FUTURE SCENARIO TESTING

Introduction

This chapter outlines the topic of future scenario testing. It describes how scenarios are increasingly being used to outline potential future realities. This chapter reviews socio-economic variability in the context of story boards for Foresight Futures (dti, 2002).

Future Scenario Testing

Given the complex interaction of the estuary with other socio-economic changes on and around the estuary, scenarios are increasingly being used to project possible future realities. Hence, one considers what conditions are likely to prevail under different development scenarios. This then allows a particular development to be tested under conditions derived for a number of different "future worlds" and provides a measure of the robustness of the predictions to the inherent uncertainty (dti, 2002). Typically "worlds" are constructed in relation to two drivers: social values (x-axis) and systems governance (y-axis), Figure 1. Social values reflect social and political priorities and the economic activity that results and range from individual, consumer, based values through to more community-based values. Governance relates to the structure of government and the decision making process. It ranges from autonomy, where power remains at a national level, to interdependence, where power increasingly moves to international institutions. The scenarios are presented as story lines, setting out general trends in a number of areas including the economy, employment, regional development, health, welfare, education and the environment. These are summarised in terms of a number of indicators, which provide a measure of how each issue may vary under the different scenarios. For instance, in a World Market it may be that sea defences are affordable and given a high priority, whereas, under Local Stewardship, maintaining the local environment is the highest priority, so the saltmarsh and mudflat are preferred over sea defences.
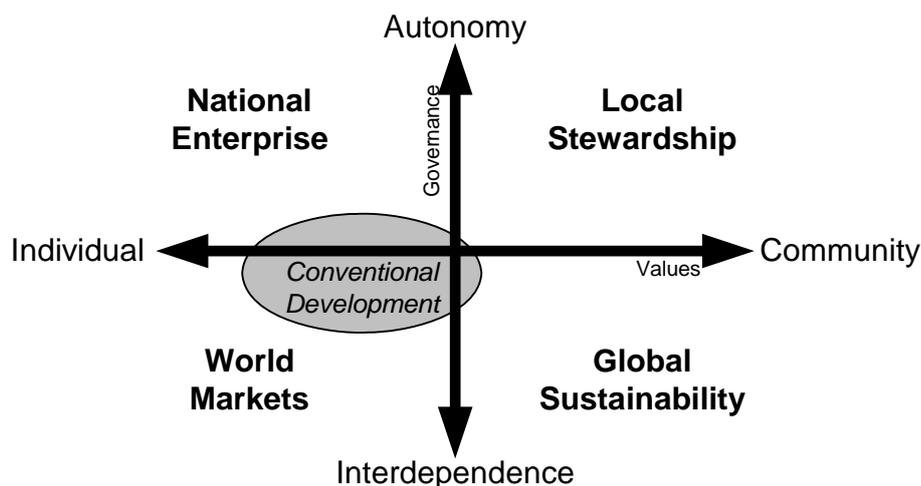

Figure 1.   Four futures scenarios (dti, 2002)

This is an approach that has been adopted widely in the studies of climate change and related impacts (IPCC, 2002; Hulme *et al.*, 2002). The results from these high level, regional/national studies can then used to define how forcing conditions, in the particular estuary system being studied, may change over time, as a basis for carrying out a series of model runs (Ledoux *et al.*, 2002). An example of the structures or story boards used in this type of analysis is given in the example below, taken from a Foresight study into the future of flood and coastal defences in UK.

Example of Future Storyboards Taken From UK Study of Flood and Coastal Defence

The four Foresight Futures that occupy the four quadrants shown in Figure 1 are summarised in Table 1 and Table 2. Further estimates of future socio-economic parameters are available from dti (2002). Further details about the Foresight Flood and Coastal Defence study can be found at: http://www.foresight.gov.uk/fcd.html.

Table 1.   Summary of Foresight Futures (dti, 2002)

	World Markets	National Enterprise	Global Responsibility	Local Stewardship
Social values	Internationalist, libertarian	Nationalist, individualist	Internationalist, communitarian	Localist, co-operative
Governance structures	Weak, dispersed, consultative	Weak, national, closed	Strong, co-ordinated, consultative	Strong, local, participative
Role of policy	Minimal, enabling markets	State-centred, market regulation to protect key sectors	Corporatist, political, social and environmental goals	Interventionist, social and environmental
Economic development	High growth, high innovation, capital productivity	Medium-low growth, Low innovation, Maintenance economy	Medium-high growth, high innovation, resource productivity	Low growth, low innovation, modular and sustainable
Structural change	Rapid, towards services	More stable economic structure	Fast, towards services	Moderate, towards regional systems
Fast-growing sectors	Health and leisure, media and information, financial services, biotechnology, nanotechnology	Private health and education, Domestic and personal services, Tourism, Retailing, Defence	Education and training, Large systems engineering, New and renewable energy, Information services	Small-scale manufacturing, Food and organic farming, Local services
Declining sectors	Manufacturing, agriculture	Public services, civil engineering	Fossil fuel energy, Traditional manufacturing	Retailing, tourism, financial services
Unemployment	Medium-low	Medium-high	Low	Medium-low (large voluntary sector)
Income	High	Medium-low	Medium-high	Low
Equity	Strong decline	Decline	Improvement	Strong improvement

Table 2. **Snap shot statistics for 2010 from Foresight Futures (OST 2002)**

	Today	World Markets	National Enterprise	Global Responsibility	Local Stewardship
GDP growth per year	2.5%	3.5%	2%	2.75%	1.25%
Total investment - % of GDP	19%	22%	18%	20%	16%
Agricultural activity (% of total activity)	2%	1%	2%	1.5%	3%
Newly developed land - hectares per year	6500	6000	4500	3000	1000
Primary energy consumption (tonnes of oil equivalent)	230 million	280 million	270 million	230 million	230 million
Primary energy consumption - average change per year		+1.7% pa	+1.5% pa	+0.1% pa	+0.1% pa

There is no direct correspondence between the UKCIP02 scenarios and the Foresight Futures 2020, not least because the Foresight Futures are specifically aimed at the UK whereas the emissions scenarios used in UKCIP02 are *global* emissions scenarios. However, an approximate correspondence can be expected, as shown in Table 3.

Table 3. **Correspondence between UKCIP02 scenarios and Foresight Futures (Hall *et al.*, 2007)**

SRES	UKCIP02	Foresight Futures 2020	Commentary
B1	**Low emissions**	**Global Responsibility**	Medium-high growth, but low primary energy consumption. High emphasis on international action for environmental goals (e.g. greenhouse gas emissions control). Innovation of new and renewable energy sources.
B2	**Medium-low emissions**	**Local Stewardship**	Low growth. Low consumption. However, less effective international action. Low innovation.
A2	**Medium-high emissions**	**National Enterprise**	Medium-low growth, but with no action to limit emissions. Increasing and unregulated emissions from newly industrialised countries.
A1F1	**High emissions**	**World Markets**	Highest national and global growth. No action to limit emissions. Price of fossil fuels may drive development of alternatives in the long term.

This document has briefly outlined the importance of future scenario testing, particularly for climate change. It briefly mentions the Foresight futures and UKCIP02 studies. There is also particular reference to socio-economic indicators.

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