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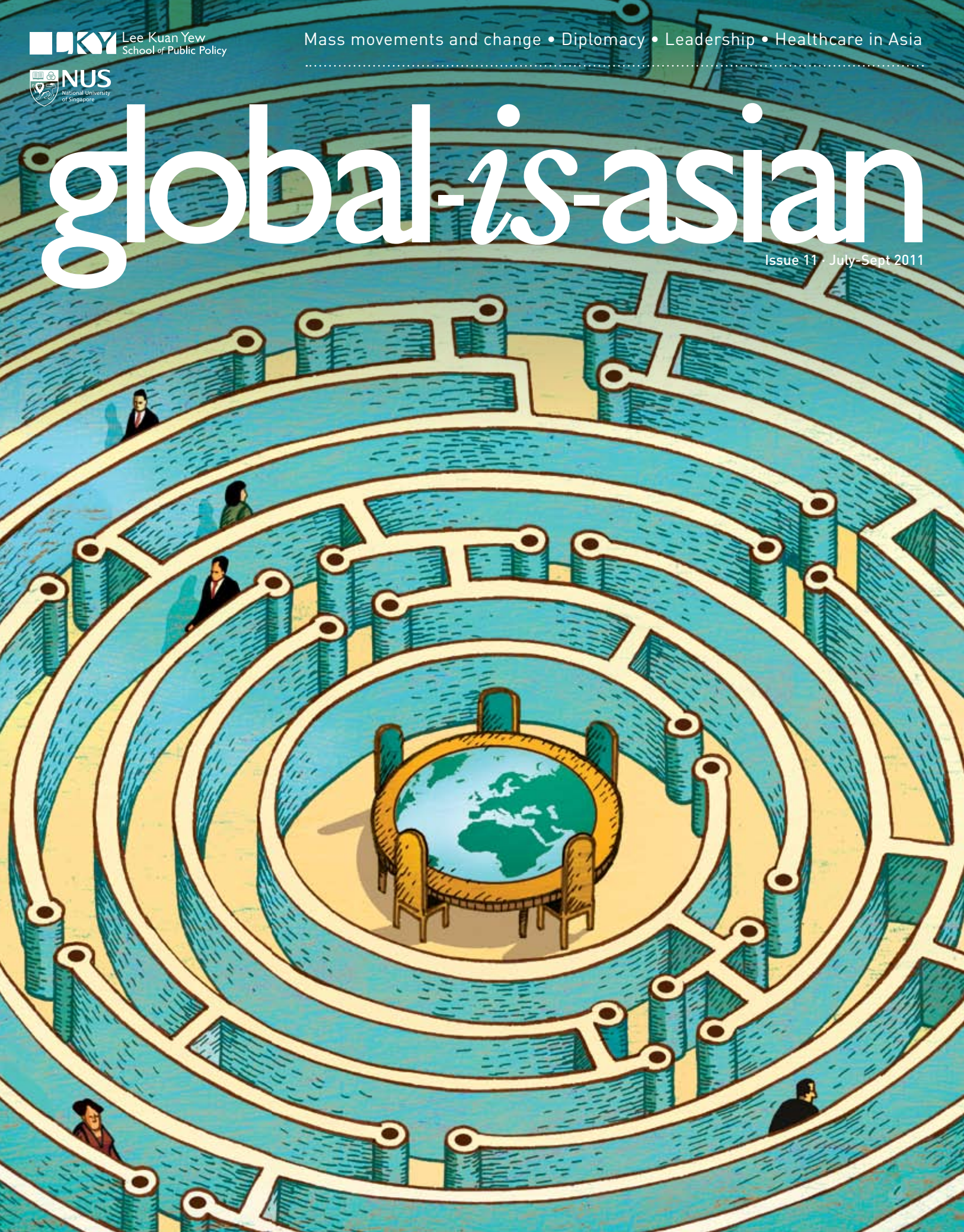

A holistic approach to formulating development policies

Incremental policy formulation within a restricted framework is no longer viable. To meet ever-rising expectations, innovative and holistic approaches to policy formulation are in order.

