic system means that they are now connected beyond the rural space. With this comes a socio-political and technological complexity of an order or magnitude greater than anything previously witnessed.

In practice this means that agriculture now has to reduce poverty, save the planet, make some people rich, and compete with the rest of the world. Interested parties in agriculture are no longer restricted to farmers, traders and local consumers. Instead they include corporate business interests, civil society groups and political considerations about environmental resources.

Farmers are no longer simple tillers of the land, but environmental guardians who are accountable both to their grandchildren and it would seem to Europeans and North Americans worried about climate change. Agriculture is now about an integrated set of production and post-harvest technologies and organisational arrangements that allow an industrialised food and commodity chain to operate effectively and deliver safe products. If this wasn't challenging enough agriculture has to keep everybody happy despite a global technological and economic trajectory aimed at consolidating power and resources at the expense of the poor and the environment.

HOW WELL PLACED IS AGRICULTURAL RESEARCH TO TACKLE THE LOOMING CRISIS IN SOUTH ASIA?

The stark answer is not very well! And this is not necessarily because South Asian countries lack scientific capacity. In fact, it's quite the opposite in India with its highly-developed agricultural science tradition.

The point of reference for many decisionmakers in South Asia is the Green Revolution and a success narrative, whereby plant breeding science was used to significantly increase rice and wheat production in South Asia. The other part of this narrative, however, is that the Green Revolution approach only worked in areas where water was abundant and input and output markets functioned — unlike the agriculture of the poor in marginal areas. The approach brought a set of second generation problems, including depletion of water tables, salt and alkalinity-affected soils and an erosion of biodiversity.

Many of the woes of the Green Revolution approach stemmed from the fact that research was used as a rather blunt, uni-dimension policy tool aimed at agricultural productivity. This organising principle — in combination with institutional arrangements that placed research at the supply end of a technology delivery pipeline — meant that research became disconnected from society and unresponsive to a widening agenda of poverty reduction, environmental protection and agricultural development.

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The mango case mentioned earlier is a classic example. Parts of coastal Andhra Pradesh have a mango-based rural economy with many livelihood opportunities for the poor linked to this. Farmer-owned companies and the private sector have been keen to export to Europe. However, despite the existence of a range of production and post-harvest research expertise in India, and despite the efforts of a number of agencies, the mango sector has not been able to mobilise and develop an operational export value chain. A poorly-developed tradition of partnering by key players in the sector, including researchers, has been a major stumbling block.

This story repeats itself in many different guises across South Asia: The under-researched crop and livestock species of the poor; the mixed fortunes of the shrimp exports from Bangladesh and vanilla from India; the low priority given to research on sustainable agriculture; the lack of scientific validation and support of farmers' own innovations; and the moribund and outdated agricultural extension services.

Despite the emergence of some research capacity in the private and NGO sector, the public sector will remain the main source of agricultural research across the region. However, these islands of isolated excellence in agricultural science will struggle to deal with the challenges the region now faces. There is an urgent need to find a way to better connect this expertise with the requirements of society and deploy it responsively to meet the changing set of challenges and opportunities that accompany participation in the global economic system.

POSITIVE DEVIANTS AND INNOVATIONS IN INNOVATION

The great paradox of South Asia is not so much that it has scientific capabilities and cannot make science count for development, but rather that it has such a rich experience of innovations in research and technology practice that its public research organisations could learn from, but don't.

In the value chain there are examples of Indian companies such as Reliance Industries establishing value added processing arrangements that mobilise technology and organise smallscale producers as a supply base for supermarkets. Coca Cola was able to establish a mango pulp-making value chain in the same Indian state discussed above. In Bangladesh, the

Grammeen Foundation has established a joint venture with the French food company Danone to produce fortified yogurt at affordable prices.

An NGO in Nepal, LiBIRD, has mastered plant breeding approaches that make best use of both scientific and farmers' local knowledge and have woven this into strategies to safeguard biodiversity. In Sri Lanka and India a new water-saving method of rice production with the potential to boost yields, known as Systems of Rice Intensification, has emerged and spread among an informal network of civil society and development organisations. And this has happened despite fierce opposition by the scientific community that has had difficulty validating and explaining these results.

Other research conducted by LINK on innovations in civil society has looked at: bio-mass fuelled spice and fish dyers; low-cost fishing boats; pineapple processes in a tie-up between self help groups and local companies, solar lighting service networks; marketing and design innovations linking weavers to high value markets, etc. All of these cases illustrate ways in which science and other information sources can be organised for innovation that is both economically viable but also poor. And this is just the tip of the iceberg of innovation in the region.

INNOVATION CAPACITY STRENGTHENING: HOW CAN IT BE TARGETED?

