



FOOD SECURITY EXPERT GROUP MEETING ON 'FOOD FIRST:  
ENSURING FOOD AND NUTRITION FOR URBANITES'  
4-5 August 2010

Organised by The RSIS Centre For Non-Traditional Security (NTS) Studies

CENTRE FOR  
NON-TRADITIONAL  
SECURITY STUDIES



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REPORT

ORGANISED BY  
THE RSIS CENTRE FOR NON-TRADITIONAL SECURITY (NTS) STUDIES

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## Executive Summary

Food security which is defined as ‘a situation that exists when all people, at all times, have physical, social and economic access to sufficient, safe and nutritious food that meets their dietary needs and food preferences for an active and healthy life’ has become one of this century’s key global challenges. In 2007 and 2008, increased food insecurity due to the dramatic rise in food prices led to a global crisis, causing political and economic instability and social unrest in many countries.

Food prices worldwide have risen since the beginning of this decade. By June 2008, prices had increased 83 per cent: the price of maize had tripled, wheat prices had increased by 127 per cent, and that of rice by 170 per cent. As a result, the number of people suffering from chronic hunger reached a historic high of 1.02 billion in 2009. The regional distribution of undernourishment was as follows:

- Asia and the Pacific – 642 million (63 per cent)
- Sub-Saharan Africa – 265 million (26 per cent)
- Latin America and the Caribbean – 53 million (5 per cent)
- Near East and North Africa – 42 million (4 per cent)
- Developed countries – 15 million (2 per cent)

The drivers of food insecurity included: the global financial crisis; population increase; changing and converging consumption patterns; increasing per capita income; growing demand for livestock products (meat and dairy products), particularly those fed on grain; growing demand for biofuels; increasing water and land scarcity; adverse impacts of climate change and the slowing of increases in agricultural productivity.

Although the global food situation improved in 2010 due to a more favourable economic environment and the fall in both international and domestic food prices, which was reflected in the number of undernourished people declining by 9.6 per cent in 2009 to 925 million people,

long-term food security remains uncertain. According to an annual joint report by the Organisation for Economic Co-operation and Development (OECD) and the Food and Agriculture Organization of the United Nations (FAO), agricultural commodity prices have fallen from their record peaks of 2007–2008 but are unlikely to drop back to the average levels of the past decade. The report predicted that average wheat and coarse grain prices over the next 10 years will increase 15–40 per cent in real terms compared to average levels in the period 1997–2006. Real prices for vegetable oils are expected to be more than 40 per cent higher whereas dairy prices are projected to be on average 16–45 per cent higher. Moreover, the United Nations (UN) projected that the world population will grow from 6.8 billion in 2009 to 9.1 billion in 2050. Feeding this larger and more urban population requires agricultural production to grow by 70 per cent. The future of global food security looks daunting. Securing future food supplies requires new, concerted and immediate international effort with a clear sense of the long-term challenges and possibilities.

In an effort to address this urgent issue, the RSIS Centre for Non-Traditional Security (NTS) Studies convened a two-day Food Security Expert Group Meeting on ‘Food First: Ensuring Food and Nutrition for Urbanites’ in Singapore on 4–5 August 2010. The objectives of the meeting were:

- to examine the context of ‘urban food security’ relative to global food security and rural food security
- to explore the development of an Association of Southeast Asian Nations (ASEAN) integrated food security management information system
- to assist in developing a research agenda on urban food security, including identifying potential projects and collaborators
- to identify possible roles for Singapore in the global food system

The Meeting was attended by experts, resource persons and participants from multilateral groups such as the World Food Programme (WFP), the Pacific Economic Cooperation Council (PECC) and the ASEAN Food Security Information System (AFSIS); bilateral groups such as the International Development Research Centre (IDRC); international and regional research institutions such as the International Food Policy Research Institute (IFPRI) and the Southeast Asian Regional Center for Graduate Study and Research in Agriculture (SEARCA); universities such as the National University of Singapore (NUS) and Nanyang Technological University (NTU); local and international agribusiness firms; and relevant Singapore government agencies.

This report presents a range of steps that governments, businesses, institutions and other stakeholders can take to tackle the challenges of food insecurity. In particular, it highlights ways in which urban food security can be improved and examines how food security information systems can help in securing the food systems in Southeast Asia.

### Urban Food Security

With more people now living in urban areas, there is a need for food security to be reconceptualised. Unlike rural dwellers, urbanites are net buyers of staples, they consume a wider variety of food and they are highly vulnerable to changes in the global market. There is thus a pressing need for urban areas to become food producers to feed the burgeoning urban population. Urban and peri-urban agriculture (UPA), defined as the growing of plants and the raising of animals within and around cities, offers a way to improve urban food security. Urbanisation is another sustainable approach aimed at feeding the urban masses. As no country can claim to be fully self-sufficient in all food commodities, agribusiness firms which facilitate the movement of food across regions and countries are also a crucial component of urban food security. Besides these approaches, the following areas of interventions were identified:

- Major emphasis has to be given to **early warning systems**. They could track changes in food security conditions in urban areas, thus allowing for the shaping of effective responses.
- **Peace, order and stability** are essential elements of food security. During conflicts, food production is usually reduced, and in some cases it collapses, leading to hunger and starvation.
- Governments must institute strict **land-use planning** mechanisms aimed at preserving and protecting prime agricultural lands.
- **Technology transfers** can help countries with limited capacities establish mechanisms to analyse threats and risks within their food systems.
- **Public awareness** on nutrition and diet should be promoted.
- **Food-based safety net programmes** which provide adequate food for consumption and help poor consumers achieve and maintain better nutritional status should be instituted. In the absence of such intervention, the poor would likely curtail their food consumption, resulting in malnutrition, disease and possibly death. Improvements in existing food-based safety net programmes are thus essential.

Singapore can also contribute to regional urban food security in a big way. Specific areas where Singapore has a competitive advantage are as follows:

- Singapore can facilitate and inspire technology transfers, best practices, business models, etc. In other words, it can act as a regional **knowledge hub**.
- With food safety increasingly becoming a major policy concern, the relevant Singaporean government agency (or agencies) can act as a referral point for the setting of food safety standards in Southeast Asia. In other words, Singapore can serve as the **food safety standards setting hub** for Southeast Asia.
- Singapore can capitalise on its position as a leading global financial centre to attract funds and investment. In other words, it can play the role of an agricultural investment and **financial hub**.
- Singapore's efficient port and logistics can help position the country as a **logistics hub** for the agricultural sector in Southeast Asia.

## Food Security Information Systems

The overall objective of food security information systems is to strengthen food security through the systematic collection, analysis and dissemination of food security related information in order to better manage policies and programmes. The first pillar is the establishment of a minimum set of core data that countries will collect to meet current and emerging demands. A food security information system also enables the monitoring of changes in food security conditions. In particular, it provides advanced notice of a deterioration of a situation. Although the AFSIS does a commendable job in data compilation, its full capacity has yet to be realised. The following areas of improvements will enable the AFSIS to become more effective:

### Usage of Data

- The AFSIS website must be **user-friendly**, interactive and up-to-date.
- The database must include **relevant information** on food production; policies; statistics; studies and projects; global market information on, for instance, seed, fertiliser and equipment; best management practices, etc.
- The data should be able to provide **early warning and forecasting** of changes in food systems. An early warning system is an essential management tool for safeguarding and improving food security. An effective early warning system provides sufficient lead time between prognosis and the actual occurrence of food shortages or surpluses, and enables the government to deal effectively with sudden or chronic food crises, on the one hand, and ensure supply-demand balance through necessary intervention in the market on the other.
- Users must be **trained** or **informed** on ways to make better use of data available within the website.

### Data Collection

- A **conceptual framework** that brings together the economic, environmental and social dimensions of agriculture and the cause-and-effect relationships that connect them is essential.
- Improving data collection methodology requires **capacity building**.
- **Technical assistance** should be provided to countries with limited technical expertise.
- **New sources** of data should be explored.
- There is a need to improve **data input**.
- Efforts should be made to **expand communication and networking channels** with key stakeholders.
- Data should be fed into the AFSIS website on a regular basis and it must also be **updated regularly**.
- **Funding** for the AFSIS project has to be pursued vigorously.

### Data Processing

- **Tools** for better data processing such as human and technical resources should be enhanced.
- Steps have to be taken to ensure that data fed into the database are of **good quality**.
- **Analysis** and assessment of food situations and trends should be enhanced through the use of food security indicators and better statistical tools.

### Data Dissemination

- There is a need to **identify and locate users** through, for example, efforts to create distribution lists.
- Multiple **methods of dissemination** should be explored, including seminars, monthly/quarterly bulletins, email alerts, annual reports, etc.

## Opening Remarks

*Ambassador Barry Desker*

*Dean,*

*S. Rajaratnam School of International Studies (RSIS),*

*Nanyang Technological University,*

*Singapore*

Ambassador Barry Desker welcomed all participants to the Food Security Expert Group Meeting on behalf of the RSIS Centre for Non-Traditional Security (NTS) Studies. Food security, according to Ambassador Desker, has become one of this century's key global challenges. He cited the 2007–2008 world food crisis when food prices reached their highest levels since the 1970s as proof that the era of cheap food has become a thing of the past. The skyrocketing cost of staple grains and edible oils triggered riots across the globe, particularly in the teeming, impoverished cities of the developing world, where many spend up to 75 per cent of their incomes on food.

