

## **Alternative agricultural futures, futures past and present**

Although I was President of the local branch on a couple of occasions, I think this is my first presentation to it. In the past there was an honored tradition that the President would give a talk to the Branch when his tenure ended. However, I think I was in part responsible for breaking this tradition when I took over from Brian Johnston half-way through his term after he headed off to the US and was not able to give a talk. At any rate I am pleased to be here today to give this talk on alternative agricultural futures given some “new” realities of the global food system to the local branch.

### **IAASTD**

Before I talk about the recent workshop on “Exploring alternative futures for agricultural supply and demand, and food security”, I should give some background on how the research presented at the workshop evolved.

About three years ago an International Assessment of Agricultural Science Technology and Development (IAASTD) was commenced directed by Bob Watson of the World Bank who was previously Chair of the Intergovernmental Panel on Climate Change and Co-chair of the Millennium Ecosystem Assessment.

The IAASTD was an international effort to:

- evaluate the relevance, quality and effectiveness of agricultural knowledge, science and technology;
- the effectiveness of public and private sector policies in relation to agricultural knowledge, science and technology; as well as
- related institutional arrangements.

The key research question was:- “How can we reduce hunger and poverty, improve rural livelihoods, and facilitate equitable, environmentally, socially and economically sustainable development through the generation, access to, and use of agricultural knowledge, science and technology”.

Agricultural knowledge, science and technology were assessed in relation to meeting development and sustainability goals of:

- reducing hunger and poverty;
- improving nutrition, health and rural livelihoods; and
- facilitating social and environmental sustainability.

The exercise was co-sponsored by FAO, GEF, UNDP, UNEP, UNESCO, the World Bank and WHO (Note the absence of the WTO and relevant parts of the World Bank such as where Will Martin, Kym Anderson etc are undertaking research on the benefits of trade liberalisation in agriculture etc– apparently some funding from European interests would have been withdrawn if trade aspects were involved in the exercise and the research objectives reflect this even though trade is highly relevant to the development and sustainability goals). The IAASTD involved a consultative process with around 900 participants (including government, private sector (for a while) and so-called civil

societies (most identifiable as those that pushed their way to the front of the food queue which is probably why the private sector left)) and 100 countries.

The IAASTD did not aim to predict the future – however, it tried to create “plausible scenarios”, based on knowledge from past events and existing trends such as population growth (consistently over estimated), rural/urban food and poverty dynamics, loss of agricultural land, water availability and climate change effects. Based around these issues, “what if” questions were formulated that allowed the implications of different technological options to be explored and understood (within assumed positions on exogenous variables such as population growth and trade).

There was evidence at the outset that the exercise as it was structured was open to capture by vested interests. IFPRI was commissioned by ACIAR, along with ABARE, China’s CCAP and India’s NCAER, to undertake a separate fairly neutral plausible scenarios analysis exercise, including trade aspects, that could be drawn on by the IAASTD but also have independent outputs. This was a good approach as the quantitatives were downgraded in the IAASTD exercise when some vested interests were not happy with some of the general truths the quantitatives were portraying. “The great tragedy of science: the slaying of a beautiful hypothesis by an ugly fact – Huxley ‘. The workshop was about the separate ACIAR-funded exercise.

The outcome of IAASTD was presented following an Intergovernmental Plenary meeting in South Africa last April. A couple of key summary points from this meeting were:

- there should be more public funding of agricultural research with a focus on agro-ecological approaches (potential overstated cf GM); and despite trade being basically excluded in any proper assessment,
- that opening national markets to international competition ... can lead to long-term negative effects on poverty alleviation, food security and the environment without basic national institutions and infrastructure being in place (cf global supplies of food are adequate but need better quality food in the right places which presumably trade is one good way to address).

### **ACIAR workshop**

The ACIAR workshop on “Exploring alternative futures for agricultural supply and demand, and food security” examined the new realities of the global food system, presenting assessments of alternative futures for agricultural supply and demand, and food security to 2050, based on the ACIAR-funded research project designed to both inform the IAASTD initiative and to support independent analysis of agricultural futures. The workshop was attended by around 50 people from various organizations including ABARE, ACIAR, ANU, AusAID, CGIAR, Crawford Fund, CSIRO, DAFF, Defence, DFAT, ILRI, Melbourne University and the Treasury. Simon Hearn, ACIAR hosted the workshop and made some introductory and concluding comments drawing on the Malthusian debate. Alternative global scenarios for investment in agricultural research, water resources, and bio-fuels policy were examined (presented by Mark Rosegrant, IFPRI) along with trade scenarios (presented by Helal Ahammad, ABARE) plus country case studies assessing futures for China (presented by Yikun Huang, CCAP) and India

(presented by Mark Rosegrant). There were formal discussants from ANU (myself and David Vanzetti), La Trobe University (Sisara Jayasuriya) and the CIE (Tingsong Jiang).