Firstly, while the general diagnosis of agricultural innovation capacity in the region is that there are weak links between science and the aspirations of society, it needs to be recognised that patterns of capacity are not uniform.



India has world-class scientific human resources and infrastructure. Those in Bangladesh and Nepal are much

weaker. Patterns of linkage and the degree of organisation in civil society are very high in Bangladesh, but this has yet to extend to research organisations. Research in Pakistan is better linked to the private sector, but has almost no connection to civil society initiatives that focus on the poor.

In order to target capacity strengthening initiatives it is useful to first categorise them. The accompanying figure presents a typology based on two considerations. First is the robustness of the agricultural science capacity (size, sophistication, skills). Science capacity is obviously required for problem-solving and opportunity-creating research. It is needed for absorptive purposes so that new technologies can be accessed and assimilated. It is also a prerequisite for participation in international scientific networks.

The second consideration is the extent to which institutional and policy change is allowing new ways of networking together scientific and other sources of knowledge relevant to emerging issues. As the figure below shows, some countries may have well-developed scientific capacity. Others may have well-developed institutional and policy arrangements. Until they have both, innovation capacity is unlikely to be strong in the South Asian countries.

● **Afghanistan and Nepal: Recovery from conflict/ starting from scratch:** Scientific capacity is low and institutional and policy change is also yet to take place. Afghanistan, with virtually no

research infrastructure, is in this category. Nepal historically had a relatively strong agricultural science capacity but is now faced with rebuilding this after a period of political transition, funding shortages and loss of trained manpower.

● **Pakistan and Sri Lanka: Transition from scientific capacity orientation:** Scientific capacity is high but institutional and policy changes are low. Pakistan is in this category although it is starting to change, as is Sri Lanka. India was in this category 5 to 10 years ago.

● **Bangladesh: Transition from social capacity orientation:** In this category there is still a need to build scientific capacity. However, institutional and policy changes, often as a result of patterns of social organisation associated with civil society activity, are starting to lay the foundations for innovation capacities with new architectures and forms of partnership. Bangladesh is firmly in this category and Nepal is moving toward this category.

● **India: Toward a responsive innovation architecture (sort of!):** In this category scientific excellence is well-networked into an evolving set of partnerships and, thus, has the innovation architectures needed to cope with the changing demands, opportunities and challenges that society faces. India is moving in this direction, although it is not quite there yet. It has a strong scientific capacity, and is making strenuous effects at re-orientating and reconnecting this with the rest of society

GIVEN THIS DIVERSITY WHAT THINGS COULD BE DONE?

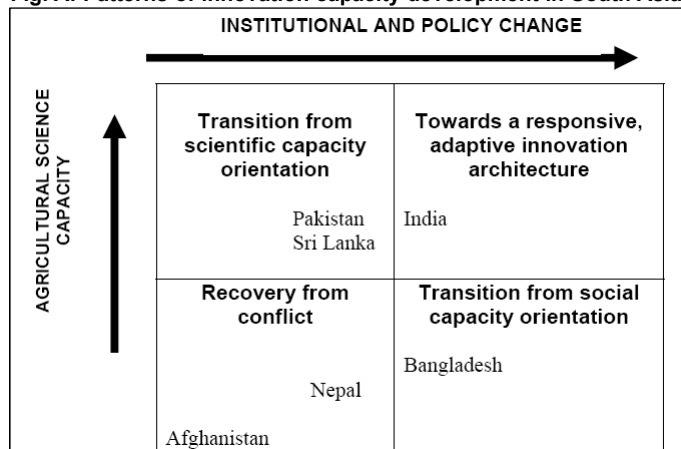
● **Build agricultural science capacity** only if and when it is needed. If it is needed, combine science capacity strengthening with measures that promote partnership and other innovations in research practice.

● **Revisit the contribution of the international agricultural research centres** to regional capacity development and find ways of strengthening their integration into national and regional operational and governance structures.

● **Create opportunities to promote lessons from civil society organisations** in innovation to public research practice. Do not just have workshops and meetings, but support joint activities that build on comparative strengths. Commission sector learning reviews and act on findings.

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Fig. A: Patterns of innovation capacity development in South Asia



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● **Broker a new deal with the private sector.** The private sector is still viewed with a high degree of suspicion by the scientific community. It will be a major client in the future and it is never too early to start building a tradition of partnering with it. The private sector can be encouraged to help reduce poverty but only if its incentive structures are known.

● **Exploit regional diversity for South-South wins.** India has high scientific capacities but lacks the social organisation and other institutional innovations of Bangladesh (rural banking) and Nepal (participatory conservation of biodiversity). Look for ways of deploying these different elements of innovation capacity to deal with issues of regional significance. Everybody has something to contribute.