In response to this crisis, food-exporting countries imposed bans on exports, exacerbating food insecurity in importing countries. As a result of the food price rise and the global economic slowdown of 2008–2009, the number of people who go hungry reached a historic high of 1.2 billion in 2009. Of that number, 642 million live in the Asia-Pacific region. One consequence of rising food insecurity is the phenomenon of capital-rich but resource-poor countries leasing land from capital-starved but resource-rich countries. Whether or not this contributes to food security remains to be seen.

Ambassador Desker presented a stark vision of global food security. He stated that the world's population is projected to reach 9.1 billion in 2050, 34 per cent higher than today. Nearly all of this increase will occur in developing

countries. Urbanisation will continue at an accelerated pace with about 70 per cent of the world's population expected to live in urban areas by 2050 compared to 49 per cent today. As a result, food production must increase by 70 per cent. However, Ambassador Desker cautioned against attempts to increase food production at all costs and urged participants to seriously consider the impacts of climate change and the growing scarcity of water and land.

Ambassador Desker noted that the Meeting will focus specifically on urban food security because more people will be living in urban areas in the coming years. Urban food security, he pointed out, is already a major concern for small, highly urbanised countries like Singapore which imports more than 90 per cent of its food requirements due to its size limitations. Over-reliance on imports however is risky given the volatile nature of global food markets. In its quest to ensure a resilient supply of safe food and mitigate the impact of rising food prices, Singapore has stepped up its efforts to diversify and approve new sources of food. To that end, it set up a Food Fund in December 2009 in order to, among others, support food diversification by establishing new and stable sources of food supply, and support food capability development in order to maximise local farm productivity.

Ambassador Desker expressed the hope that the two-day Meeting will provide participants with a valuable opportunity to exchange ideas and expertise on how best to achieve urban food security in an age of constraints. In conclusion, he wished all distinguished participants a fruitful time and a stimulating discussion.

## Session I: Urban Food Security

Traditionally, the concept of food security and the practice of agriculture were associated with rural contexts. However, with more people now living in urban areas, food security has become an urban concern. Urban centres have to strive to become food producers, and not just food consumers. Urban agriculture can help cities achieve self-sufficiency in at least some of the key food products consumed by their inhabitants. In order to explore ways to improve urban food security, this session discussed the following issues:

- framing the concept of urban food security
- urban and peri-urban agriculture (UPA)
- urbanisation to bridge rural-urban expectations and needs
- the role of global food supply chains and agribusiness

### Framing the Concept of Urban Food Security

The world currently faces the enormous challenge of feeding the projected 9 billion people by 2050. This would mean Africa has to increase its food production by 300 per cent, Latin America by 80 per cent and Asia by 70 per cent. It was observed that food security as a concept originated in the mid-1970s during a global food crisis. The initial focus was primarily on food supply problems – of assuring the availability and to some degree the price stability of basic foodstuffs at the international and national levels. As such, food security was defined in the 1974 World Food Summit as: ‘availability at all times of adequate world food supplies of basic foodstuffs to sustain a steady expansion of food consumption and to offset fluctuations in production and prices’.

### The evolution of the concept of food security

In 1983, the Food and Agriculture Organization of the United Nations (FAO) expanded the concept to include access of vulnerable populations to food – ‘ensuring that all people at all times have both physical and economic access to the basic food that they need’ – implying that attention should be balanced between the demand and supply sides of the food security equation.

In 1986, the highly influential World Bank report *Poverty and Hunger* introduced the widely accepted distinction between chronic food insecurity, associated with problems of continuing or structural poverty and low incomes, and transitory food insecurity, which involved periods of intensified pressure caused by natural disasters, economic collapse or conflict. This conceptualisation of food security is further elaborated in terms of ‘access of all people at all times to enough food for an active, healthy life’.

The 1996 World Food Summit adopted a still more complex definition: ‘Food security, at the individual, household, national, regional and global levels [is achieved] when all people, at all times, have physical and economic access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life’.

In an FAO report titled *The State of Food Insecurity in the World 2001*, the definition is further refined as: ‘Food security [is] a situation that exists when all people, at all times, have physical, social and economic access to sufficient, safe and nutritious food that meets their dietary needs and food preferences for an active and healthy life’. Alternatively, ‘food insecurity exists when people do not have adequate physical, social or economic access to food as defined above’.

## Types of food insecurity

### *Transitory food insecurity*

Transitory food insecurity is short-term and temporary. It occurs when there is a sudden drop in the ability to produce or access enough food to maintain good nutritional status. It results from short-term shocks and fluctuations in food availability and food access, including year-to-year variations in domestic food production, food prices and household incomes. Transitory food insecurity is relatively unpredictable and can emerge suddenly. This makes planning and programming more difficult and requires different capacities and types of intervention, including early warning capacity and safety net programmes.

### *Chronic food insecurity*

Chronic food insecurity is long-term or persistent. It occurs when people are unable to meet their minimum food requirements over a sustained period of time. It results from extended periods of poverty, lack of assets and inadequate access to productive or financial resources. It can be overcome through long-term development measures to address poverty.

## Ensuring urban food security

Urban food security is increasingly a major policy concern. This is because 50 per cent of the world's population now live in cities, with the figure expected

to increase to 70 per cent by 2050. The increase in urban populations has prompted the reconceptualisation of food security. Urban dwellers buy most of their food; have a higher consumption of meat, dairy products, fruits, vegetables and processed foods; eat a wider variety of foods; and are more vulnerable to changes in the global market. In the urban context, supermarket chains are stakeholders with control over access and high food prices have greater adverse effects. It is estimated that 800 million people are involved in urban agriculture. It is further observed that low-income urban dwellers spend 40–60 per cent of their income on food per year. Urban food security could be affected by the following:

- mid- to long-term trends such as demographic changes; changes in demand for food; investments in food entrepreneurship; production and farmer-unfriendly policies; changes in the climate and natural resource base; and the declining number of farmers
- immediate trends such as disruptions to supply, spiralling input costs and alternative uses of biomass

Singapore offers an interesting case study with regard to the application of techniques to ensure urban food security. Due to limited land, Singapore depends primarily on imports. Local farming accounts for only 23 per cent of eggs, 4 per cent of fish, and 7 per cent of leafy vegetables consumed in Singapore. A large proportion (more than 90 per cent) of the food requirement is therefore sourced from other countries, with several products sourced from only one or two supplier countries.

Table 1: Sources of selected food products

Food products	Types and Suppliers
Pork	<ul style="list-style-type: none"> <li>• Live – 100% imported from Indonesia</li> <li>• Chilled – 23% imported (of which 99% is imported from Australia)</li> <li>• Frozen – 57% imported (of which 60% is imported from Brazil)</li> </ul>
Chicken	<ul style="list-style-type: none"> <li>• Fresh – 37% imported (100% from Malaysia)</li> <li>• Frozen – 63% imported (of which 84% is imported from Brazil)</li> </ul>
Eggs	<ul style="list-style-type: none"> <li>• 73% imported from Malaysia; 27% supplied by local farms</li> </ul>
Vegetables	<ul style="list-style-type: none"> <li>• 74% imported from two sources: Malaysia (46%) and China (28%)</li> </ul>

To reduce its over-reliance on imports, Singapore has undertaken steps to increase its production capacity to 30 per cent of eggs, 15 per cent of fish and 10 per cent of leafy vegetables consumed in the country. It hopes to achieve this through intensive UPA. In Singapore, the practice of UPA involves the application of technologies and innovations such as aeroponics (the growing of plants without soil and water), fish breeding, city gardens, agrotech parks and post-harvest technologies.

Increasing collaboration with its hinterlands will also further strengthen Singapore's food security. Hinterland in the context of Singapore can be thought of as comprising four layers: the peri-urban areas in and around Singapore; the immediate neighbouring countries such as Malaysia and Indonesia; the wider ASEAN and Asian region; and finally, the global supply chain. Singapore can engage with farmers in its hinterlands to help improve their farm productivity. It can also facilitate the development of new supply sources through the establishment of food zones in other countries.

### Urban and Peri-urban Agriculture (UPA)

UPA refers to comprehensive agro-economic activities in urban and peri-urban areas. It encompasses agro-production, processing, distribution, consumption and leisure experiences. In short, UPA is the growing of plants and the raising of animals within and around cities, and the socioeconomic activities associated with that.

UPA is already practised in a number of cities around the world. It supplies 80 per cent of Hanoi's fresh vegetable requirements; 50 per cent of its pork, poultry and freshwater fish requirements; and 40 per cent of its egg requirements. Shanghai also produces 60 per cent of its vegetables, 100 per cent of its milk, 90 per cent of its eggs, and 50 per cent of its pork and poultry meat requirements through UPA. Dakar supplies 60 per cent of Senegal's vegetables requirements and its urban poultry production supplies 65 per cent of the national demand.

The most striking feature of UPA which distinguishes it from rural agriculture is that it is integrated into the urban economic system. UPA is also embedded in – and interacts with – the urban ecosystem. These economic and ecological linkages include: the use of urban residents as labourers, the use of typical urban resources (for instance, the use of organic waste as compost and urban wastewater for irrigation), direct links with urban consumers, direct impacts on urban ecology (positive and negative), competition for land with other urban functions, its activities being influenced by urban policies and plans, etc. An estimated 800 million people are now involved in urban agriculture and contribute to feeding urban residents. Of these, 200 million produce for the market and 150 million work full-time.

UPA is multi-functional and helps address key urban challenges in a number of ways:

- It helps in the development of an 'ecological city' through the greening of urban areas, the productive use of urban wastes, the reduction of the urban ecological footprint, the improving of the urban micro-climate and the preservation of biodiversity.
- It creates socially inclusive cities by encouraging subsistence-oriented urban agriculture. Benefits include poverty alleviation, the provision of social safety nets to the most vulnerable, the promotion of community building, the mitigation of HIV/AIDS and the strengthening of urban-rural linkages.
- It contributes towards the economic development of cities and makes them more productive through income generation and employment; UPA also leads to the development of enterprises and market chains.

