

Mapping the future

Scenario mapping aims to provide policy-makers with options for action. Warren Page and Rebecca Thyer report

PARTNER COUNTRIES: China, India **PROJECT:** ADP/2004/045: Exploring alternative futures for agricultural knowledge, science and technology **DESCRIPTION:** Researchers are working to model different scenarios to better prepare for changing circumstances **CONTACT:** Dr Mark Rosegrant, m.rosegrant@cgiar.org

Agricultural research, development and dissemination have played a key role in lifting agricultural productivity and food security as well as in reducing poverty. Scientific and technological advances made during the Green Revolution have had widely acknowledged benefits.

However, predicting the impacts that future agricultural knowledge, science and technology will have on food security, rural development and sustainability is not simply a matter of extrapolating past performances.

Future decisions and their impacts are inherently uncertain. However, by modelling different scenarios, research managers are better able to prepare for changing circumstances.

Systematic analysis of plausible scenarios has become a common decision-making tool and a range of scenarios, defining potential pathways for the adoption of agricultural technology, is being examined as part of an ACIAR-funded project with the International Food Policy Research Institute (IFPRI) and partners in India (National Council of Applied Economic Research) and China (China Center for Agricultural Policy).

This project aims to provide policy-makers with options for action, helping them to formulate appropriate policies and investment decisions on science, extension services and technology adoption.

The project leader, IFPRI's Dr Mark Rosegrant, says mapping future trends – including descriptive scenarios of current and likely trends and expected impacts – creates options for policy-makers. By providing a clearer understanding of possible trends and their implications, these options can help inform them of alternatives for investing in and supporting agricultural science.

Farmers are expected to be the main beneficiaries of the project in the medium and longer term, as the impacts of this research project will flow from policy and decision-makers through scientific research programs, extension services and finally to farmers and institutions involved in support of agriculture.

Trends include economic growth, population shifts and growth patterns and changes in public and private investment, particularly in extension services, within a broader context of changing sociopolitical environments.

Other important drivers include global climate change, changing dietary patterns and changes in government support policies and trading regimes.

Dr Rosegrant says that one of the real problems for policy-makers is assessing the impacts of policies over time and the consequences of these impacts beyond the specific sector for which they were intended, or the impacts of trends outside that sector.

“For example, a government-funded extension service may be reduced in size, but may also be the main pathway by which some exciting new technology was to be delivered to farmers,” he says. “By using descriptive scenarios we can build options that catalogue alternatives for delivering technology and disseminate this to the people making the policies that influence pathways to adoption.”

Alternative scenarios are being developed with scientists, policy-makers and farmers involved in the International Assessment of Agricultural Science and Technology for Development (IAASTD), which is working to assess the impacts of future agricultural knowledge, science and technology on hunger and poverty reduction in a sustainable fashion.

The expertise of several hundred scientists

FOR EACH PATHWAY THERE ARE LIKELY TO BE TRADE-OFFS AMONG THE ECONOMIC, SOCIAL AND ENVIRONMENTAL POLICY GOALS

and policy-makers who are participating in the IAASTD assessment will be available for this project. From this expertise, plausible scenarios will be developed to provide some guidance on how to manage potential uncertainties.

The project is basing its agricultural scenarios on those developed in the Millennium Ecosystem Assessment (known as MA scenarios), launched by UN Secretary-General Kofi Annan in 2001. This assessment, completed in 2005, helped to determine priorities for action on several international conventions relating to biodiversity, desertification and wetlands.

A key to the success of the assessment – and the reason for basing the project scenarios on it – was the use of rigorous testing in the four global scenarios developed.

Dr Helal Ahammad, a project team member

from the Australian Bureau of Agriculture and Resource Economics (ABARE), says analysing each scenario allows the team to look closely at pathways through which agricultural knowledge, science and technology are likely to impact on certain policy goals. “For each pathway there are likely to be trade-offs among the economic, social and environmental policy goals. It's important for policy-makers to be aware of these trade-offs in order to make informed choices regarding agricultural policies.”

The scenarios developed in this new project will cover agricultural development to 2050. Both quantitative and qualitative analysis of productivity and growth trends will be used to test implications on adoption pathways and broader economy-wide parameters, with a focus on implications for the poor.

Quantitative analysis of parameters such as changes in water-related technologies and efficiencies, climate variability and change, energy prices and population and income growth within the scenarios will help check the consistency of the alternative futures, provide relevant numerical information and generally enrich the scenarios by showing trends and dynamics not anticipated by the story-lines alone.

By including changes in water-related technologies and efficiencies, climate variability and change, energy prices, population and income growth in the scenarios, testing using quantitative analysis is possible. For example, a broad picture of how farmer welfare may vary can be determined by factoring in changes in productivity and price levels, based on food commodity supply-and-demand shifts examined in economic and climatic scenarios.

To help in this process, national economic models of India and China will be used. Both countries are among the fastest-growing in the world, yet each also has farmers that are still to receive some of the real benefits of agricultural knowledge, science and technology.

By analysing alternative pathways created in each scenario, the wider implications of trade and subsidy policies and their impacts on food security and production can be better defined. An understanding of these impacts can then be used to qualitatively test policy scenarios in today's real-world context. ◀