Text • Asit K. Biswas

Image: Paul Lachine

"Despite these close water-energy inter-relationships, there is not a single country in the world which has an energy policy that explicitly considers water requirements for its implementation, or a water policy that considers its energy requirements. Both assume somehow that the other resource would be available to meet its future production requirements."

Policy makers are faced with the problem of providing enough food, energy, water, and other necessities to the nearly 7 billion people globally, as well as how to sustain these resources as the world population swells to more than 9 billion people by 2050. At the same time, economic growth, technological innovation, better education, rising income levels, and the information and communications revolution are contributing to more pressure on governments to think out of the box to satisfy their people.

Anecdotal evidence suggests that past development policies are not working as well as envisaged, creating more pressure on governments to deliver sustained results. Past approaches to development, which are based on incremental policy formulation within rather restricted frameworks, are no longer tenable in the modern age if the ever increasing expectations of humankind are to be met. In their place, broader and more innovative approaches to public policy are needed.

Past development policy has failed because of the complexity in forecasting and understanding the implications of future changes in policy. The parameters determining the policies often change dramatically and differ widely from those initially assumed.

Danger of reductionism

During the past three centuries, science and institutions have mostly worked on the basis of a rugged reductionism. If a problem or issue was too big or complex, it was broken down further to aid understanding and analysis. For example, in the 16th century, all science was considered to be natural philosophy. As knowledge advanced, physics became a separate branch, to be followed by chemistry and biology. And when physics became too large a field of inquiry, it was subdivided into several different branches. Mirroring science, governmental institutions have also suffered from such reductionism. When bureaucracies became too big and cumbersome, they were split into different smaller institutions or departments.

Though such reductionism may have worked well over the past three centuries, the interconnectedness and complexity of issues affecting them in the modern era has made it difficult in practice to reduce a problem to its distinct parts and find an appropriate solution. In human development, the cross-cutting linkages and competing demands of energy, water, food, health and the environment has made policy making much more complicated than ever before in history.

This brings to mind a private discussion I once had with Indira Gandhi, the former Indian Prime Minister, in the early 1980s. I had asked her why India, after 35 years of independence, made limited progress in poverty alleviation and human development. After some reflection, she said that policy responses to solve one problem often created other unanticipated outcomes, and the sum total of these side-effects was sometimes equal to the problem that they were expected to solve, and on a few occasions even exceeded the original problem! Three decades on, her observations have become even more important.

Energy-water-food linkages

Currently, no form of energy can be produced without water. Equally, water cannot be used or produced without using a substantial amount of energy, and no food can be produced, transported and used without water and energy. One issue affects the other and is in turn affected by the others.

Globally, nearly 70 per cent of the world's water is used for agricultural purposes. In percentage terms, global agricultural water use is declining, even though in absolute terms, it is increasing. In countries such as the United States and France, the biggest user of water is thermonuclear energy for cooling purposes. While there is no doubt that water requirements for energy production have been steadily increasing in recent decades, there is regrettably at present no reliable data on what percentage of water is used by the energy sector for the world as a whole, primarily because water-energy interactions have been a neglected subject for decades and water for energy production has been basically free.

In the United States, where such data is available, water withdrawals for the thermonuclear energy sector increased from 492 billion litres per day in 1995 to 553 billion litres per day in 2005, the latest year for which such data is available. Given that thermoelectric generating capacity in the United States is expected to increase by 18 per cent between 2005 and 2030, water withdrawals for energy generation purposes are likely to be in the range of 425 billion to 523 billion litres per day, depending on advances made in technology and management practices that may be used. Thus, over the next three decades, there will be increasing competition for water among the domestic, industrial, energy and agriculture sectors, as well as for the water requirements of the ecosystem for nearly all countries of the world.

The International Energy Agency estimates that the primary energy demands of the world are likely to increase by more than half between 2005 and 2030, and developing countries will account for the lion's share of this increase. India and China will be responsible for 45 per cent of this increase.

Despite these close water-energy inter-relationships, there is not a single country in the world which has an energy policy that explicitly considers water requirements for its implementation, or a water policy that considers its energy requirements. Both assume somehow that the other resource would be available to meet its future production requirements. Whereas both China and India have clear energy production plans for the next two decades to sustain their economic development, neither country has a good idea where cooling water for energy generation will come from, or even if this quantum of water will be available, especially as competition for water requirements from other sectors is intensifying.

