Engaging stakeholders in developing food security scenarios

There is a long history of using scenario analysis in climate and environmental studies, but it is only recently that this approach is being used to assess future food and nutrition security. Scenarios are storylines with a coherent set of assumptions that together describe plausible futures. They provide a means of dealing with the complex and uncertain issues around climate change, income development, technical change, and consumption patterns in the formulation of policies that are dependent on future expectations.

Researchers at Wageningen UR have been developing and using highly participatory scenario approaches to improve their understanding of food and nutrition security issues so as to involve and guide decision-makers at the national and global levels. Two scenario exercises are presented that show how stakeholders have been involved in different ways: as owners of a vulnerability problem among local fishing communities in India, and as opinion-makers to inform exploratory scenarios on global food security.

Participatory Vulnerability Analysis: Engaging fishing communities in Kerala, India

In India, the fishery sector plays a strategic role in food and nutrition security, especially in the coastal communities. Kerala, a state in the south-west region of India, is an important producer and exporter of fish. The fishery sector contributes substantially to the socio-economic development of the state and the country as a whole; however, it is believed to be at risk as a result of uncontrolled fishing. Climate change is expected to exacerbate this situation and adversely affect the livelihoods of those living in the coastal communities.

A Participatory Vulnerability Analysis (PVA, e.g., Smit and Wandel 2006) was conducted in Kerala in order to understand and assess the main drivers related to the vulnerability of fishery resources and climate change as well as determine how individuals perceive and respond to this changing situation. The research was part of the Indo-European Research Facilities for Studies on Marine Ecosystem and Climate in India (INDO-MARECLIM) project. It was sponsored by the European Union (EU) and the research programme Global Food Security and co-ordinated by the Nansen Environmental Research Centre India (NERCI) in Cochin, Kerala, India.

Here, the PVA methodology as developed by ActionAid (Chiwaka and Yates 2005) was used. The method was set up as a disaster management tool to carry out in-depth analyses in local communities to find out what makes them vulnerable and to seek

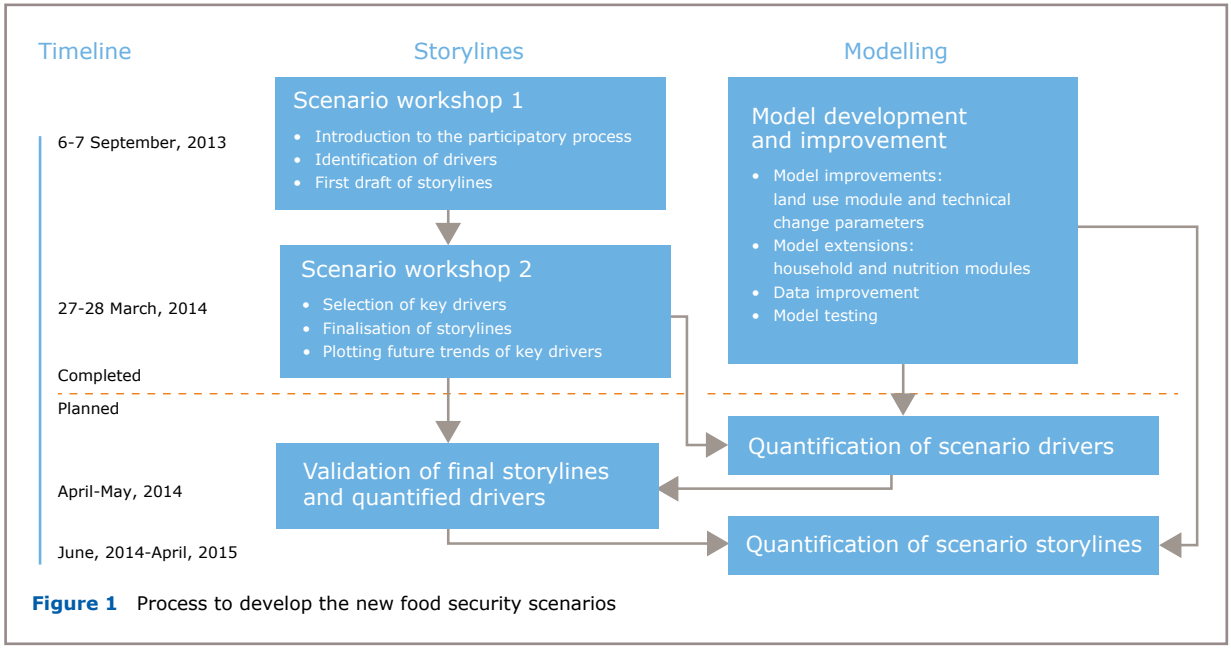

Figure 1 Process to develop the new food security scenarios

ways of helping them to cope with disasters. The tool is used to help people determine the causes of their vulnerability and develop an action plan. In the case study, the PVA involved analysing timeline data on the fishing communities, assessing how seasonality affects vulnerability, determining the institutional landscape and how the vulnerabilities affect or will affect the lives of the people in the communities. To gather data, well-known tools were used such as focus groups, timeline and trend analysis, seasonal analysis, and the problem tree analysis. As a result of using this process, the main factors identified as affecting the sector were: overexploitation and overcapacity associated with an increase in fishing effort and the mechanised unit; increased sea surface temperature; changes in the intensity and frequency of monsoon rains, and increase in salinity.

All of the groups studied were of the opinion that certain fish populations will continue to decline. However, their level of awareness regarding the potential future risk of climate change differed. The extent to which climate change might have an impact on their livelihoods did not seem to be of concern to them. Many in the community were more concerned with day-to-day survival.

