

# POLICY BRIEF

By Paul Teng and Sally Trethewie

## Tackling urban and rural food wastage in Southeast Asia: Issues and interventions

Food wastage is prevalent in Southeast Asia and has significant implications for the region's food, environmental and economic security. It is likely that the region wastes approximately 33 per cent of food, but accurate estimates are not available due to a dearth of quantitative information. Wastage occurs at all stages of food supply chains, from the point of production to post-harvest, retail and consumption. Effective interventions to prevent and minimise food wastage exist but are not widely implemented in Southeast Asia. In the context of these issues, the RSIS Centre for Non-Traditional Security (NTS) Studies hosted an Expert Working Group Meeting in August 2012 to discuss food wastage in Southeast Asia. This policy brief draws on the findings of the meeting and provides several policy recommendations for Southeast Asian governments to address urban and rural food wastage.

## Introduction

For the sake of food, environmental and economic security, the world – including the region of Southeast Asia – cannot afford to continue to waste food at an estimated rate of 33 per cent. From food production to consumption, the causes of wasted food along Southeast Asian supply chains are relatively similar to the rest of the world, yet known interventions to prevent and minimise food wastage are not widely implemented. Accurate, up-to-date data on the extent of food wastage in the region is also not available; and this is both a cause and an effect of the relative lack of attention given to the issue by policymakers and the private sector.

It is within the context of these issues that the RSIS Centre for Non-Traditional Security (NTS) Studies convened the Expert Working Group Meeting on Food Wastage in Southeast Asia, with the aim of building knowledge and networks to address food wastage. This meeting, held on 23–24 August 2012 in Singapore, was supported by Singapore's National Security Coordination Secretariat (NSCS). It brought together 60 international and regional experts on food wastage, including researchers, government representatives, agronomists, post-harvest supply chain practitioners, retailers and civil society. Key areas of discussion included the extent of food wastage in Southeast Asia, food supply chain interventions, and research methodologies and information systems to address food wastage. This policy brief draws on the findings of the meeting.

The policy brief first briefly examines what is known (and not known) about food wastage. It then looks at the food, environmental and economic security implications of food wastage, relating these to the context of Southeast Asia. The policy brief concludes by outlining five possible policy pathways for addressing the issue. It also suggests that, in addressing food wastage in Southeast Asia, stakeholders may find it more useful to conceptualise food wastage along 'urban' and 'rural' dimensions.

## Food wastage in the literature

Considerable information is known about the typical causes of food wastage at different primary stages of food supply chains, with research suggesting that the same factors are at work the world over. The literature on food wastage typically differentiates between developing and industrialised countries. In developing countries, the majority of food wastage occurs at the production and post-harvest stages with very little food waste at the household level. In industrialised countries, post-harvest wastage is typically lessened through modernised supply chains, and the majority of the food waste occurs at the retail and consumer stages.

In Southeast Asia, research suggests that a significant amount of food wastage occurs within the production and post-harvest stages, as food production in the region is still dominated by smallholder farmers operating as part of traditional supply chains. There is also growing evidence that in the cities of industrialising Asian countries such as China and India, food wastage is increasingly occurring at the consumption stage. Further evidence is needed to see how this phenomenon is playing out in large Southeast Asian cities such as Bangkok, Jakarta and Manila.

## Securitising food wastage

Wastage of food is one of the most significant yet under-recognised issues in the effort to combat food insecurity. One billion people are currently inadequately nourished for a number of reasons, including food not being available and accessible. Furthermore, to feed the expanding global population and to meet the demand for greater variety of food as incomes rise, food production would have to increase by 70 per cent from current levels by 2050. With food availability a rising global and regional concern, food wastage becomes a significant issue.

Recommended citation: Teng, Paul and Sally Trethewie, 2012, *Tackling urban and rural food wastage in Southeast Asia: Issues and interventions*, Policy Brief No. 17, Singapore: RSIS Centre for Non-Traditional Security (NTS) Studies.

Wasted food also distorts supply and demand, which contributes to higher domestic and international food prices. This has broader implications than the price of the actual commodities themselves. For example, wasted meat not only impacts the price of meat but also the price of inputs into animal feed such as maize, soybean and wheat.

In the context of global hunger and malnutrition driven by unequal food availability and access, and volatile food prices, the need to take action to prevent food wastage at various points in supply chains is morally necessitated.