While UPA has many functions, its core function remains increasing food production in order to improve food security in urban areas, through the effective use of resources and the application of innovative technologies.

### **Trends in the evolution of UPA**

Due to its multi-functional characteristics, the practice of UPA has become an important policy agenda in cities around the world. Trends seen in the evolution of UPA include the following:

#### *100 miles food supply*

The '100 miles food supply' movement is an exploration in sustainable living. The movement specifies that an individual should go no further away than 100 miles to gather the food he or she needs. Also called the 'local-food movement', it uses food miles (or kilometres) to specify the distance food travels from farm to plate. The movement encourages local food production and the consumption of fresh foods, which would at the same time save energy, reduce the carbon footprint, improve the environment as well as enhance community harmony among urban residents and develop social responsibility.

#### *Edible landscape*

Edible landscaping recognises that an aesthetically pleasing landscape and the production of fresh, delicious food can go hand-in-hand. In other words, edible landscaping involves the cultivating of plants which not only enhances the landscape but is also a source of food. Edible landscaping has enjoyed a resurgence since the 1980s due to the growing recognition of the health, environmental and other benefits of locally grown food.

#### *Agroparks*

An agropark is essentially a regional cluster of agribusinesses in which plant and animal production and processing chains are integrated with other functions of society. They include businesses in the following sectors: the food and non-food industry; energy, water and waste management; education and training; recreation and leisure; trade, logistics and transport; and spatial planning. Agroparks are dedicated to integrating chains of

production and processing and closing cycles of material flow. They provide an answer to the question of how to restructure and innovate existing agricultural practices in order to comply with the demands of sustainable growth and consumption.

Agroparks contribute to sustainable development in the following ways: the lowering of emissions and waste; the mutual use of waste and its by-products; advantages of scale through industrial production and processing; reduced dependence on fossil fuel; significant reduction of economic costs, etc. Agroparks offer higher quantity and quality of food to increasing numbers of people living in urban areas while reducing environmental strain and improving sustainability.

### **Current developments in UPA**

The development of UPA in developed countries is promising, with the introduction of high value-added agricultural practices, the promotion of the 'garden city' concept, the expansion of community gardens and rooftop planting, and the use of UPA to promote environmental sustainability. In developing countries, however, the development of UPA is less pronounced. Nevertheless, its potential for growth remains strong. UPA in developing countries could help reduce poverty, improve nutrition and diet, generate income and help protect the environment.

China has recognised the importance of UPA in improving food security and has made it a priority. In China, UPA projects were initiated by the government, with the actual operationalisation entrusted to companies and cooperatives. UPA in China focused on areas such as the development of seeds, agricultural exports, technology, food processing, agro-tourism, logistics, recycling, agroparks, etc. Although the objectives behind the promotion of UPA are the same, each of the cities in China has its own innovative approaches and practices, as demonstrated by the following examples:

*Beijing 2-2-1 Action Programme on Urban Agriculture*

This comprehensive programme was initiated by the Beijing municipal government in April 2004 with the objective of creating a multi-functional recreational agricultural area in the peri-urban zones of Beijing. Specifically, the programme aims to maximise resource utilisation and the market, mobilise the supportive inputs of capital and technology, and facilitate the creation of an information platform for sharing agro-technologies and experiences.

*Shanghai Sunqiao Modern Agricultural Development Zone*

Built in 1994, the Shanghai Sunqiao Modern Agricultural Development Zone aims to speed up the integration of city and villages through agricultural industrialisation.

*Chengdu agro-tourism*

This initiative promotes rural agro-tourism (also called leisure agriculture and sightseeing agriculture). Chengdu is one of the pioneering cities in China in the development of agro-tourism. Tourists from urban areas in Chengdu go to farmers' homes and stay over the weekend, eating country food and enjoying nature. This has significantly increased local rural households' annual income, thereby improving the overall quality of Chengdu's rural environment.

## **Rurbanisation to Bridge Rural-Urban Expectations and Needs**

In Asia's dash towards urbanisation, the countryside has been forgotten. The current growth model, which defines well-being and human security in terms of the satisfaction of material desire and consumption, has been increasingly criticised due to its potential for causing environmental destruction. Given the evident environmental impact that development has had on the global ecosystem and the devastating impacts of climate change, there is a need to rethink the development agenda and the relationship between the urban areas and the countryside.

Rurbanisation attempts to reconceptualise the current developmental model and the 'destructive' lifestyle of over-production and -consumption. Specifically, the objective of rurbanisation is to address the existing rural-urban dichotomy. It considers the current conceptualisation of the rural and the urban as two spaces to be a mistake and argues for the rural and the urban to be viewed as a single space, hence the term 'rurbanisation'.

A rurban settlement is typically relatively self-contained, comprising a 1-kilometre diameter settlement surrounded by vegetable and fruit farms with various crop plantations further away. In terms of the role of rurbanisation in promoting urban food security, it was argued that rurbanisation can help achieve food self-sufficiency in urban areas. Rurban communities produce their own energy and food and command a price for their produce.

Every rurban settlement will be relatively energy autonomous using renewable energy technologies. Water, sewerage and waste recycling are essential components of the rurban economy. The use of local building materials increases the recycling of capital within the rurban economy, thereby stimulating the evolution of local technology and entrepreneurship. Rurbanisation however does not dismiss the role of cities. Cities will continue to serve the following four key functions, that is, centre for top medical research and treatment; centre for the highest levels of academic research and teaching; centre for the best in media, arts, content development and entertainment; and centre for material culture and shopping.

With the four core functions located in urban areas, all other functions of society and the economy can be dispersed in the countryside. The landscape that will eventually arise out of rurbanisation will be like a living web spread over valleys and waterways, co-existing with farms, plantations and forests. The web will be punctuated by clusters for education, entertainment and manufacturing. Every settlement will be high density but low rise. Spatial efficiency will be tied to convenience. Bicycles, bio-diesel buses and walking paths will animate the community spaces and facilities. A simple analysis of available land space suggests the feasibility of such a vision.

Rurbanisation has attracted increasing attention, with various countries considering the possibility of adopting the concept. Theoretically, the entire Singaporean population could be re-housed in 200 rurban settlements with farms located in between. Plans are underway to implement the concept in Vietnam. Indonesia has also adapted rurbanisation into its national planning (under its Rural Intervention Model in November 2009). Despite this interest, the progress in Asia is slow because most countries are still focused on an urban-centric model of development.

## The Role of Global Food Supply Chains and Agribusiness

No country or region is self-sufficient in all food commodities. Countries rely on the global food supply chains to sell surplus food commodities and most importantly, to buy those food commodities that they themselves do not produce. ASEAN presents an interesting case. On the one hand, ASEAN countries boast surplus production in rice, fish, fruit, sugar and vegetable oil, and on the other hand, they have a deficit in maize, meat, dairy products and vegetables. On the whole, ASEAN is both a net food exporter as well as an importer.

Table 2: World food basket – key exporters

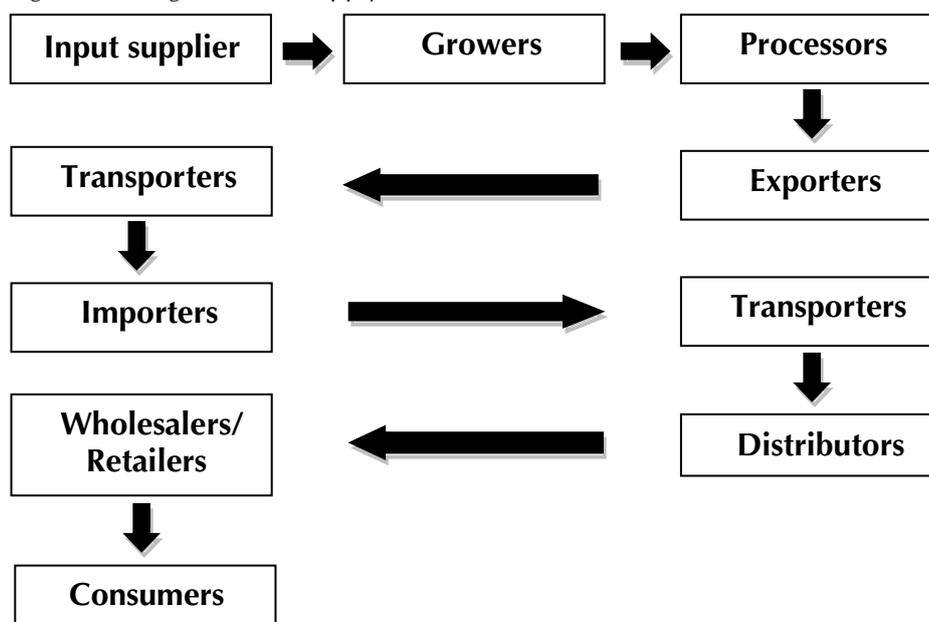
Country/region	Products
US	Wheat, maize, soybean, rice, chicken, beef, pork
Brazil	Soybean, sugar, coffee, chicken, beef, pork
Argentina	Wheat, maize, soybean, soybean oil, beef
Canada	Wheat, canola oil, pork
European Union	Wheat, pork, dairy
New Zealand	Fruits, beef, lamb, dairy
Australia	Wheat, sugar, fruits, beef, dairy
Thailand	Rice, sugar, fruits, maize, chicken, canned tuna, shrimps
Indonesia	Palm oil, coffee, shrimps, canned tuna
Malaysia	Palm oil, fruits
Vietnam	Rice, coffee, fruits, shrimps, catfish
Philippines	Coconut oil, fruits, tuna
China	Apples, tangerines, chicken, pork, shrimps, tilapia

Agribusiness firms facilitate the movements of food commodities from one country to another. Agribusiness includes the sum total of all operations involved in the manufacture and distribution of farm supplies; production operations on the farm; and the storage, processing and distribution of farm commodities and items. Specifically, agribusiness is made up of: genetic and seedstock firms; input suppliers; agricultural producers; merchandisers or first handlers; processors; retailers and consumers. The food and agribusiness system is the largest sector in the world economy representing 50 per cent of global assets, 50 per cent of the global labour force and 50 per cent of global consumer expenditures.

logistics providers to transport the food either directly to the food processor or indirectly through storage and marketing via a cooperative group or consolidator. The involvement of the farmer stops at the processor and does not extend down to the customer or even the distributor. A simplified version of the food supply chain, illustrating the number of entities involved in the process, is presented in Figure 1.