The problem becomes even more difficult where energy-water-food interrelationships are concerned. The role of biofuels and their impact on water, food and energy well illustrate the dilemmas faced by policy makers.

Biofuels conflict with other policies

In the era of high and volatile oil prices, biofuels are an attractive option to countries sourcing for alternative sources of energy. Fossil fuels are a major source of greenhouse gas emissions that contribute to climate change. Thus, there has been a strong push to find new forms of clean and low-carbon energy, especially for the transportation sector. Biofuels are deemed to satisfy these requirements, in addition to contributing to energy security. There are also secondary reasons for promoting biofuels, such as the creation of new markets for sugar, cereal, and oilseeds, which in turn could boost farm incomes and contribute to rural development. Superficially speaking, biofuels appear to tick all the right boxes.

Not surprisingly, many governments have taken a leap of faith to promote biofuel production heavily, without first assessing their beneficial and negative effects.

Heavy subsidies are provided for biofuel production to meet the energy requirements of the transportation sector. For instance, Brazil, the European Union, Japan and Indonesia hope to raise biofuel production by 10 per cent and China by 5 per cent by 2020, respectively, while the United States aims to raise biofuel output by 30 per cent by 2030.

Since energy prices are significantly higher than food prices, the promotion of biofuels has led to many unwarranted results. For example, in the United States, ethanol, a biofuel, accounted for only 8 per cent of transportation fuel output but consumed nearly 40 per cent of its maize crop. A report prepared by 10 international institutions, including the World Bank, the Food and Agriculture Organization of the United Nations, and the Organisation for Economic Co-operation and Development, for a G-20 meeting of agricultural ministers in June 2011, estimated that between 2000 and 2009, global ethanol production increased four-fold and biodiesel rose 10-fold. Biofuels now account for 20 per cent of the world's sugar cane production, 9 per cent of oilseeds and coarse grains and 4 per cent of sugar beet. If the current trend continues, the report estimated that the price of coarse grains could increase on an average by as much as 13 per cent per year between 2013 and 2017. Oilseed prices would increase by 7 per cent and vegetable oils by 35 per cent annually during the same period. The World Bank has estimated that rises in food prices alone pushed 44 million extra poor people into hunger in the second half of 2010. If food prices escalate further, the world hunger situation will be exacerbated.

If all current national biofuel targets are to be met, it is estimated that nearly 10 per cent of the global cereal production would have to be used. Alternatively, if food crop availability is to be maintained, huge amounts of extra land would have to be cultivated, which would require enormous amounts of additional water. There would also be a serious impact on water quality because of the additional use of agricultural chemicals which would leach into water bodies. Since such huge quantities of land and water are not available at present, present policies are likely to lead to a diversion of food crops for biofuel production. This would increase food prices by 15-40 per cent, which would have dire consequences for the world's poor. If all American corn used for ethanol production were to be used for food, it is estimated that global edible maize supply would increase by a mere 14%.

The report recommended that governments should "remove provisions of current national policies that subsidise (or mandate) biofuel production." However, Brazil, United States and other biofuel-promoting countries opposed the agreement to cut support for biofuels. The G-20 Agricultural Ministers finally agreed to study the relationships between biofuel production and food price escalation, ensuring that the status quo will continue indefinitely.

Though biofuels have been touted as the policy "silver bullet" which could enhance energy security by reducing reliance on fossil fuels and cut greenhouse gas emissions, they have in reality distorted markets, compounded world hunger, accelerated environmental degradation, increased water and land use, and encouraged food price inflation – far outweighing the purported benefits. If anything, the case of biofuels amply demonstrates why development policies should not be formulated in a narrow manner.

Where pressing issues of human development are concerned, policy makers need to show a sensitive appreciation of the myriad variables that could be affected by their policies and which could in turn impact them. The challenge for modern institutions is to maintain a healthy scepticism of the latest fads while adopting a holistic yet forensic approach to problem solving and policy making. GA

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