Forestry Commission

Risks and Uncertainties

Chair: Roger Swift

Rapporteur: Wilma Harper

Effects on forest ecosystems

What are the most likely effects of climate change on forest ecosystems?

Assumed

- 50 year time horizon

Take as given

- Increase in CO2 and other GHGs
- Increase in temperature
- Changing patterns of precipitation

All these will have direct and indirect impacts

Effects on forest ecosystems

Disturbance factors

- Biotic - Pests, diseases, invasives
- Physical – fires, drought,floods, storms(?)

- Melting permafrost

Forest(ry) impacts

- Species composition
- Commercial species
- Competitiveness N/S
- Tropics/boreal

Effects on forest ecosystems

Human impacts

- Population pressures
- Governance, ownerships,
- Forest laws, land management
- Anthropogenic fires
- Level of development

Deforestation – cause not effect of climate change

Importance and likelihood

Which risks are the most important and how likely are they?

Depends – on where you are and the extent of climate change

Importance and likelihood

Deforestation - happening and significant

- Forest fires
- Melting permafrost

Both have amplifying effects

- Drought, pests and diseases
- Increased stress on trees – inter-related

Magnitude depends on climate change effects

What do we need to know?

What do we know and what more do we need to know?

- Magnitude and impact of the drivers of CC
- Baseline for measuring change
- Limiting factors for growth
  - CO2 fertilisation
  - Nutrients
  - Water balance
  - Others?
- Interacting effects
- Soil processes

What do we need to know?

- Scaling up from experiments
- Evaluate models
- Translating models to relate to the real world

How to respond?

How should we respond to the perceived major risks?

- Continue research
- Incentives to prevent deforestation
- Effective alternatives
- Alleviate poverty

How to respond?

- Apply existing knowledge of SFM
- Better “tech transfer”
- Locally appropriate systems
- Adaptive education
- Ensure decision makers understand the links between forests and climate change

Monitoring

How good are our monitoring systems to inform management decisions?

- Identify and concentrate on “hot spots”
- Monitor GHG fluxes
- Use of remote sensing – military partnerships?
- Integrated networks of sensors
- Influence and improve the interface between scientists, policy makers and on the ground delivery

- “What decisions will this information help us make?”

Resilience

How resilient or flexible are forest ecosystems to changing environmental conditions?

- Need to understand the whole system
- Soil micro-organisms may adapt quicker
- Tree species
  - Some fragile with limited genetic base or climatic tolerance
  - Others more variable
- Barriers to natural migration N/S or E/W
- Speed of evolution c.f. evolution or migration
- Local nativeness

Catastrophic events

What is he likelihood of a catastrophic event?

- Climate change science uncertainties

- Catastrophic effects on forests – Amazon
- Tipping points
- Capacity to respond or recover may depend on resources

Responding to risk

- Terminate
- Transfer
- Tolerate
- Treat

How bad are we prepared to let things get before intervening?

Do we take a precautionary approach?

Tipping point?

Mosi-oa-Tunya