Scenarios for Environmental Planning

Planning for Environmental Change

7-12-10

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Today's lecture

- Introduction to scenarios
- Drivers of change
- The EcoCities scenarios
- Application of scenarios in practice
  1. IPCC climate change scenarios
- Conclusions
“We can either stumble into the future and hope it turns out alright or we can try and shape it. To shape it, the first step is to work out what it might look like.”

_Stephen Ladyman MP, January 2006._
Forecasting the future is not easy!

- “There is no reason anyone would want a computer in their home.” Ken Olson - Head of Digital Equipment Corp (1977)

- “Stocks have reached what looks like a permanently high plateau.” Irving Fisher Economic Professor Yale University (1929)

- “With over fifteen types of foreign cars already on sale here [the US], the Japanese auto industry isn’t likely to carve out a big share of the market for itself.” Business Week (1968)

- “A rocket will never be able to leave the Earth's atmosphere.” New York Times (1936)

- “There is not the slightest indication that nuclear energy will ever be obtainable.” Albert Einstein (1932)
What are scenarios?

- Scenario – “that which is pinned to the scenery.”
- “An outline or model of an expected or supposed sequence of events”
- “A story about what happened in the future.”
- “The art of strategic conversation.”

- Not predictions of what is going to happen.
- Probability not ascribed to each scenarios.
Scenario functions and benefits

- Envisaging possible futures and determining their implications and consequences.
- Scenarios help identify turning points, key decisions, indicators, early warnings of change.
- Decision aiding, handling uncertainty, challenging perceptions.
- A process and a product
Scenario development and application

- Scenario planning in the military to develop strategic plans to address possible events.

- Scenario planning techniques for business were originally developed by the RAND Corporation and Royal Dutch Shell in the 1970s.

- Scenarios are used in the public sector – Foresight (UK government).

- Scenarios are used for environmental planning and management (IPCC, Environment Agency).
Scenario development methods

- Quantitative and qualitative approaches
- ‘Genius forecasts’
- Expert Groups – workshops, Delphi surveys
- Trend analysis
- “Modelling” tools - simulation, cross-impact method, gaming
Drivers of change

“The future’s already arrived. It’s just not evenly distributed yet.” William Gibson

- Factors with the potential to exert a significant influence over the future.
- Drivers can change the direction of entrenched trends e.g. energy generation.
- Variation in direction of and interaction between drivers forms the basis of developing scenarios.
Drivers of change – blending knowns and unknowns

“There are known knowns. These are things we know that we know. There are known unknowns. That is to say, there are things that we know we don't know. But there are also unknown unknowns. These are things we don't know we don't know.”

Donald Rumsfeld
Drivers & uncertainties

Impact / significance

Uncertainty

Inevitable

‘Wild cards’

Key drivers of change

Source: Joe Ravetz
Scenario creation method – Eco Cities

- Desk top analysis
- Interviews
  - Develop drivers ‘long list’
  - Develop drivers ‘short list’
  - Scenario creation
    - Scenario testing and refinement
    - Final reporting and dissemination
  - 2 workshops
  - Scenario testing workshops
    - Bruntwood and Manchester CC
The growth and development of Greater Manchester (GM): key drivers of change

- Population and demographic change
- The nature of technological change
- Patterns of economic growth
- Social dynamics in the city
- State of the economy
- Form and functioning of critical infrastructure
- Governance, regulation and legislation
- Values and consumption patterns of citizens
- Availability and use of natural resources
- Climate change direct/secondary effects
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Projected changes in shares of world GDP in selected countries and regions

Source: Ponset 2006
Largest city: New York (12.34 million)
30th largest city: Glasgow (1.76 million)

Source: UN World Urbanisation Prospects 2009 revision
Image: Nick Scarle (University of Manchester)
Largest city: Tokyo (26.61 million)
30th largest city: Lima (3.70 million)

Source: UN World Urbanisation Prospects 2009 revision
Image: Nick Scarle (University of Manchester)
Largest city: Tokyo (34.45 million)
30th largest city: Hong Kong (6.67 million)

