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ANALYSIS

Innovating to prosper: Turning the 'new agriculture' into a sustainable growth industry

By Andy Hall

The agricultural sector of many of world's poorest developing countries is experiencing a largely unnoticed renaissance. This time it is not the international community that has intervened with high yielding crops to win the race to produce enough food to feed "the starving millions". Instead it is home-grown good news from countries like Bangladesh, Ethiopia, Kenya and Ghana. Here a mixture of entrepreneurial flair, far-sighted national planning and good old-fashioned luck and serendipity are creating a new type of dynamic agriculture notable for a diversity of products that includes cut flowers, shrimps, pineapples, medicinal herbs and processed foods.

Recent research at UNU Institute for New Technologies (UNU-INTECH) is exploring how countries can build on the vitality and dynamism of these New Agriculture sectors. The central question for farmers, processors and exporters finding themselves increasingly exposed to the turbulence of regional and international markets is how to innovate in order to cope, compete and survive. UNU-INTECH's research on this topic, which it is doing in collaboration with the World Bank, is focusing on how the capacity to innovate can be most effectively developed in ways that contribute to the poverty reduction and sustainability targets of the UN Millennium Development Goals.

Rapid growth

From practically a zero base 20 years ago, flower production in Kenya and Colombia, shrimp production in Bangladesh and horticulture in Ghana have all emerged to

become among the top export earners for their countries. This story is typical for a range of products as diverse as mangoes, herbal laxatives and Nile perch. While success is self evident, an explanation of how these New Agriculture sectors have achieved it and with such speed is not entirely clear. But what is common to all is a fortunate chain of events that put the right people in the right place when opportunities emerged.

Take the case of the food processing sector in Bangladesh. Ten years ago the Intermediate Technology Development Group, an NGO promoting food processing as an income generating activity for poor people, held a training course and as a venue used the garage of a retired army major. So inspired was the major that he set up a food processing business selling snack foods. Today, Pran Foods – the major's company – is the biggest in Bangladesh with a turnover in the millions of dollars.

But that's only half the story. The establishment of Pran Foods coincided with the explosive growth of the ready-made garments industry in Bangladesh. This attracted a veritable army of low paid workers and almost overnight created a whole new type of consumer – numbered in their hundreds of thousands – that needed convenience foods and for the first time had just enough cash to buy them.

In the Indian state of Kerala a number of farmers became interested in vanilla production. The reasons for this are obscure but it was probably because of vanilla's relative novelty in India and the farmers' curiosity. However, in the way that these things happen in farming communities, excitement about "the potential" of vanilla took on a momentum of its own – even at a time when the only way to make money out of vanilla was to sell it as planting material to other farmers who also wanted to get on to the vanilla bandwagon.

Knowledge about production techniques quickly spread through this farmer-to-farmer network. Within five years farmers had created a vibrant production base and local and international trading houses were starting to deal in Indian vanilla. When prices soared in 2000 because of a crop failure in Madagascar, the world's main vanilla producer, Kerala farmers were able to respond quickly, increasing production and entering the word vanilla sector as a major player.

These sorts of spontaneous events have played out around the world, be it large farmers with spare land experimenting with flower production in Colombia or Ghanaian entrepreneurs taking advantage of opportunities to export horticultural produce to Europe when the production by their neighbour and competitor Ivory Coast was disrupted by civil war. Farmers and entrepreneurs have begged and borrowed to get access to the technology, information and finance they needed to get started in these sectors. It has often been risky and the sectors can decline as rapidly as they boom. Despite that, New Agriculture seems to be taking hold in many of the world's poorest countries.

New agriculture and the poor

But is this just another skewed development pathway that will once again bypass the poor? It seems not. These rapidly growing sectors are creating a number of opportunities for poor people, but not in the old "small scale farmers are poor, let's help them" sort of way.

More than 80,000 women are employed in the cut flower industry in Kenya. Although there are concerns about their working conditions, the introduction of ethical and environmental standards by European markets is encouraging flower growers to provide a safe, non-exploitative working environment. The Intermediate Technology Development Group estimates that in a small Bangladeshi town the production and sale of snack foods by poor street vendors is worth US\$2 million.