The global food supply chain helps ensure food security in the following ways: it consolidates production from multiple sources; it helps to boost the yields of small farmers; it invests in sophisticated and reliable logistic

Figure 1: The global food supply chain



The global food supply chain facilitates the movements of food commodities across countries and regions. A supply chain is a network of facilities and distribution channels that includes the procurement of materials, production and assembly, and delivery of product or service to the customer. Agribusinesses produce and distribute food and agricultural products to the final consumer and this involves production, processing and supply. Broadly speaking, the global food supply chain starts with a farmer using farm supplies such as machinery, seeds, fertilisers, pesticides, etc. The farmers then use

facilities; it supplies quality foods; it invests in research and development; and it shares valuable information on supply chain management. At present, firms belonging to the US and the European Union dominate all levels of the global food industry, as suppliers, breeders and producers; in the areas of animal health, fertiliser, farm machinery and packaging; as commodity and packaged food firms; as retailers and food service providers; and as logistics providers. An overview of the major global agribusiness firms arranged in order of their scale and size is presented in Table 3.

As the food supply chains become increasingly global, the inherent risk arising from disruptions in supply, lack of traceability and limited accountability has brought supply chain risk management to the fore. Supply chain risks include those arising from the problems of coordinating supply and demand on the one hand, and those arising from disruptions to normal activities on the other. It is therefore important to safeguard supply chains in order to stabilise the global food market. Measures to safeguard supply chains include eliminating

trade barriers; preventing and deterring terrorist/pirate attacks on the supply chain (shipping, shipping lanes); sharing best practices in post-harvest and storage management; integrating more farmers into the global supply chain; investing in countries with high agriculture potential such as Cambodia, Vietnam, Myanmar and Lao PDR; addressing the potential for biological risks and epidemics in Southeast Asia; and increasing public research and development spending for agriculture and food production.

Table 3: Major global agribusiness firms

	<b>Firms</b>
<b>Crop protection and seeds providers</b>	Monsanto–US, Bayer Crop Science–Germany, Syngenta–Switzerland, DuPont (Agri)–US, BASF (Agri)–Germany
<b>Primary breeders</b>	<i>Broilers:</i> Aviagen (EW Group)–Germany, Cobb–Vantress (Tyson Foods)–US <i>Layers:</i> Hendrix Genetics–Netherlands, Groupe Grimaud–France <i>Swine:</i> Genus–UK, Hendrix Genetics–Netherlands, Topigs–Netherlands, ACMC–UK <i>Cattle:</i> Genus–UK, IGL–Canada <i>Fish:</i> Aqua Gen (EW Group)–Germany
<b>Fertiliser companies</b>	Yara–Norway, Agrium–Canada, Mosaic–US, PotashCorp–Canada, OCP Group–Morocco
<b>Farm machinery supplies</b>	Deere & Company–US, CNH Global–US, Kubota Corporation–Japan, AGCO Corp–US
<b>Packaging firms</b>	Tetra Park–Sweden, Amcor–Australia, Owens-Illinois–US, Rexam–UK, Ball Corporation–US
<b>Commodity firms</b>	Cargill–US, ADM–US, Bunge–Bahamas, Continental Grain–Belgium, Wilmar International–Singapore
<b>Global packaged food companies</b>	Nestlé SA–Switzerland, Cargill–US, Unilever–UK/Netherlands, Kraft Foods–US, Tyson Foods–US
<b>Global retailers</b>	Walmart–US, Carrefour–France, Metro–Germany, Tesco–UK, Kroger–US
<b>Food service providers</b>	<i>Food service:</i> Sysco Corporation–US, Compass Group–UK, US Foodservice–US, Aramark–US <i>Quick-service restaurant:</i> McDonald’s–US, Yums! Brands–US, Burger King–US, Wendy’s/Arby’s–US

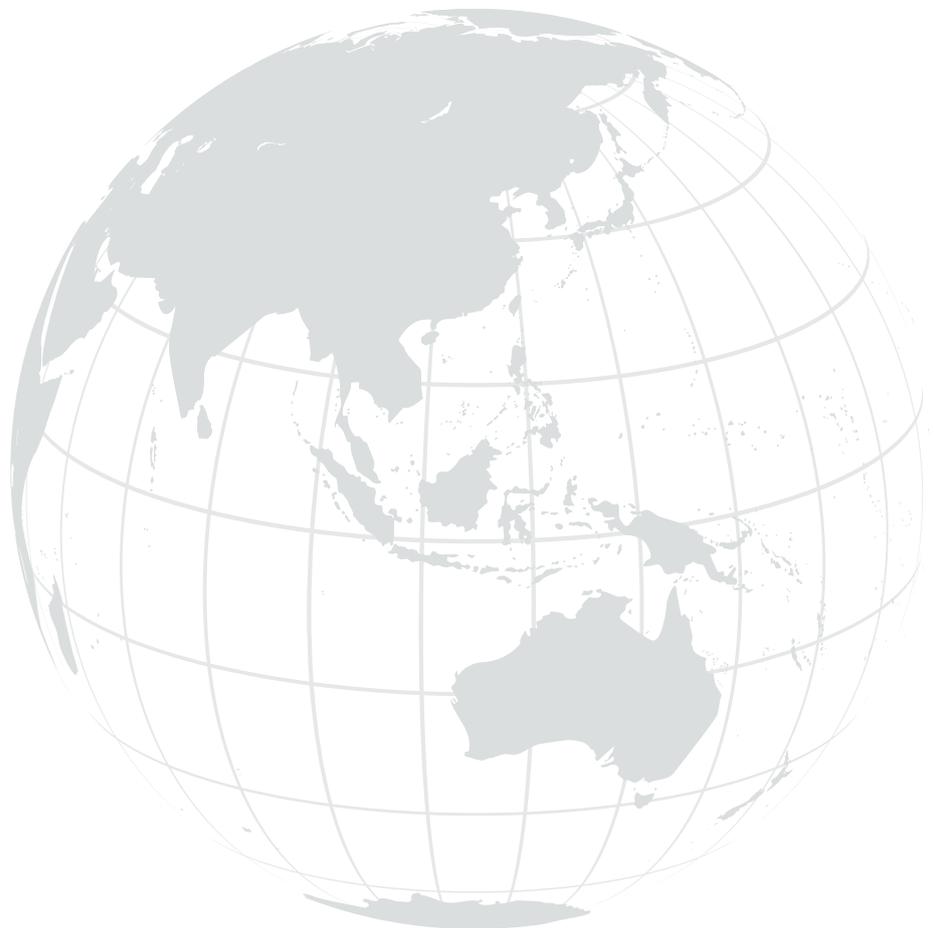
## Discussion

The ensuing discussion focused on the following themes:

- the applicability of rubanisation
- the applicability of UPA
- the role of multilateral dialogues in enhancing food security

On the question of the applicability of rubanisation, it was explained that rubanisation addresses the problems posed by the rural-urban dichotomy and does more good than harm. Countries are becoming increasingly serious about rubanisation because of the adverse consequences of the current economic growth model as manifested in rising income inequality, air pollution, water pollution, overpopulation, etc. Rubanisation offers an alternative mode, one which emphasises sustainable development, and which is able to provide solutions to problems that currently afflict urban areas.

There are also concerns over the applicability of UPA because land is expensive in urban areas. And since agriculture is not considered profitable, land in urban areas is likely to be allocated to the business sector. The implementation of UPA, it was observed, faces severe limitations. However, it was argued that the increasing prices of land in urban areas are simply a result of government policies. Existing policies lack provision for land rationing. As a result, cities have seen unregulated growth and competition over land which in turn has led to skyrocketing land prices. Strong government policies are thus critical. Governments must enforce strict land rationing, conserving land for agriculture. On the role of multilateral dialogues in enhancing food security, it was acknowledged that such dialogues can help synergise policies on urban food security by bringing together various stakeholders.



