



**S. RAJARATNAM SCHOOL
OF INTERNATIONAL STUDIES**
A Graduate School of Nanyang Technological University

RSIS COMMENTARIES

RSIS Commentaries are intended to provide timely and, where appropriate, policy relevant background and analysis of contemporary developments. The views of the authors are their own and do not represent the official position of the S.Rajaratnam School of International Studies, NTU. These commentaries may be reproduced electronically or in print with prior permission from RSIS. Due recognition must be given to the author or authors and RSIS. Please email: RSISPublication@ntu.edu.sg or call (+65) 6790 6982 to speak to the Editor RSIS Commentaries, Yang Razali Kassim.

No. 86/2011 dated 1 June 2011

Asia's Food Security Conundrum

By Paul S. Teng, J. Jackson Ewing and Margarita Escaler

Synopsis

Feeding Asia's growing population requires modern agriculture based on the latest science and technology. Asian countries should embrace modern farming techniques and invest in R&D to develop sustainable food production systems.

Commentary

RECENT COMMENTS by the Prince of Wales at Georgetown University on food security have reignited a contentious debate: does sustainable food production require modern technology and inputs that affect the environment? It is important and timely to frame this debate against the backdrop of two recent announcements. The first was the Asian Development Bank's claim that more people will be driven into poverty because of spiralling food prices. The second was the United Nations' assertion that the world's population may exceed the nine billion projected by 2050 or even exceed 10 billion.

Over half the world's human population is now living in cities; in Asia at least 70% will live in cities by 2050. This demographic change underlies the importance of the nexus between growing food and sustaining the environment to support farming. Even with the best efforts from science, technology and land use planning, cities will not be able to produce many of the food items now commonly expected in modern societies.

Framing the issues

How will the additional billion mouths be fed given that most of these people will live in cities? How will food be grown when there will be fewer people farming and less land and water available for food production? It has been estimated that in the next 50 years, humankind will consume as much food as in the past 10,000 years. What will sustainable food production look like in Asia where the number of hungry mouths far exceed the entire population of the United Kingdom?

While the 1960's "Green Revolution" had in some areas led to environmental degradation, it also helped stave off mass starvation in Asia. The late Norman Borlaug, Nobel Peace Laureate in 1971, warned that if modern technologies are not used to maintain the crop yield increases, more forests would have to be cut down to produce enough food for the growing human population. There are about four billion more mouths to feed in the next 40 years, mainly from Asia. And that does not include the current one billion hungry people estimated by the World Bank!

Instead of knocking technology, the germane question to ask is what sustainability means in an Asian context? All farming involves environmental disturbance, but what kind of technology supports sustainable food production at an acceptable level of environmental impact?

Technology-based modern agriculture

Agriculture has been and will continue to require technological innovations. The early strains of today's modern staples were low-yielding and possessed many natural traits that made them difficult to harvest. Through a process of selection over the centuries, humans were able to gradually improve the strains of such crops. But it was not until the 20th Century when modern plant breeding techniques were introduced and strains with more manageable traits were developed.

These improvements meant that farming had become specialised and could be counted on, barring unexpected disasters, to feed growing populations. Some have classified the evolution of farming systems along a typology of feeding capacity. The "slash and burn" systems, still practised in parts of Kalimantan and among hill tribes in the Mekong sub-continent, can only feed single families. The intensive modern rice fields of Vietnam and Thailand, in which modern rice technology is employed, have enabled one farm family to produce enough rice to feed another 20-30 families.

This modern rice technology includes improved rice strains, fertiliser, pest and water management techniques. The International Rice Research Institute has calculated that it takes a rice farmer over 100 hours of ploughing a hectare of land with a caribou to get it ready for planting. Mechanisation has reduced this time, reduced the drudgery and has made life easier for small farmers.

The Paradox

Does the conundrum become a paradox? Rice fields are complex man-made agro- ecosystems. They can be managed in such a way that ecosystem services are protected without reducing the need for higher yields to feed growing populations. Environmental degradation is not the norm in modern farming despite what doomsayers claim. What modern societies need to do now is to continue improving the knowledge for sustainably managing human-created and human-managed ecosystems in agriculture. We do not have the luxury of going back to the pre-modernity norms of farming if we are to maintain the current living standards of the majority of people, and keep the price of basic food commodity items affordable.

Any significant move away from modern farming means that the food security of those living in cities will be threatened. This is especially so in the supply of foodstuffs which require countrysides to grow, such as rice and wheat. Countries like China and India have invested heavily in agricultural research; the irony is that biotechnology actually has the potential to produce the ideal organic crop strain if its detractors allow it to do so.

Addressing the conundrum in Asia

With more than 60% of the world's population and some of the fastest growing economies, Asia's food security issues are magnified in contrast to the Americas or Europe. Norman Borlaug was a strong advocate of using modern science and technology to increase food production. He had estimated that without an increase in farm productivity, an additional 1.6 billion hectares of arable land will be needed by 2050 to grow enough food.

This is clearly untenable. Deforestation and other land conversions in several Asian countries are already having significant negative consequences. The choice for Asian governments is to increase the investment in R&D. This will generate the knowledge and technology for producing more food from the same, if not, reduced land areas.

Paul Teng and J. Jackson Ewing are respectively, Professor & Senior Fellow, and Post-Doctoral Fellow, at the Centre for Non-Traditional Security Studies, S. Rajaratnam School of International Studies (RSIS), Nanyang Technological University. Marga Escaler is a Research Fellow of the National Institute of Education, Singapore.