In other cases farmers and small-scale processing enterprises get linked to large companies. In Ghana, Farmapine, a farmers' association, has created a network of small-scale pineapple farmers to produce export quality fruit for the European market. The shrimp industry in Bangladesh not only creates on-farm employment, it has also led to the creation of a large group of trained shrimp processing plant employees with sophisticated hygiene and food handling skills.

Dr. Nanam of Ghana's Food Research Institute explains that after a decade of researching new products to help poor cassava farmers, he realised that "if you want to help poor people you need to work with the rich. The rich are the industrialists who can develop new markets for the products made from the crops that the poor can produce." Dr Nanam has been working with the plywood industry to develop cassava-based glues and establishing supply chains to help link farmers to this new market for their crop.

Munzure Aziz from the Business Advisory Services Centre in Bangladesh makes a similar point about food process interventions. "There is an irony in the many development NGOs working on food processing that have ideological problems with the idea of profit and private enterprise. If we are ever going to help the poor we have got to start talking to the private sector and taking business seriously in the development sector."

A common feature across these sectors is the co-existence of both small- and large-scale producers. In Ghana there are both plantation-scale export pineapple producers as well as farmers growing less than an acre. In the horticultural export industry in Kenya, Zimbabwe and Zambia it is common for micro-scale farms to sell their roses or green beans to large commercial farms that have the links and quality systems to service European markets. In Bangladesh there are both large food processing companies like Pran Industries as well hundreds of thousands of one- or two-person enterprises making and selling snack foods. Of course all of these sectors are constantly changing and one fear is that the small-scale producers will be pushed out by larger ones with more resources.

Dr Mohammed Taher, a development specialist from Bangladesh, believes that crowding out of small-scale producers and processors is not inevitable and should not be advocated by development planners in pursuit of modernisation. "Ultimately it is a policy choice of whether or not to maintain the diversity of small and large players in these sectors," he says. "There is good reason to believe that this diversity will have important developmental outcomes in terms of poverty reduction and should be given the attention it deserves. Capabilities and incentives can be created to support the competitiveness and viability of the small-scale sector without damaging large-scale players."

Unfortunately, the failure to follow this advice is often as much a result of lack of political will as it is of fresh ideas on how to move ahead with such an approach.

Boom and bust, shocks and setbacks

Despite the impressive performance of these New Agricultural sectors, they are not without problems. At least three things can go wrong. The first is the volatility and competitiveness of international markets. World market prices change for many reasons. It may be that a major producing country has had good rains. Of course good prices encourage other countries to enter or increase production of a particular product and this can lower the world price. But it is also possible for one or more countries to lower production costs. This can result in uncertainty. Dr Rasheed Sulaiman, a technology policy specialist from the Indian Council of Agricultural Research worries about this cycle of boom and bust. "Will vanilla become the next cocoa?" he asks, referring to the collapse of the cocoa industry in his native Kerala.

The second major problem is that international markets and market regulations change. As Dr Ben Dadzie, a Ghanaian horticultural expert explains: "The European supermarkets decide what type of pineapples Ghanaian farmers produce. Right now they want a Costa Rican variety and if we don't find a way to switch quickly to this type we will be pushed out of the market." New regulations also hurt. In 1997 the European Union imposed a ban on shrimp imports from Bangladesh because of worries about hygiene standards. With support from the EU and others, the industry introduced Hazard Critical Control Point protocols to address the problem.

The third problem is pest attacks. This is typical of New Agriculture where crops or animals are introduced and over a number of seasons the pathogen load builds up. Once this happens, it spreads very rapidly through the intensive production system that farmers have usually adopted. With cut flowers it was fusairum, a fungal disease. With shrimp, it was a virus that discoloured the skin. With mangoes it was anthracnose, a fungal disease that produces black spots on ripe fruit.