Beyond ethical considerations, food wastage is a significant drain on economic, environmental and human resources. The economic impacts of wasted food are multifaceted and far-reaching, affecting a range of actors, including governments, food producers, agribusinesses and households. Food wastage not only results in the loss of scarce environmental resources such as water, energy and soil, but also contributes significantly to greenhouse gas emissions. In industrialised countries, wasted food accounts for up to an estimated 10 per cent of such emissions. Furthermore, the wastage of food has significant implications for human resources, in that valuable human labour in food supply chains could be better utilised to meet the world's current and future food needs.

## **Southeast Asia's food vulnerabilities**

Southeast Asia is a region of contrasts as far as food security is concerned. It is at the heart of the world's rice sector and enjoys economic growth, yet undernourishment is prevalent in the region and large numbers of people are vulnerable to transitory food insecurity as food prices fluctuate. Environmental stresses and urbanisation, two important factors shaping the dynamics of the region's food security, have direct linkages to food wastage.

Southeast Asia's food production systems are critically threatened by environmental factors such as water scarcity, land degradation and pollution. Added to that, the region is extremely vulnerable to the effects of climate change. These factors, coupled with competition for land for non-food production uses, put food availability at risk, and increase the urgency of addressing food wastage.

Urbanisation continues to be a key trend, with a high proportion of the region's population growth projected to occur in cities. Southeast Asia's urban population is expected to outnumber its rural population by 2028. As incomes increase, these city dwellers will not only demand more food, but also more variety in their food, including more meat, wheat, fruit, vegetables, processed foods and dairy products, which would

## **Box 1: Major food wastage campaigns**

Many of the efforts that have been undertaken to combat food wastage are localised and civil society-led. Few initiatives exist at the national and regional level, thus it is worth mentioning here two pioneering programmes.

### **Waste and Resources Action Programme (WRAP)**

This domestic programme supported by the UK government aims to reduce food wastage. Under the programme, significant research has been undertaken to determine the extent and patterns of household wastage. Two key initiatives involve food recycling and waste prevention, and WRAP has established a number of voluntary agreements with major private sector stakeholders in the construction and retail industries.

### **Save Food: Global Initiative on Food Loss and Waste Reduction**

In terms of action at the international level, the Save Food campaign supported by the Food and Agriculture Organization of the United Nations (FAO) has achieved progress in spite of the lack of global food wastage data. This programme, which is based in Europe, has strong links to the private sector, and in particular the packaging industry.

Research for this campaign cites several food supply chain interventions to reduce food loss and waste. These include improving production planning in alignment with markets; promoting resource-efficient production and processing practices; improving preservation and packing technologies; and improving transportation and logistics management.

Save Food lists a range of policy actions to support supply chain interventions, including creating an enabling policy and institutional environment; engaging in awareness raising and advocacy; building partnerships and alliances between public and private sector stakeholders; supporting product and process innovation; developing the capacity of small- and medium-scale food chain operators; and improving the capacity of regional institutions, national government officials and development agencies. Very few of these actions have been implemented in Southeast Asia.

increase the pressure on food systems. Exacerbating this would be, as mentioned earlier, the rising food wastage at retail and consumption points that is already being observed in the region's economically prospering cities.

## **Recommendations for Southeast Asian policymakers**

Five policy recommendations follow which could potentially lay the foundations for the development of a comprehensive framework for addressing food wastage in Southeast Asia. These recommendations are broad and reflect the fact that although food wastage is a culturally and systemically deep phenomenon in this region, addressing the issues at the level of policymaking is at its early stages.

- ***Enhance government partnerships with agricultural development stakeholders to assist smallholder farmers and encourage sharing of best practices.***

Although modernised supply chains are becoming more prevalent with the rise of corporate grocers in the region, the main producers of Southeast Asia's food supply are smallholder farmers working within traditional supply chains. Research suggests that factors such as pest infestation, diseases, poor on-farm storage facilities, and limited use of agricultural technology contribute to these producers' losses. The warmth and humidity in the region also account for much of the loss of perishable crops. Building the capacity of smallholder farmers to reduce food wastage not only improves availability but benefits farmers' livelihoods through higher incomes and non-wasted labour.

Interventions for preventing wastage on smallholder farms include improving the efficiency of production and on-farm processing, ensuring that farmers have information on market requirements and are able to plan accordingly, and introducing appropriate modern technologies and farming techniques. Policymakers should create an enabling environment for these interventions, and build networks of local, national and regional actors that include officials and development agencies to assist with implementation. At the regional policymaking level, sharing best practices and establishing capacity-building programmes would lead to significant benefits.

- ***Incentivise the development and use of improved food storage, transport and packaging in traditional supply chains.***

Traditional supply chains experience significantly higher losses in post-harvest stages than modernised supply chains. There is thus considerable scope within traditional supply chains to implement better food storage, transport and packaging technologies. Policymakers should actively encourage the use of existing solutions, and support research and development projects to make such options affordable and available to traditional supply chain actors.