## Session II: Food Security Information Systems

Food security information systems help target vulnerable groups and identify policies and programmes which improve their resilience to future shocks. The availability of accurate and timely information concerning the supply of rice and other commodities plays a vital role in ensuring food security. Accurate and reliable production, consumption and trade data are indispensable in formulating effective and efficient policies and strategies for stable food supplies to the population. This session therefore focused on the following themes:

- an overview of food security information systems in ASEAN
- approaches that could be integrated into the food security information systems

### An Overview of the Food Security Information Systems in ASEAN

Due to the growing concern over food security in East and Southeast Asia, the Ministers of Agriculture and Forestry of the ASEAN member states plus China, Japan and Korea approved the setting up of the ASEAN Food Security Information System (AFSIS) project in October 2002. The first phase of the project was carried out between 2003 and 2007. The second phase started in 2008 and will terminate in 2012. The project is funded by Japan through the ASEAN Trust Funds and is led and coordinated by Thailand's Ministry of Agriculture and Cooperatives. The overall objective of the project is to strengthen food security in the region through the systematic collection, analysis and dissemination of food security related information. It is hoped that the AFSIS project will help promote regional food security and cooperation among states in the region and beyond. In order to achieve the aforementioned objectives, the implementation of the project has two major components:

- Human resource development: The project aims to raise the capacity of member states through a combination of activities such as training, workshops and national seminars. The second phase of the project introduced mutual technical cooperation to replace national seminars of the first phase. The objective of such cooperation is to share knowledge among ASEAN member states.
- Information network development: This component is concerned with the development of a regional food security information network including a database to enable the availability of food security related data and information. Such information is critical for policy planning. The project also planned to provide member states and project management units with the necessary computer hardware and software to develop information networks at both national and regional levels.

Each member country nominates a 'focal point' for the project. The focal points are responsible for managing and assisting in carrying out project activities including the provision and updating of food security related information to the AFSIS website. The ASEAN Food Security Information and Training (AFSIT) Center, the project's management unit is responsible for the maintenance of the website. The expected outputs from the project in both the first and second phases are as follows:

- The project will enable member states to provide accurate, reliable and timely information required for the construction of regional food security information.
- The project will provide complete information needed for the planning and implementation of food security policy in the region.
- The development of early warning and commodity outlook information will facilitate the management of food security policies and programmes. This will in turn enable the assessment of food security situations in the region and help identify areas where food insecurity is likely to occur.

While the AFSIS project has seen remarkable progress in terms of operationalisation, the quality of data and their reliability remain a concern. Data quality can be improved through periodic analysis and the monitoring of food situations such as supply and demand balances, trade and prices. Technology transfer is essential to help countries with limited technical capacity improve their data collection methodology. Also, establishing links and synergising efforts among governments, non-governmental organisations (NGOs), the private sector and farmers can help improve information dissemination.

## Approaches that Could Be Integrated into Food Security Information Systems

### Supply-demand modelling and planning

National level food security (NLFS) refers to the overall availability of food in a country. Persistent food surplus generally leads to low food prices, thus improving the food security of (poor) households. However, it hurts farmers as they would not be able to sell their produce at a high price;

this would affect their incomes. Persistent food deficit on the other hand results in high food prices worsening the food security of (poor) households. However, it may actually benefit farmers. Finally, fluctuations in food availability lead to price volatility and uncertainty. This affects both farmers as well as consumers.

Food availability is affected by a number of factors including: the international trade in food and world price volatility; the increasing cost of energy, whether for direct use on farms or as part of the cost of other inputs especially fertiliser; the privatisation of research (in seed technologies) and its impacts on developing countries, particularly poor farmers; water availability; soil/environmental degradation; and climate change. Given these factors, there is a pressing need for models to project and ascertain food supply and demand at the national level. Models will also enable the careful and thorough assessment of NLFS which is critical for policy interventions. NLFS can be assessed and measured using either separate supply and demand models or an integrated supply and demand model as illustrated in Box 1.

Box 1: Modelling national level food security (NLFS)

### Model 1: Separate supply and demand models

#### a. Supply

*Supply = Production + Net-stock run down*

Food supply can be modelled using either crop acreage and yield models or production models. The key determining factors in both models are: economic factors such as the price of crops, the price of competing crops, wages, infrastructure, market structure, credit, etc.; agro-ecological factors such as rainfall, soil types, temperature, etc.; farm inputs such as irrigation, seed varieties, fertilisers, pesticides, mechanisation, research and extension services, etc.; and government policies including rice support, input subsidies, economic factors, agricultural factors, farm inputs and government policies influencing supply.

In order to obtain good results, data must be crop specific and it should be classified at farm level and by cropping season. Additionally, data must be verifiable at the administrative level, i.e., at the district, state, province, national and other levels.

#### b. Demand

*Demand = Final consumption (Households + Government) + Intermediate demand (Seed, feed, agro-processing) + Wastage*

Household food demand can be modelled using single commodity models, models with limited sets of commodities or models that encompass the entire demand system (both food and non-food commodities including services). The determining factors include: economic factors such as price, income, etc.; socioeconomic factors such as income, location (rural or urban), social groups, etc.; demographic factors such as the age profile; and government policies including income transfer programmes, consumption subsidies, specific food/nutrition programmes, etc.

### Model 2: Integrated model

The integrated model combines both supply and demand models into a single model.

### Research and development

Food insecurity in Asia is full of contradictions and paradoxes. It is acute in some places and not seen in others. The region is home to the world's two biggest rice exporters, Thailand and Vietnam; but also the biggest importer, the Philippines (and, historically, Indonesia); and the two giants of global food production and consumption, China and India.

A number of inter-related factors contribute to food insecurity in Asia. Foremost among them is poverty. Again this is the paradox of Asia being increasingly recognised as the growth engine of the world. Asia as a whole contributes 15 per cent to global gross domestic product (GDP): East Asia and the Pacific alone accounts for 9 per cent of global GDP whereas South Asia accounts for 2 per cent. Yet nearly two-thirds of the world's 1.4 billion poor and about 65 per cent of the world's hungry population live in Asia. The poor spend on average about half of their income on food: rice alone accounts for nearly half of their food expenditures and one-fifth of total household expenditures.

Achieving and sustaining food security in Asia is a daunting task: to meet the projected demand for food in Asia-Pacific, cereal production alone will have to increase by nearly 50 per cent and meat production by 85 per cent by 2030. Research and development and technology are the key to achieving increased food production. An emphasis on research must first recognise the gaps that exist in current research. One way to fill this gap is by prioritising research agendas. An overview of research priorities for South Asia, Southeast Asia and Oceania is provided below.

#### ***I. Reaching the poor and hungry***

In order to win the fight against both poverty and hunger, research must be pursued in the following areas:

##### *Increased productivity*

- Food staples: rice, wheat, local staple cereals, pulses
- Diversified crops/livestock: horticulture, fisheries, livestock, vegetables and fruits

- Science and technology: germplasm conservation and improvement, genetic improvement, management of biotic and abiotic stresses, sustaining Pacific atoll livelihoods

##### *Improved value chain development*

- Infrastructure: post-harvest, agro-processing, information and communications technology (ICT), safety and quality, transport
- Markets and networks/partnerships: Public-private-partnerships, south-south cooperation, niche markets (domestic and foreign), trade facilitation

##### *Increased resilience*

- Climate change management: adaptation and mitigation, increased capacity in the area of modelling
- Economic shocks: rural and non-farm jobs, risk management, resilience to market volatility, etc.

#### ***II. Strengthening the information system***

It has been noted that research and development is central to the ongoing fight against poverty and hunger. Research and development can also strengthen the information aspect of food security, particularly efforts in the areas outlined below.

- Improved data collection and database development: periodic analysis of supply and demand balances, trade and prices; dynamic monitoring, evaluation and impact assessment/risk analysis; study of various technology interventions; exploration of alternative farming systems
- Enhanced technology awareness and dissemination: research on new paradigms of technology transfer, and assessments of alternative modes of improving information and database management to facilitate access and exchange among ASEAN member countries

- Market strengthening: undertaking market research to determine geographical advantage, commodity type, volume, risks, etc. to enhance incentives to increase production on the one hand, and for farmers' use in production planning on the other; identifying the most appropriate and effective approach to integrate farmers along the value chain; undertaking research on the effectiveness of the models used by agribusiness firms; exploring innovative business models for financing to provide effective guidance for their adoption

### How agribusiness obtains information

Agribusiness is synonymous with corporate farming and involves seed supply, agrichemicals, farm machinery, wholesale and distribution of products, processing, marketing and retail sales. The food and agribusiness system is the largest economic sector in the world economy, representing roughly 50 per cent each of global assets, total global labour force and global consumer expenditures. To facilitate decision-making, agribusiness firms pay attention to the type of information required to make both short- and long-term investment decisions. The information needed in the short term includes beginning-of-period stocks which is the price at which the stock opens, imports for the period, and sales for the period. Information on long-term investment decisions on the other hand may involve the following process:

- Information on market indicators (such as tight stock availability, high prices, etc.) is collected and thoroughly analysed. The reason(s) would then be established, for instance, high prices and tight stock availability may be caused by an increased demand for commodities, a weak dollar, high oil prices, price speculation, etc.
- Secondary data research is undertaken to identify more trends and to establish a theoretical framework that would guide investment decisions.
- Finally, the framework is subjected to real-time market testing to identify investment opportunities.

The aforementioned decision-making process may result in agribusiness firms investing in paddy milling in country A, exporting its rice stocks holding from country B or investing in farming in country C.

The required information for decision-making are obtained from multiple sources including public data or online databases; regional information systems; government reports and statistics; market research into trends of food production and consumption; secondary information sources such as import figures; real-time monitoring of stocks, prices, sales, events, etc.; and accumulated knowledge gained through research and experience. The use of data from such a wide range of sources and the monitoring of their changes enable better projections of the nature of future food security and potential risks.

Besides enabling both short-term and long-term investment decisions, information gathered through the process described above also enables the identification of both current and future trends. For example, some agribusiness firms conclude that the rate of rice consumption has outpaced production. Increasing production will require sustained efforts over 7 to 10 years. In the meantime rice availability will continue to remain tight. With low buffer stocks, markets will remain highly volatile due to short-term imbalances in demand and supply as well as due to government restrictions on exports.