Mark Rosegrant's presentation drew out the links between impoverishment, low productivity, increase land use and declines in research spending, as well as the uncertainty associated with future technology etc pathways because of uncertainties in the socio-political situation, eco-system health and technologies. Some of these latter uncertainties will be diminished by good quantitative analysis on possible future food markets with certain technologies being applied under specific situations. Future scenarios need to have some realism rather than appear like something from an interest group wish-list such as a reduction in meat demand given long-term trends in upward per capita consumption. Mention was made that markets can overlook equity, especially when there is a market failure, but that should not imply that markets should be distorted to address this issue which is generally best handled through taxation policies, social safety-nets, etc. Mark mentioned some "bad" policy responses to the current high commodity prices, namely export bans, import, production and middle-class subsidies, threatening of traders, and general macro policies. "Good" policy responses were to eliminate trade barriers and export bans, to expand aid for rural infrastructure, services and R&D, introduce safety nets, strengthen the tax base, and improve information and incentives. The World Bank/IMF have just announced a funding program that addresses many such responses, including insurance and futures market approaches. Leaving my discussion points for later as they cover a number of the sessions, there were a large number of questions and comments following Mark's presentation. One that stood out was about the decay in the effectiveness of technology etc which appeared to confuse a decay process associated with one technology etc with the real world situation of a continuum of investment that produces new technologies etc building off preceding ones which could even result in an increase in the effectiveness of the general technology in question.

Helal's presentation was on economy-wide validation of reference case assumptions and the gains from trade in a new context and incorporating R&D-trade dynamics. Trade liberalization led to increases in production which along with high prices were incentives for trade reform. David's comments were mainly on the modeling such as the importance of measuring the distribution of the productivity gains and the use of a "ruler" to estimate variations in scenarios. There were questions on the importance of the choice of Armington elasticities and the need for specific disaggregated country models to appropriately capture the gains from trade.

The presentation on India had some focus on gender differences that were thought could be due to the adjustment story. Sisira was fairly questioning of the inconsistency of some of the results which it was thought could be due to the absence of some dynamics in the model. There were some gender-related questions like on whether the technologies were labour intensive and the impact this might have on gender effects.

Jikun Huang's presentation covered two aspects, namely a review of agricultural performance in the past three decades in China, and a discussion of the impact of R&D

policy on agriculture and food security in China in 2020 and 2050. Jingsong in opening the discussion made a couple of important points, namely that two-way price information flows might be required in the international and national model linkages given China's position in world markets, and that the affordability of food is a more meaningful measure of food security than domestic production levels as a percentage of domestic demands. Some technology-related questions in this session concerned investment in roads opening up technologies, the type of technologies to assist smallholders, and the issue of importing IPR into China.

In my discussion opening comments on Mark's overview presentation I picked up a number of the key elements raised in the other sessions so I will focus on my comments in what follows. Science fiction often has a want of predicting an unpleasant future. When I think of the IAASTD exercise in this regard my mind is drawn to the "Hitchhikers Guide to the Universe", in particular the following quote: "Bethselamin is a fabulously beautiful place which attracts billions of tourists each year. Unsurprisingly, erosion is a primary concern of the local authorities. Their solution is to remove any net imbalance between the amount of matter eaten and the amount subsequently excreted through amputative surgery. Thus it is vitally important to get a receipt after every trip to the lavatory while on the planet."

This science fiction is about a self-sufficient world in terms of inputs and outputs, with no trade, and technology limited by the closed nature of this world – no need to measure food miles (separate of more important local production and other costs), and no risk of drought/disease-tolerant GM food being introduced here! It could be described as an agricultural anthropologic approach.

The ideas in the IAASTD exercise are not new as might be expected from the anthropologist link – in fact many of those involved are people that appear stuck in the past. "They spend their time looking forward to the past – Osborne". Lester Brown put forward similar ideas in his infamous "Who will feed China" work. Many reacted to this by showing China could feed itself, the work implying it could not and that the world could not as well so we needed to "amputate" population numbers etc. Better reactions supported by IFPRI, World Bank, etc analysis were that the world would help feed China. Hopefully the right areas of the World Bank – those that understand economics, and that saying free trade is bad is inconsistent with also saying trade bans are responsible for "worrying" high prices – will be undertaking similar analysis in relation to the IAASTD exercise.

The world helping to feed China would occur through opening up areas such as those that received support by being paid not to grow food when prices were low. Ironically at this point of time, some expensive environmental, bio-fuel and trade policies in developed countries were also aimed at pushing up agricultural prices, often justified on the basis of poorer farmers but favouring the richest farmers. Few economists have lost a bet that real commodity prices will return to normal downward long-term trends, reflecting productivity improvements, substitutes, trade etc maintaining supplies, as illustrated by

the non-Malthusian economist Julian Simon's bet with the author of the "Population Bomb", scientist Paul Ehrlich – and we call economics the dismal science!