Source: UN World Urbanisation Prospects 2009 revision
Image: Nick Scarle (University of Manchester)
Largest city: Tokyo (37.09 million)
30th largest city: Chicago (9.94 million)

Source: UN World Urbanisation Prospects 2009 revision
Image: Nick Scarle (University of Manchester)
Projected GVA growth in NW England
(by sub-region)

In ECOSEG (2008) Stage 1 – Environmental capacity themes
Household projections for Greater Manchester Districts

Source: Communities and local government: Household estimates and projections, by district, 1981-2031
Projected water supply/demand balance for NW England

The EcoCities scenarios

- Two scenarios were created
  1. Long Descent
  2. Upward Spiral
Application of the EcoCities scenarios

- The EcoCities project is focusing on adaptation to climate change impacts in Manchester
- Scenarios > futures perspective to the project
  - Complement long term climate change projections
  - Changing patterns of exposure and vulnerability to climate change impacts
  - Supporting the proposal of adaptation responses
Land use change projections

- Land use dynamics – complex and exhibit self-organising behaviour
- Planners/policy makers influence land use change

Projections for the Netherlands
Scenarios in practice – environmental planning and management

- Scenario frameworks are used extensively in environmental management – national, EU and global scales.

- Exploring the outputs of scenario applications.
  1. Intergovernmental Panel on Climate Change (IPCC).
IPCC : Special Report Emissions Scenarios (SRES)

- Uncertainty in future greenhouse gas emissions levels (GHGs) > scenarios developed to aid climate modelling.
- The scenarios address the main driving forces of future emissions – demographic, technological, economic, social, environmental.
- SRES consists of four different narrative storylines
- The scenarios include a range of emissions for relevant GHGs – used by climate modellers to make projections.
SRES scenarios

- **A1 (A1F, A1T, A1B):** A world more integrated – economic unity
- **A2:** A world more divided – regional winners and losers.
- **B1:** A world more integrated and environmentally friendly – ecotopia.
- **B2:** A world more divided and environmentally friendly - green enclaves.
Emissions levels under the IPCC scenarios

(a) A1

(b) A2

(c) B1

(d) B2

Global carbon dioxide emissions (GtC/yr)
The value of the IPCC SRES scenarios

- The scenario outputs are used in the running of climate models.
- They can assist the consideration of climate change impacts, mitigation measures, vulnerability and adaptation responses.
- The scenarios provide a long term context for near term analysis and decision making.
- Scenarios demonstrate that there is an opportunity to address the threat of climate change.
CO2 emissions (1990-2007) relative to IPCC scenario projections
“Given the reluctance, at virtually all levels, to openly engage with the unprecedented scale of both current emissions and their associated growth rates, even an optimistic interpretation of the current framing of climate change implies that stabilization much below 650 ppmv CO2e is improbable.”

(Anderson and Bows 2008)
Conclusions

Scenarios are useful as:

1. A *process* of development and discussion:

2. A *product*, which then leads to more development and discussion by others….

• Anticipation
• Participation
• Vision
• Action
Conclusion – value of scenarios for environmental planning and management

- Many environmental problems have socio-economic causes (which are difficult to predict)
- Environmental planning and management is a long term exercise – a futures perspective is vital
- Decisions taken in the short term can have long term consequences
Conclusions

- Scenarios provide a means of testing strategies against uncertain future developments.
- Scenarios provide a means of securing engagement in environmental planning and management.
- Scenarios can usefully challenge peoples' perceptions/assumptions of how the future may unfold.
Future quotes

- "If I had asked people what they wanted, they would have said faster horses." (Henry Ford)

- “In times of change, learners inherit the earth, while the learned find themselves equipped to deal with a world that no longer exists.” (Eric Hoffer)

- "The future belongs to those who prepare for it today." (Malcolm X)

- "The empires of the future are the empires of the mind." (Winston Churchill)