Despite the current volatility of the global food system, agribusiness firms hold the view that barring war, natural disasters, riots, etc., (urban) food availability is not a problem. Urban food security therefore is not about availability but about affordability. The way to address food insecurity therefore is to make food affordable and to stabilise prices.

### Discussion

The discussion that followed focused on the following:

- the utility of modelling given the unpredictable nature of the global food systems
- the impact of data quality on modelling outcomes

It was acknowledged that models have limited utility given the unpredictable nature of the global food systems. However, it was argued that models are helpful in evaluating past and future trends and in particular in the evaluation of trends related to food supply and demand. While models could not always account for climatic uncertainties that could bring in new problems

or alter future trends and developments, they still help to conceptualise future food scenarios. In order to make models effective given the unpredictability of the global food systems, more research is needed and new models need to be developed and tested.

In terms of how data quality impacts modelling outcomes, there was a consensus among participants that data quality did affect outcomes especially those involving future projections. Wrong projections can complicate and compromise policy planning. Timely adjustments in data set could compensate for this weakness. The use of modelling must be seen in terms of its potential to identify, and help in improving, the strengths and weaknesses of a particular system.

## Focus Group Discussion I: Urban Food Security

The focus group discussion on urban food security attempted to identify the following:

- threats to urban food security
- gaps in knowledge on urban food security in particular and food security in general
- entry points for intervention
- the role of Singapore in ensuring regional food security

### Threats to Urban Food Security

Threats to urban food security exist on three levels: the macro-level, the meso-level and the micro-level. Threats at the macro or global level stem from seasonal and/or sudden unforeseen crises such as environmental disasters (prolonged droughts and floods, outbreaks of diseases, financial crises, changes in international policies that affect the demand and supply of food such as trade barriers, hostilities and changes in the cost of energy sources). The ramifications of these threats are amplified by the strong interdependence between urban and rural areas. In other words, urban food security cannot be divorced from rural food security and vice versa. Rural food security is affected by developments in urban areas. Large-scale reverse migration from urban to rural areas in times of economic downturn adds pressure on the food resources of rural areas. An outbreak of disease also poses a threat to both food utilisation and physical access to food as certain food products can be infected.

At the meso or national level, the lack of a holistic approach affects urban food security. This is evident in policies such as the leasing of agricultural lands to foreign countries or firms. This phenomenon, also called land grabbing, has the potential to threaten both the physical and economic access to food for local communities who have effectively lost the right to cultivate the lands. Thus farmers are being transformed from independent producers to contract labourers in foreign-owned farmlands.

At the micro or individual level, the lack of knowledge and skills on sustainable agricultural practices can pose threats to urban food security. Farmers, for instance, may lack the technology which could increase agricultural productivity. Although training is available in this field, it was observed that they are often based on commercial needs rather than social and ecological needs.

### Gaps in Knowledge on Urban Food Security in Particular and Food Security in General

At the regional level, there is a dearth of research on sustainable food production. Current agricultural practices prove to be unsustainable. There is a need to initiate research in this area. There is also a lack of threat analysis mechanisms in Southeast Asia. This was evidenced in the near total absence of a strong early warning system on natural disasters and diseases in Southeast Asia. There is a lack of concerted regional efforts in assessing the comparative advantages of countries in Southeast Asia. Such calibration of the competitive advantage in agricultural production and geographical location of countries in Southeast Asia can inform policies to boost net productivity levels.

At the national level, there is a lack of research on the link between national and household food security. Food security at the national level does not always translate into household food security. There is a need to analyse how food prices affect households at different levels of income and social status. The phenomenon of farmland acquisition has proliferated in Southeast Asia. Countries such as Saudi Arabia, Kuwait, Bahrain, Qatar, China and South Korea have acquired lands in the Philippines, Indonesia and Cambodia to cultivate food. However, most governments in Southeast Asia have no inkling of the real impact of these deals on farmers and rural communities. People are being displaced as a result of foreign purchases of land and there are fears of losing local food sovereignty.





**Front row (left to right):** Dr. Vasant Patil, Dr. Apichart Pongsrirhadulchai, Asst. Prof. Md Saidul Islam, Dr. Monique Elisabeth van Donzel, Prof. Jianming Cai, Prof. Paul Teng, Assoc. Prof. Mely Caballero-Anthony, Dr. Gil Saguingit Jr, Mr. Nyakua Simon Dladri, Mr. David A. Katz and Ms. Veronica Gan.

**Middle row (left to right):** Asst. Prof. Mark Chong, Ms. Stephanie Chew, Dr. Johannes D. Rossouw, Dr. Geoffrey Benjamin, Mr. Rajeev Raina, Dr. Margarita Escaler, Dr. Mercedes A. Sombilla, Dr. Rolando Dy, Ms. Sonny Tababa, Dr. Thi Ly Thu Pham, Ms. Waraporn Saelee and Ms. Betty Chin Ip.

**Back row (left to right):** Mr. Hein Mallee, Mr. Stephen Meister, Mr. Yang Razali Kassim, Mr. Pau Khan Khup Hangzo, Dr. Bill Durodié, Dr. Tan Siang Hee, Mr. Kwa Chong Guan and Dr. Ganesh Kumar Anand.

Urban dwellers are found to lack a general awareness of the important contribution of urban agriculture to national food security. This is because agriculture has traditionally been considered a rural phenomenon. As a result, the response capacities of urban dwellers in the face of crises such as food price inflation or economic recession are limited to diversifying food consumption and limiting dietary intakes. There should be greater awareness of the importance of urban food security and urban dwellers must increase their capacity to produce at least some of the foods that they consume. Urban dwellers are also not sensitised to aspects of sustainable living. Higher levels of economic development have corresponded to higher levels of consumption, which would imply a greater stress on limited natural resources.

Rural communities, on the other hand, lack market information and access. This is detrimental especially to small farmers as it affects their investment planning. As a result, they sell what they grow and not grow what they can sell. It is therefore important to help small farmers access market information so that they can maximise their profits. At the same time, there should also be a protection mechanism for small farmers in crisis situations.

### **Entry Points for Intervention**

#### **Early warning systems**

An effective early warning system is critical to tracking changes in food security conditions. In particular, it provides advance notice of a deterioration of a situation, and enables contingency plans to be adjusted accordingly. It could also be used to support programme monitoring by providing food security information on areas with and without assistance. Early warning is especially critical

in Southeast Asia as the region is highly vulnerable to natural disasters. Countries in the region must collaborate in developing capacity on early warning at both the regional as well as the national levels.

#### **Peace, order and stability**

Armed conflicts and violence disrupt food production through the physical destruction and plundering of crops and livestock, harvests and food reserves; they prevent and discourage farming; they interrupt the lines of transportation through which food exchanges, and even humanitarian relief, take place; they destroy farm capital, conscript young and able-bodied males, taking them away from farm work and suppress income earning occupations. The impact of conflicts on food security often lasts long after the violence has subsided, because assets have been destroyed, people killed or maimed, populations displaced, the environment damaged, and health, education and social services shattered. Peace, order and stability are thus essential elements of food security and must be one of the major priorities.

#### **Land-use planning**

Land-use planning is the systematic assessment of land and water potential, alternatives for land use, and economic and social conditions, in order to select and adopt those land uses that will best meet the needs of the people while safeguarding resources for the future. The demands for arable land, grazing, forestry, wildlife, tourism and urban development are greater than the land resources available. Governments must therefore take effective steps to preserve and protect prime agricultural lands to meet the future demands of food.

### Technology transfers

Currently, there is a lack of mechanisms to analyse threats that affect the food system in Southeast Asia. This is primarily due to limited capacity in terms of knowledge and technology. Technology transfer can play an important role in helping countries in the region with limited technological capacity to establish a mechanism to analyse threats and risks to the regional food system. To this end, a comparative analysis of the core capabilities of countries in Southeast Asia must be undertaken. For instance, Thailand, the Philippines and Vietnam have significant expertise in agronomics which they can share with other countries in the region. Singapore can also contribute in areas such as supply chain management, investment, etc.

### Promoting public awareness

Nutritional guidelines for each food category are essential in helping to raise awareness on nutrients and diet. A regional body mass index (BMI) which measures the effects of body weight on health can help raise awareness in this area. There is also a need to encourage lifestyle changes by advocating, for example, 'green consumerism' as a means of sustainable and healthy living. Adhering to such lifestyles can also help reduce per capita resource consumption.

### Food-based safety net programmes

Safety nets are non-contributory transfer programmes targeted at the poor and vulnerable because while everyone is vulnerable to food insecurities, the poor are a great deal more vulnerable than others. The main objective of food-based safety net programmes is therefore to provide adequate food and help poor consumers achieve and maintain better nutritional status. In the absence of such intervention they would likely curtail their food consumption, resulting in malnutrition, disease and possibly death.

Some countries in Southeast Asia still have a very high incidence of extreme poverty: more than 40 per cent of the population in Cambodia, Lao PDR and Timor-Leste and more than 20 per cent of the population of Indonesia, the Philippines and Vietnam live on less than USD 1.25 a day. Countries in Southeast Asia already have a number of food-based safety net programmes including supplementary feeding programmes, food-for-work programmes, food stamps, vouchers, coupons and food price subsidies. However, most of these programmes are poorly targeted resulting in a high rate of leakage to non-poor households. Improving targeting mechanisms will increase the efficiency of existing safety net programmes.