Existing information suggests that addressing the problem of poor and inadequate local market facilities is fundamental to improving the problem of food losses in Southeast Asia. An important intervention point to reduce loss of fresh produce in particular is the processing and packaging stage. For fish and seafood, the data indicates that the process of distribution is a key point of wastage in the supply chain. While these intervention points are relatively specific, it should be noted that the linkages and points of connection between the various stages in traditional supply chains are vital as well, and holistic strategies should be formulated accordingly. For example, innovative packaging solutions could address wastage at several traditional supply chain stages including transport, storage and retail.

- ***Modify policies to reduce and prevent retail and consumer food wastage in urban environments.***

Given the limited information currently available on the dynamics of urban food wastage in Southeast Asia, there is much that could be achieved through regional cooperation on best practices and knowledge sharing. Civil society-led research in Singapore suggests a number of points of intervention to address food wastage by urban food retailers and consumers.

In a modernised retail environment, profit-driven practices such as filtering produce so that only the freshest-looking food is put on display, keeping shelves fully-stocked and packaging in bulk contribute to wastage of food. Management-related factors such as ineffective storage, over-preparation, non-supervision of staff and inadequate employee training also play a part. Policymakers need to develop measures aimed at food retailers, such as higher fees for the disposal of food, and tax incentives to reduce food wastage.

Targeted policies to improve refrigeration and storage facilities at traditional urban retail outlets such as wet markets should also be considered. Anecdotal evidence from markets in Singapore suggests that 30 per cent of food is discarded because of aesthetic factors. Thus, policies that incentivise market stallholders to minimise such waste could be of benefit. To be effective, such policies would need to be complemented by campaigns to raise public awareness of food wastage in retail environments, and to educate consumers to accept food that may not be cosmetically perfect.

Based on evidence from cities in other industrialising regions, consumer wastage is likely to become more prevalent in Southeast Asia as incomes rise. This would be particularly in evidence at large banquets, festivals and celebrations. To address such consumer wastage with effective, targeted strategies, quantitative data would be required. In the absence of such data, however, countries could begin by implementing general programmes to educate the public on the moral, economic and environmental consequences of food wastage and on strategies to prevent food wastage.

- ***Enhance government support for innovative means of using food that is wasted in urban environments.***

To realise the full value of food, it is essential to extend food supply chains beyond the existing end point (i.e., consumers). In recycling, food is most valuable as food for human consumption; therefore, redistributing edible wasted food to the food insecure should be a priority for policymakers. Civil society projects to collect unsold or unconsumed food from retailers, the hospitality industry, communities and households for the purpose of such redistribution should be supported. Steps should be taken to ensure that the redistributed food is safe for consumption and that donors are not liable beyond the point of safe donation. A regulatory environment that finds a balance between food safety and an enabling environment for redistribution of unsold/unused food is therefore essential. For example, laws requiring the hospitality sector to dispose of food could be modified to allow licensed food collectors to redistribute the food. Furthermore, measures to encourage donation through tax incentives and disposal fees could be implemented.

If the unused food is inedible for humans, options to turn the food into energy and agricultural inputs should be explored. There are existing solutions, but they are at present largely small scale, and thus not economically efficient. Another significant

## **Box 2: Conceptualising food wastage: A viable approach for Southeast Asia**

As systems of producing and distributing food become more complex and intertwined, so too does the issue of food wastage. Food wastage occurs along a maze of supply chains and is spread over multiple borders before it reaches the plates of consumers. Taking a total supply chain approach is therefore essential in order to address food wastage effectively and sustainably. Within that approach, however, it may be useful to identify specific dimensions to guide research and policy actions.

The literature on food wastage traditionally distinguishes between 'industrialised' and 'developing' countries. However, this may not apply neatly to Southeast Asia. The industrialising and increasingly wealthy cities of Southeast Asia are situated in countries with agricultural sectors dominated by smallholder farming. A more feasible exercise for Southeast Asia may be to examine food wastage along 'urban' and 'rural' lines. Cities such as Singapore, Manila, Jakarta and Bangkok face particular challenges related to the retail and consumption stages, and have much to gain from comparing strategies to reduce food wastage. Likewise, food production and post-harvest supply chains, which are mostly found in the rural areas of Southeast Asia, could benefit from greater knowledge sharing and cooperative strategising among stakeholders.

While the division between urban and rural areas may be useful in the first instance as a conceptual starting point, overlapping dimensions such as urban and peri-urban agriculture would need to be explored further, as would the important linkages between urban and rural food wastage interventions.