● **Catalyse regional collaboration to multiply impact.** The four horsemen of the global economic system represent new organising principles for research and development practice. Identify opportunities where existing research and development practice could be “joined-up” and re-orientated towards these new themes to unleash synergy and multiple outcomes. For example, a regional consortium linking together all exciting works relevant to combating avian flu or climate change induced drought. If existing national and regional arrangements to facilitate this type of research and action collaboration do not work, scrap them and start again.

● **Promote North-South win-wins.** Shift from depending on Northern countries for altruistic development assistance and seek partnering

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KIT LAUNCHES RURAL INNOVATION DOSSIER

The Royal Tropical Institute (KIT) of The Netherlands has launched a Rural Innovations dossier, which is available online at <http://www.kit.nl/smartsite.shtml?ch=FAB&id=14577>. The KIT dossier is about the use of Rural Innovation Systems (RIS) as an analytical concept and a development tool, focusing on the contribution that the RIS approach can make to alleviating poverty.

KIT's dossier provides: (1) an overview of current insights, practice, and policy on RIS; (2) a discussion of the evolution of the RIS concept; and (3) an outline of KIT's Enhancing Rural Innovation programme.

opportunities with countries and companies that need South Asia and its poor more than South Asia needs their assistance. This could realign innovation incentives and be a way for South Asia to access global technology, particularly that which is held by the private sector.

FROM DOOM TO DELIVERANCE?

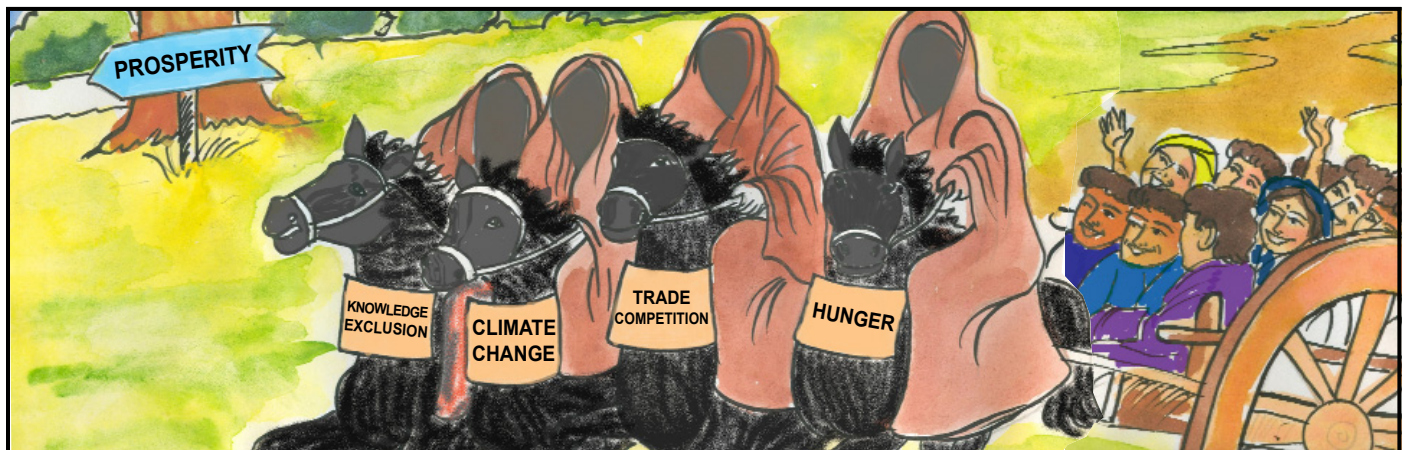
These measures could transform innovation capacities in the region. Collectively, the South Asian countries have the natural





resources, infrastructure, human capital and creativity to not only cope with the four horsemen of the global economic system, but also to harness them for the region's growth. Take food production and the example of the cross-border smuggling. Food policy reforms and sustainable productivity increases could turn the region into the food basket of Asia and beyond. And it is not just grain exports. A combination of high-value agricultural products such as spices, horticulture and livestock products combined with value added (and employment creating) processing could make the region a global food industry giant. It is already the world's biggest milk producer.

Climate change has few upsides, but if South Asia is able to cope as well or even better than its competitors then the region can use it to its advantage. Similarly the issue of access to global knowledge is not just about the specific benefits that this will give the region, but it is part of the bigger challenge of creating national and regional comparative advantages based on the ability to use knowledge and technology productively and competitively.

Can South Asia do it? There are certainly policy and political hurdles to be crossed if the institutional change prescriptions above are to be followed. However, the policy ambition in the region to do so does exist. The international community could play an important role making this ambition a reality, but it too needs to come to terms with what it means to enable agricultural innovation in a global economic system.

Discussions on this topic don't end here. To contribute your views, email us at info@innovationstudies.org.



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