### The Role of Singapore in Ensuring Regional Food Security

Singapore can play a significant role in sustaining regional (urban) food security. The areas where it can contribute are:

#### Knowledge hub

Singapore can serve as a knowledge platform for Southeast Asia. It can play a significant role in furthering research and development in biotechnology (life sciences and genetic engineering) to enable farmers to maximise their agricultural output. It can also use its expertise in the sciences to improve the production of food crops that are generally ignored by large firms such as leafy vegetables and fruits. Singapore is also home to a number of research-oriented local and foreign agribusiness firms. By harnessing the knowledge and expertise of these firms, it can take the lead in developing high-yielding seed varieties, fertilisers, pesticides, etc. Singapore can also share its expertise in marine aquaculture with countries such as the Philippines and Indonesia. On the whole, Singapore can facilitate and inspire technology transfers, best practices and business models.

### **Standards setting hub**

Singapore has very strong regulatory control over the quality and safety of food and has stringent food safety standards. With food safety increasingly becoming a major policy concern, the relevant Singapore government agency (or agencies) can act as a referral point for food safety standards in Southeast Asia.

### **Financial hub**

Singapore is a key player in the global financial sector, with financial services constituting a significant component of its economy. More than 600 financial institutions operate in the country providing a wide range of financial

products and services in the areas of consumer banking, corporate and investment banking, fund management, insurance and treasury activities. Singapore can thus capitalise on this position to raise funds for investment in agriculture for Southeast Asia as a whole.

### **Logistics hub**

Singapore's world-class infrastructure and connectivity makes it one of the world's leading hub ports. It can leverage on its efficient logistics and provide supply chain management services to countries in the region. Specifically, Singapore can serve as a regional food processing and distribution hub.



## Focus Group Discussion II: Food Security Information Systems

This focus group discussion aimed to identify gaps in the AFSIS. An evaluation of existing data in the AFSIS website points to an urgent need to improve the capacity of countries to systematically collect and report reliable data; data submitted by some countries date as far back as 1985. The ability to report reliable data and information is in turn dependent on the technical and statistical capacity of each country in Southeast Asia. There is consensus among participants that while data can never be completely accurate, its reliability can nevertheless be improved. Areas of improvements suggested by discussants are grouped under the following themes:

- usage of data
- data collection
- data processing
- data dissemination

### Usage of Data

#### User-friendly website

The AFSIS website must be user-friendly and interactive. Data should be made available on the website immediately after principal analysis and reporting have been carried out by relevant government agencies.

#### Application of information

The information available in the system can have a number of applications which can influence policies related to food security. It can help stakeholders understand past and emerging trends and assist in formulating policies in areas such as import, export, price, distribution, etc.

#### Forecasting and early warning

Data on food security collected from various countries can assist in forecasting future trends and offer early warning on issues such as price rise, food shortages, etc.

#### End-user training

It is not enough to have a well-established system loaded with important information and data; users must also be able to decipher the meaning of that available information. Users must thus be trained or informed on how they can make use of the data collected, what data collection methodologies are being used, and how they can make use of the data and information.

### Data Collection

#### Conceptual framework for agricultural data and statistics

Currently, there is no conceptual framework for agricultural data and statistics in Southeast Asia. While agriculture is fundamentally an economic activity, in that its purpose is the production of food and other commodities, concern about its relationships to environmental and social issues has been increasing. These relationships must be considered within a broader context, in which agriculture, the environment and social factors are no longer treated as discrete disciplines. A conceptual framework that brings together the economic, environmental and social dimensions of agriculture and the cause-and-effect relationships that connect them is thus essential. Agricultural statistics are thus needed at the following stages: inputs, outputs, outcomes and ultimate impacts.

### **Capacity building**

In the context of the AFSIS, capacity building involves the establishment of a minimum set of core data that countries will collect to monitor national, regional and global trends. The AFSIS's effectiveness depends on the ability of Southeast Asian countries to provide such data. However, most countries in the region lack that capacity. Capacity building involves the creation of an enabling environment comprising appropriate policy and frameworks; institutional development, including community participation; human resources development; and the strengthening of managerial systems. It is a long-term, continuing process in which all stakeholders have to participate.

### **Technical assistance**

Technical assistance is the provision of information, advice, training and consultancy in a specified area. The reliability of data and statistics in the AFSIS website depends upon the technical and statistical capacity of each country in Southeast Asia. However, some countries in Southeast Asia are a great deal more disadvantaged than others because they lack the required specialised skills. Technical assistance in the form of training and financial aid must be provided to such countries so that they can improve their data collection and processing capacity.

### **Engaging new sources of data**

Information on food security is not just limited to production, prices, trade, etc. New sources of information and data that could assist in policymaking should be explored. Examples include the sourcing of data from the private sector and NGOs.

### **Improving data input**

An evaluation of existing data points to an urgent need to improve the capacity of countries to systematically collect and report reliable data. A standardised definition on variables is important so that data or information submitted by countries in Southeast Asia is consistent with one another. Key terms such as harvest year, wholesale price, retail price, etc. should be clearly defined and their usage consistent across countries. Improving the coordination between national statistical organisations and the other national agencies that produce agricultural statistics could also help in gathering reliable data. Another way to improve data is to carry out household/industry surveys every 3–5 years. This will enable the collection of the latest estimates and information. In order to enhance data collection, advanced tools such as the geographic information system (GIS) or the global positioning system (GPS) should be utilised.

### **Expanded channels**

Emphasis should be placed on networking with other local institutions that are also involved in data collection along similar parameters. Channels should be established for primary producers to provide production data in real time.

### **Timelines**

For the AFSIS to be relevant, data should be fed into the system on a regular basis. They should also be updated regularly.

### **Financial resources**

The success and sustainability of the AFSIS would depend on the availability of funds. Funding must therefore be a top priority and should be pursued actively. Besides contributions from ASEAN member states, the AFSIS must also engage as many partners as possible to fund the system.

## Data Processing

### Tools for better processing

Apart from human resource requirements, tools for better data processing include the use of good software and hardware to improve the accuracy and speed of processing. One example of an effective software application is the software as a service (SaaS), also called the 'software on demand' application. SaaS is software that is deployed over the internet and/or is deployed to run behind a firewall on a local area network or personal computer. With SaaS, a provider licenses an application to customers either as a service on demand, through a subscription, in a pay-as-you-go model, or (increasingly) at no charge. The advantage of SaaS includes pay per use, instant scalability, security and reliability. Besides existing software, research institutions, universities and the private sector should work together to develop new tools for the AFSIS.

### Ensuring the quality of data inputs

A centralised data collection point is highly desirable. There should be a mechanism to clarify data collected from sources before it is fed into the centralised system.

### Capacity building

Data should be processed in such a way that it is easily accessible and understandable. To this end, training on data processing should be imparted to staff using simple and yet effective software programmes.

### Better analysis

Better data analyses can be achieved through the grouping of agricultural products by regions and provinces, yield and wastages, etc. Efforts should also be made in the areas of statistical analysis, the construction of food security indicators and the computerisation of data to aid analysis.

## Data Dissemination

### Identifying and locating users

It is important to compile a list of stakeholders or users of data and information on food security and to disseminate information to them. The objective of creating a distribution list is to reach out to as many stakeholders as possible and thus create awareness on the utility of data compiled by the AFSIS.

### Methods of dissemination

Various methods of dissemination should be explored and implemented including organising seminars for key stakeholders; monthly/quarterly bulletins in print and/or in electronic form; email alerts; annual reports; a web portal which can be used upon registration; uploading key findings and summaries on the website/portal; the provision of CDs via a minimal charge, if necessary; providing links to relevant websites; making information accessible through mobile devices for primary producers, etc. Finally, awareness and feedback mechanisms should also be created so as to facilitate two-way communication.

### Closing Remarks

*Associate Professor Mely Caballero-Anthony  
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The Food Security Expert Group Meeting, according to Associate Professor Mely Caballero-Anthony, provided participants with the opportunity to engage in a dialogue on an issue that is central to human security. The aim of this Meeting was to derive key policy recommendations which could be directed to the Association of Southeast Asian Nations (ASEAN) through track two organisations such as the Council for Security Cooperation in the Asia Pacific (CSCAP).

One of the aims of RSIS, as a think tank and as an academic institution, is to facilitate dialogue among a wide variety of actors. Professor Caballero-Anthony cited a conference on pandemic preparedness organised by the RSIS Centre for NTS Studies in 2009 as an example. The conference brought together participants from the health community, government organisations, policy think tanks and research institutions.

Reflecting on the Meeting, Professor Caballero-Anthony acknowledged and thanked the participants who come from diverse fields including academia, policy think tanks, research institutes, agribusiness firms, government agencies, humanitarian organisations, etc. Such a diverse group, according to Professor Caballero-Anthony, helps in the development of a holistic understanding of the concept of food security.

Professor Caballero-Anthony also extended an invitation to all participants to attend a larger conference on food security to be held in the first quarter of 2011. The projects and themes discussed during the Meeting would be fed into the crafting of the agenda for the next conference. Professor Caballero-Anthony then thanked all participants, rapporteurs and organisers for the successful conclusion of the two-day Meeting.

*Professor Paul Teng  
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Professor Paul Teng thanked the organisers, participants and speakers for taking the time to attend the Food Security Expert Group Meeting. Food security, according to Professor Teng, is a multifaceted, multidimensional, and multi-sectoral issue which requires an equally multidimensional and multi-sectoral approach. He called upon all participants to encourage and support one another and to continue exchanging ideas and insights through similar conferences.

Professor Teng noted that greater awareness can be raised through the participation of more people which would then cascade down to decision-makers and potential funders. It was hoped that the momentum generated by the Food Security Expert Group Meeting would result in more discussions and a concrete plan of action.