During the focus group discussions (van Riel 2013), participants were asked the following scenario question: 'In the case of an extreme flood or tsunami event, how would you respond, what resources and/or systems are in place to cope with this?' Their response was that: 'We live for the present only, what happens will happen and we will face it then'. They continued by saying that: 'Awareness programmes need to be put into place and we need to be better educated and made aware of the impact of climate change on our lives and fishery resources'. The exercise has motivated the fisherman to get more schooling for their children.

The analysis showed the need to improve current management plans and strategies for dealing with the impending scenarios associated with climate change.

Story and Simulation scenario development on food security with opinion-makers

The Story and Simulation (SAS) approach is being used (Alcamo 2008), with support from the EU under the FOODSECURE project and the research programme Global Food Security, to develop and analyse a set of detailed scenarios of global food and nutrition security up to 2050. This methodology has also been used in the past to develop scenarios for the Millennium Ecosystem Assessment (MA) (Carpenter et al., 2005) on global ecosystem services and for the Intergovernmental Panel on Climate Change (IPCC) (Nakicenovic et al., 2000) on greenhouse emissions.
The strength of the SAS approach is in the way it combines participatory qualitative and analytical quantitative methods of scenario building. The core of the SAS approach is: (1) the development of 'storylines' that describe potential futures during a series of workshops and meetings with the active involvement of key stakeholders, and (2) the quantification of the storylines with the use of modelling tools to make the various pathways explicit by means of numerical data. The 'ideal' SAS procedure involves ten steps, including feedback loops and iterations to revise the

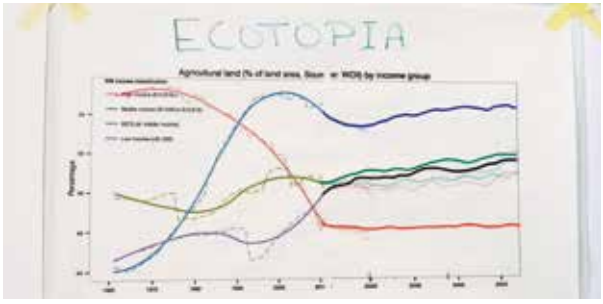

Figure 2 Example of output from the FOODSECURE Scenario workshops

storylines and model quantification and enhance their coupling (Alcamo 2008).
An important advantage of the SAS approach is that it gives stakeholders the opportunity to influence the development of scenarios and verify the applicability of the models. The active involvement of key stakeholders such as policy-makers and experts in the scen€ario building process also adds to the legitimacy of the scenario exercise. Further, the fact that state-of-the-art computer models, which have undergone peer review, are used in combination with expert knowledge means that scenario narratives are checked for consistency and that the results of the analysis are more credible.
The main constraint in using the SAS approach has to do with the difficulty encountered in translating qualitative knowledge into quantitative knowledge and back again. Scenario storylines consist of rich narratives and/or even diagrams and pictures that describe a complex system of global and local drivers. To transform this information into quantitative information that can be used in the model is quite challenging and sometimes bold assumptions have to be made.

Towards new food security scenarios

Figure 1 gives a visual impression of the main phases of the SAS approach process. Two workshops were held in Bruges and Prague to develop storylines for four scenarios. The workshops brought together 20 high-level representatives from a number of organisations and businesses in Europe and other regions, including the Organisation for Economic Co-operation and Development (OECD), Copa-Cogeca, European Commission, Biovision Foundation, Ethanol Europe, Oxfam, Action contre le Faim and BioCoop.
Workshop activities included structured assignments and working group discussions to identify key driving forces of global food security as well as develop comprehensive storylines for four potential futures, towards 2050. Key drivers that were selected included: population growth, technical change, income per capita, land use and change in diets. Even though participants underscored the relevance of global drivers and solutions, they were also interested in a plausible scenario around a more local food supply.
Parallel to the stakeholder process, modelling teams have been preparing and improving on the computer models for the quantification of these drivers and scenarios. In total, three different models (combinations) will be used to quantify the scenarios: (1) MIRAGE (International Food Policy Research Institute (IFPRI)), (2) GLOBIOM (International Institute for Applied Systems Analysis, (IIASA)) and (3) MAGNET-IMAGE (LEI Wageningen UR and the Netherlands Environmental Assessment Agency (PBL)). All of these models have global coverage and can make projections on, for example, agricultural production, food prices and consumption, given assumptions on a number of driving forces.
In the next phase, the future trends of the main drivers, which were plotted for each scenario by the stakeholders (Figure 2), will be quantified at the country level for each of the scenarios. When this is completed, a webinar will be organised with the stakeholders to validate the final storylines and the related set of quantified drivers. The final phase will involve the modelling of the four storylines with the models that feature in the project.

Future developments

Both scenario exercises show the importance of engaging with stakeholders in the process of grappling with future uncertainty around food security and climate change. The vulnerability analysis highlighted the challenges fishing communities face in Kerala. The analysis also pointed to the need for state authorities, the affected communities and other key stakeholders to come together to discuss future climate change related events so that they can take appropriate action to mitigate their effects as well as develop food security strategies. Within the FOODSECURE project, it is envisaged that the scenario storylines and model outcomes will be used for an exercise with policy-makers from EU countries to discuss and evaluate potential policies that can positively contribute to global food and nutrition security. As a follow-up to these activities, representatives of local communities and the European Commission or other 'global players' will participate in a scenario exercise for exploring and discussing their stakes in future food and nutrition security.

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