China would fund its agricultural imports by supplying the world with cheap labour intensive "manufactures". These labour intensive manufactures should include processed foods like aquaculture prawns if they, along with apple juice etc, can get into world markets but that is what the WTO, the world agency that is best placed to comment on agricultural trade rather than a group that did not want to countenance the issue with any seriousness at the outset but somehow felt obliged to give some opinions at the end, and its dispute settlement is about. China has been more than self-sufficient in food for some time when the definition includes processed foods.

China along with other countries will ramp up its production with high prices, or lower prices and increased productivity increasing incomes if these are allowed to flow through to farmers. Developing countries' policies such as export bans and taxes have been aimed at keeping food prices to domestic consumers low, and agricultural producers have been further taxed by other policies such as relatively low infrastructure and research investment in rural areas. The IAASTD exercise said the poor have not been served by modern agricultural science and technology – it should be said it has probably been less well served by agricultural-related policies at the macro, micro and trade levels. General subsidies rather than targeted income support would fall into this category.

Unlike what is implied in the IAASTD exercise, increased agricultural production can be in conjunction with environmental improvement, apart from technology driven-yield increases taking pressure off increases in agricultural land. This has been shown in China where they have replaced unsustainable rice paddies, etc with commercial trees etc in Western China that has led to environmental improvements in terms of less dust storms, runoff etc, along with higher incomes. The IAASTD exercise stated that globalisation has accelerated the decline in natural capital but is the world's natural capital better off producing beef etc in Australia's extensive system or countries like Japan undertaking this intensively, assuming they can obtain the necessary inputs?

Unfortunately the Brown scare mongering spooked China into undertaking some expensive, excessive investment in storage and introducing some very inefficient policies focused on staples' production at any cost. The IAASTD exercise runs the same risk of imposing high costs through possible responses to its conclusions, especially in relation to trade and technology. "Bad" policy suggestions in respect of Australia have included regulate domestic fertiliser, chemical and feed inputs, and subsidise imports, slash petrol prices for the agricultural sector, introduce minimum floor prices, cease environmental flows and reinstate water allocations, and introduce tariffs on pork imports (CEC). Much of this sounds like the CAP which in an international context has also been suggested should be allowed to continue with its high production distorting ways.

The problem with Brown's approach is that it did not draw on quantitative approaches that took account of the dynamic responses to high prices etc such as mentioned above. Such scare mongering exercises do not welcome good quantitative analysis adding

rigorous assessment of what are often pre-determined bottom lines. It is no wonder some in the IAASTD exercise did not want to embrace the rigour of quantitative approaches that took into account resource constraints such as on land and water that would show some of the anthropologic approaches could not do all things like feed the world, drive its cars, preserve the environment, etc, and without trade-offs. I was involved in a BAE forecasting exercise in the late 1970s where forecasts from individual commodity models in a time of high prices required cattle with sheep on their backs in field of grain to have reflected reality. This was early days before multi-commodity and CGE models were established so we reconciled these aspects through the use of LP models that drew on the same IO structure used by CGE models.

I am pleased ACIAR funded the work covered in the workshop as an independent input available to the IAASTD exercise, and hope the research goes further in informing policy makers through their direct involvement of plausible futures, including trade and all possible technologies, that are supported by good quantitative analysis.

### **ACIAR Proposal**

Where to now on plausible futures? The IAASTD exercise disappeared from the media after a couple of busy days around its release and following some questioning responses, in particular on its poor treatment of trade and other economic issues, and its underplaying of the benefits of new technologies. However, a focus has been maintained on the underlying issues through the high world prices of food and the impact this is having on the poor in some developing countries. What was planned at the outset, and appears even more important now given the outcome of the IAASTD exercise and the current world food market, was individual country studies with analysis at the sub-country level and one such study has been developed for Indonesia.

The new Indonesian proposal is built around the development of quantitative tools that would enable Indonesian institutions with the assistance of IFPRI and Australian institutions (ANU and University of Adelaide) to develop a capacity to analyse policies, including those related to trade and short term policy needs within a longer-term framework. No relevant issues will be excluded on political economy grounds. There has been a demand at the highest levels of the Indonesian government for assistance in this area, for example on the possible impacts of climate change on Indonesian (agricultural) trade. Developing country agencies producing their own output for policy processes in the form of reports, policy briefs, workshops etc will assist in the implementation of better policies – reform from within. Steering committees made up of stakeholders in both Indonesia and Australia will also assist in the development of a policy relevant research agenda and the uptake of these policies. The structure of the Indonesian side of the project, involving both government agencies within the MoA and MoT with an academic institution in IPB, mimics the approach undertaken in Australia's IMPACT project which ensured policy relevance and sustainability of research resources through students working on maintained models, etc.

In conclusion, I think the workshop was important to address some of the muddled thinking that came out of the narrow IAASTD exercise such as the Malthusian mistakes

of ignoring the benefits of specialisation and trade, and productivity growth, as well as establish the need for continuing policy research on underlying issues such as better ways to overcome hunger and poverty, as well as sustainable development through more open trade. Trade-based price stabilization prevents large price increases and have been shown to provide greater benefits for the poor than safety net programs.