Innovation preparedness

Initial findings from ongoing research at UNU-INTECH suggest that what happens with these sectors is that there is an initial period of rapid growth, usually relying on the technology and information held by farmers and firms. Research often makes negligible contributions in these early stages. Then at a certain point knowledge becomes limiting. A pest problem occurs or new standards emerge and have to be dealt with. It is at this point that farmers and firms find that their own knowledge and the networks that they rely on for information are inadequate. Often, what is needed to cope with these shocks is new networks or partnerships to access and share information and to jointly learn and solve problems.

Rose Kiggundu, a Ugandan technology policy specialist notes: "The only way Ugandan fish export firms survived the introduction of sanitary and phyto-sanitary regulations by the European Union was to start to talk to each other and work together to find a solution." Indian vanilla producers faced similar problems, said Dr Rasheed Sulaiman. "We have an agricultural university, we have a research centre on species, we have a spices promotion board, we have large international companies with extensive knowledge of the sector and we have knowledgeable farmers. But the communication between all of these is extremely limited. The main task to support vanilla is the integration of these different sources of knowledge." In Bangladesh, in contrast to the Ugandan fish processing sector, shrimp processing

companies do not exchange technical information, although they do work collectively for political lobbying.

It seems that this integration and the ability to form networks is crucial not just because of existing problems and shock, but because these shocks continue to occur. Take the example of shrimps in Bangladesh. First there is the European ban because of hygiene concerns, then there is an outbreak of a virus that discolours the shrimps, then there is an attempt to ban imports in the USA following the Tsunami disaster. As Dr Zahir Ahmed, a Bangladeshi anthropologist points out: "The sector is exposed to a continuously changing production, market, policy and regulatory environment. However much of the support to the sector has been fire-fighting technical assistance to solve problems, rather than create capacities to deal with future shocks."

Based on our analysis, the key to resolving these problems is to carry out four interrelated actions.

- First, making sure that there is a critical mass of technical skills in R&D organisations so that they can effectively trouble-shoot and problem-solve or act as a point of contact for accessing trouble-shooting technical expertise internationally and adapt this to local conditions.
- Second, there is need to build loose networks between farmers, industry, research, industry and policy. The idea is that when problems or new opportunities occur people know who can help. New alliances and knowledge networks can then be built quickly. Networks also act as an early warning system for approaching shock and emerging opportunities.
- Third, to avoid vanilla becoming the next cocoa, or the Tsunami ban becoming the European import ban, sectors need to learn lessons from the busts as well as the booms. This sort of *sector learning* could be used as a way of building up skills on how to deal with the inevitable volatility that is so characteristic of New Agriculture. This is a question of learning how to innovate and it is likely that it will have characteristics that are very specific to different countries and different commodities. The trick is to build up incrementally ways of doing things that work locally and suit local agendas.
- And fourth, policy needs to recognise that supporting the capacity to innovate includes supporting agricultural and allied research. But it also goes well beyond that. What is needed is the right clutch of policies that are locally relevant, encourage both the creation and productive use of knowledge and do so in ways that reduce poverty and protect the environment. No simple task.

The future of agriculture

But is New Agriculture just a stepping stone on the road to industrialisation as it was in North America and Europe? As an American Department of Agriculture official recently noted at conference on the future of world agriculture: "There are more people detained in prison in USA than working on the land." But surely this progression is far from certain for most of the poorest developing countries. Nor may it be desirable! The process of rapid industrialisation that took place in 19th Century Europe and North America was a unique event. That uniqueness resulted from certain historical sequences of events, physical endowments and particular modes of political, social and economic activity that allowed knowledge and technology to be put to use in ways that revolutionised society.

It goes without saying that these same conditions do not exist today in the poorest developing countries. Nor should they try to emulate them. These countries have their own uniqueness. As the experience of New Agriculture shows, this uniqueness is both the context and the creative well-spring that can bring about social and economic change. Development planners should recognise this and look for ways in which these creative capabilities can be further developed and nurtured. New Agriculture is certainly on the road to another stage of the development process – although it is impossible to specify what that stage might be. What is becoming clear, however, is that if the poorest countries are helped to create the capacity to innovate around self-selected growth poles like new agriculture they may yet get the chance to invent a future that best suits their national context.

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