Professor Teng proposed one possible action item, that is, the setting up of a distribution list for all participants. The other action item is to create a formal food security network for Asia. He mentioned the example of the agri-food network in Singapore whose members meet regularly to discuss pertinent issues and strengthen connections with one another. Such networks can facilitate the promotion of food security as an agenda for ASEAN. Professor Teng notified participants that information and publications related to the Meeting would be circulated to all and the outcome document will be used to prepare proposals and concept notes. He reiterated the need to support one another and thanked all participants for the fruitful discussions.

## Programme

### 4 August (Wednesday)

The Gallery, Level 2, Traders Hotel

08:30 – 08:55 **Registration**

09:00 – 09:10 **Welcome Remarks**

Ambassador Barry Desker  
Dean, S. Rajaratnam School of  
International Studies (RSIS),  
Nanyang Technological University,  
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09:10 – 10:10 **Session I: Urban Food Security**

Chair: Associate Professor  
Mely Caballero-Anthony  
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- **Urban Food Security:  
Framing the Concept, Its  
Externalities and Internalities and  
Implications for R&D and an  
Action Agenda**

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- **Urban and Peri-Urban Agriculture:  
Learnings from Developed and  
Developing Countries**

Professor Jianming Cai  
China Regional Coordinator of  
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10:10 – 10:30 **Photo Opportunity and Coffee Break**

10:30 – 12:10 **Session I – continued:  
Urban Food Security**

Chair: Associate Professor  
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- **The Rubanisation Concept to  
Bridge Rural-Urban Expectations  
and Needs**

Adjunct Professor Tay Kheng Soon  
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- **Global Food Supply Chains and the  
Role of Agribusiness in Food Security**

Dr Rolando Dy  
Executive Director,  
Center for Food and AgriBusiness,  
University of Asia and the Pacific,  
Philippines

- **Discussion**

12:00 – 13:15 **Lunch**

13:15 – 15:45	<p><b>Session II: Food Security Information Systems</b>            Chair: Professor Paul Teng            Dean            Graduate Programmes and Research,            National Institute of Education (NIE)            and Senior Fellow and Adviser to the            Food Security Programme,            Centre for Non-Traditional Security            (NTS) Studies,            S. Rajaratnam School of International            Studies (RSIS)            Nanyang Technological University,            Singapore</p> <p>• <b>Current Status of the ASEAN Food Security Information System (AFSIS) and Food Security Framework</b>            Dr Apichart Pongsrihadulchai            Advisor to the Minister of Agriculture            and Cooperatives,            Ministry of Agriculture and            Cooperatives,            Thailand</p> <p>• <b>Supply-demand Modelling and Planning for Food Security</b>            Dr Ganesh Kumar Anand            Research Fellow,            Environment and Production            Technology Division,            International Food Policy Research            Institute (IFPRI),            India</p> <p>• <b>R&amp;D in ASEAN to Improve Information on Food Supply and Productivity</b>            Dr Mercedita A.Sombilla            Manager, Research and            Development Department,            The Southeast Asian Regional Center            for Graduate Study and Research in            Agriculture (SEARCA),            Philippines</p>		<p>• <b>How Agribusiness Obtains Information for Decision-Making</b>            Mr Rajeev Raina            Senior Vice President and            Head, Rice Division,            Olam International Limited,            Singapore</p> <p>• <b>Discussion</b></p>
		15:45 – 16:00	<b>Coffee Break</b>
		16:00 – 17:30	<p><b>Session III:            Focus Group Discussions FGD I:            Urban Food Security</b></p> <p><b>Facilitators:</b>            Dr Margarita Escaler            Research Fellow, Graduate            Programmes &amp; Research Office,            National Institute of Education (NIE),            Nanyang Technological University,            Singapore            and            Associate Professor            Mely Caballero-Anthony            Head, Centre for Non-Traditional            Security (NTS) Studies,            S. Rajaratnam School of International            Studies (RSIS),            Nanyang Technological University,            Singapore</p> <p>This focus group discussion looks at the way Urban Food Security is affirmed and differentiated from or linked to global food security. Specifically, it will focus on how Urban Food Security is characterised as a subsystem of the global food system. It will also look at the current state of knowledge on Urban Food Security including technologies and modalities. In doing so, it will attempt to identify the knowledge gaps, research priorities and the role Singapore can play in addressing the issue.</p>

## FGD II: Food Security Information Systems

### Facilitators:

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This focus group discussion looks at ways in which an early warning facility on Food Insecurity was conceptualised. In so doing, it will analyse the ASEAN Food Security Information System (AFSIS), identify gaps and the means to strengthen its databases and capacity, and the roles of ASEAN national and regional partners. The discussion will also look at ways in which an integrated management information system (MIS) can contribute to Food Security in the region. The discussion will focus on the design parameters of MIS with planning and forecasting capabilities. It will also attempt to identify information gaps, research priorities, partners, and Singapore's role in the MIS.

5 August (Thursday)

08:45 – 09:00 **Registration**

09:00 – 11:00 **Session IV: Focus Group Discussions**  
Continued FGDs and preparation for presentations and discussions

## FGD I: Urban Food Security

### Facilitators:

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**FGD II: Food Security  
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11:00 – 11:15 **Coffee Break**

11:15 – 12:45 **Session V: Focus Group Presentation  
and Discussion**

Chair: Dr Gil Saguiguit, Jr  
Director, The Southeast Asian Regional  
Center for Graduate Study and  
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12:45 – 13:00 **Closing Remarks**

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**End of Expert Group Meeting**

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## About the RSIS Centre for Non-Traditional Security (NTS) Studies

The **RSIS Centre for Non-Traditional Security (NTS) Studies** conducts research and produces policy-relevant analyses aimed at furthering awareness and building capacity to address NTS issues and challenges in the Asia-Pacific region and beyond.

To fulfil this mission, the Centre aims to:

- Advance the understanding of NTS issues and challenges in the Asia-Pacific by highlighting gaps in knowledge and policy, and identifying best practices among state and non-state actors in responding to these challenges
- Provide a platform for scholars and policymakers within and outside Asia to discuss and analyse NTS issues in the region
- Network with institutions and organisations worldwide to exchange information, insights and experiences in the area of NTS
- Engage policymakers on the importance of NTS in guiding political responses to NTS emergencies and develop strategies to mitigate the risks to state and human security
- Contribute to building the institutional capacity of governments, and regional and international organisations to respond to NTS challenges

### Our Research

The key programmes at the **RSIS Centre for NTS Studies** include:

- 1) Internal and Cross-Border Conflict Programme
  - Dynamics of Internal Conflicts
  - Multi-level and Multilateral Approaches to Internal Conflict
  - Responsibility to Protect (RtoP) in Asia
  - Peacebuilding
- 2) Climate Change, Environmental Security and Natural Disasters Programme
  - Mitigation and Adaptation Policy Studies
  - The Politics and Diplomacy of Climate Change
- 3) Energy and Human Security Programme
  - Security and Safety of Energy Infrastructure
  - Stability of Energy Markets
  - Energy Sustainability
  - Nuclear Energy and Security
- 4) Food Security Programme
  - Regional Cooperation
  - Food Security Indicators
  - Food Production and Human Security
- 5) Health and Human Security Programme
  - Health and Human Security
  - Global Health Governance
  - Pandemic Preparedness and Global Response Networks

*The first three programmes received a boost from the John D. and Catherine T. MacArthur Foundation when the RSIS Centre for NTS Studies was selected as one of three core institutions leading the MacArthur Asia Security Initiative\* in 2009.*

### Our Output

#### ***Policy Relevant Publications***

The **RSIS Centre for NTS Studies** produces a range of output such as research reports, books, monographs, policy briefs and conference proceedings.

#### ***Training***

Based in RSIS, which has an excellent record of post-graduate teaching, an international faculty, and an extensive network of policy institutes worldwide, the Centre is well-placed to develop robust research capabilities, conduct training courses and facilitate advanced education on NTS. These are aimed at, but not limited to, academics, analysts, policymakers and non-governmental organisations (NGOs).

#### ***Networking and Outreach***

The Centre serves as a networking hub for researchers, policy analysts, policymakers, NGOs and media from across Asia and farther afield interested in NTS issues and challenges.

The **RSIS Centre for NTS Studies** is also the Secretariat of the Consortium of Non-Traditional Security Studies in Asia (NTS-Asia), which brings together 20 research institutes and think tanks from across Asia, and strives to develop the process of networking, consolidate existing research on NTS-related issues, and mainstream NTS studies in Asia.

More information on our Centre is available at [www.rsis.edu.sg/nts](http://www.rsis.edu.sg/nts)



*\* The Asia Security Initiative was launched by the John D. and Catherine T. MacArthur Foundation in January 2009, through which approximately US\$68 million in grants will be made to policy research institutions over seven years to help raise the effectiveness of international cooperation in preventing conflict and promoting peace and security in Asia.*

## About the S. Rajaratnam School of International Studies, Nanyang Technological University

The **S. Rajaratnam School of International Studies (RSIS)** was inaugurated on 1 January 2007 as an autonomous School within the Nanyang Technological University (NTU), upgraded from its previous incarnation as the **Institute of Defence and Strategic Studies (IDSS)**, which was established in 1996.

The School exists to develop a community of scholars and policy analysts at the forefront of Asia-Pacific security studies and international affairs. Its three core functions are research, graduate teaching and networking activities in the Asia-Pacific region. It produces cutting-edge

security related research in Asia-Pacific Security, Conflict and Non-Traditional Security, International Political Economy, and Country and Area Studies.

The School's activities are aimed at assisting policymakers to develop comprehensive approaches to strategic thinking on issues related to security and stability in the Asia-Pacific and their implications for Singapore.

For more information about RSIS, please visit [www.rsis.edu.sg](http://www.rsis.edu.sg)

## NOTES

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CENTRE FOR  
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