Ultimately, food wastage must be addressed as a region, given the critical interdependencies both between countries, and between urban and rural food security stakeholders across borders. For example, Singapore and other urban hubs might consider transforming food waste inedible for human consumption into animal feed that could then be exported to meat producers in the region. This would provide a stable supply of feed amid ongoing global grain price instability and more frequent price hikes. While this process may have some initial economic drawbacks if the price of animal feed falls below the cost of transforming food waste, providing an affordable alternative to farmers in the region would bring down the production cost of meat, which would in turn benefit city dwellers. Such holistic, regional solutions to the problem of food wastage are essential for the mutual benefit of both urban and rural food security stakeholders.

area of research would be the development of viable technology for separating food waste from other commercial and household waste, given that this is currently a substantial operational hurdle. As a research and financial hub in the region, Singapore could play a leading role in developing innovative solutions that address such problems and considerations.

Policymakers should also consider costs and benefits in broader terms than the purely financial. While profitability will be a key factor in implementing sustainable schemes, the example of animal feed mentioned in Box 2 suggests that economic viability need not be the only measure employed; there may be uses for wasted food that are of value in terms of contributing to the sustainability of food, environmental or energy systems, and these should be given their due weight as well.

- ***Increase government support for research projects to quantify food wastage to provide a basis for policymaking.***

There is a gap in terms of research to measure losses and waste in key commodities (particularly fish, vegetables and rice), at various stages in supply chains, and across different geographical areas. Without such quantitative information, policymakers have little basis on which to set strategic targets. The challenge in conducting such research, however, is the lack of cooperation and transparency from key food supply chain stakeholders, particularly from private-sector and government actors. Given the benefits of enhanced knowledge on food wastage, policymakers would do well address this, and support and indeed encourage research in this area.

Policymakers should give strong consideration to supporting the methodological approach of 'life cycle assessments' of particular food commodities. Such assessments take entire food supply chains into account, providing not only quantitative data on the wastage of a commodity at various points along a supply chain, but also on its carbon and water footprint. An example of this type of research is a life cycle assessment of Australian mango done in 2009 which found that curbing losses and waste along the supply chain was the most effective way of reducing the fruit's environmental footprint.

The development of domestic or regional information systems to monitor post-harvest losses should also be considered by Southeast Asian policy stakeholders. A potential model is the African Post Harvest Losses Information

System (APHLIS) which offers estimates of losses for the cereal crops of East and Southern Africa. Southeast Asia could benefit from the development of a similar system for its crops, and in particular for rice, a crop considered critical to the region's food security.

## Conclusion

Food wastage has an impact on food availability and prices. Southeast Asia, which has to minimise its vulnerability to food supply shocks and price volatility in the face of population growth and urbanisation, would thus have to give greater priority to addressing such wastage. Policy strategies to address urban and rural food wastage should take a total supply chain approach in order to achieve systemic change. The fragility of Southeast Asia's food systems from an environmental perspective also adds significant weight to the rationale for holistic approaches to curbing food wastage. Finally, in the context of a lack of data on food wastage in Southeast Asia, cooperation through knowledge sharing and capacity building at the regional level will be of mutual benefit in order to promote food, environmental and economic security.

## About the Authors

**Professor Paul Teng** is Dean of Graduate Studies and Professional Learning, National Institute of Education (NIE); and Adjunct Senior Fellow (Food Security) at the Centre for Non-Traditional Security (NTS) Studies, S. Rajaratnam School of International Studies (RSIS), Nanyang Technological University.

He has over 20 years of experience on food security issues, having held positions at the WorldFish Center, Malaysia; the International Rice Research Institute (IRRI); and Monsanto Company. His awards include the Jakob Eriksson Prize in Plant Pathology. Prof. Teng is a Fellow of the American Phytopathological Society, and TWAS – The World Academy of Sciences. He is also Vice-Chairman of the International Service for the Acquisition of Agri-biotech Applications (ISAAA) and Chair of Asia Biobusiness Pte Ltd.

He has published over 250 technical papers and eight books, the most recent of which is *BioScience Entrepreneurship in Asia: Creating Value with Biology* (World Scientific, 2008).

**Sally Trethewie** is Associate Research Fellow with the Centre for Non-Traditional Security (NTS) Studies, S. Rajaratnam School of International Studies (RSIS), Nanyang Technological University, where she focuses on food and environmental security issues for the Centre's Food Security Programme. She holds a Master of International Politics from the University of Melbourne and recently co-authored a chapter for a handbook on International Political Economy.

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