DPSIR, Indicators and Forest Ecosystem Services

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Context

- The role of ecosystem service indicators in shaping and informing policy is becoming a major area of interest and debate.

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A role for the Montréal Process?

- The Montréal Process may be well placed to contribute to this discussion.

- Increase the uptake and impact of the existing C&I framework through a deepening understanding of forest ecosystem services and use of DPSIR approaches.

- Intent of the Montréal Process …

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Ecosystem services and system dynamics

- The attractiveness of the concept lies in the use of systems dynamics to describe complex forest ecosystem functions and processes and their linkages to human wellbeing
- The concept of forest ecosystem goods and services has become widely embraced by forest policy makers, forest managers and the wider forest research community.
- How do we make sense of it… ?
- How do we tell compelling stories…??

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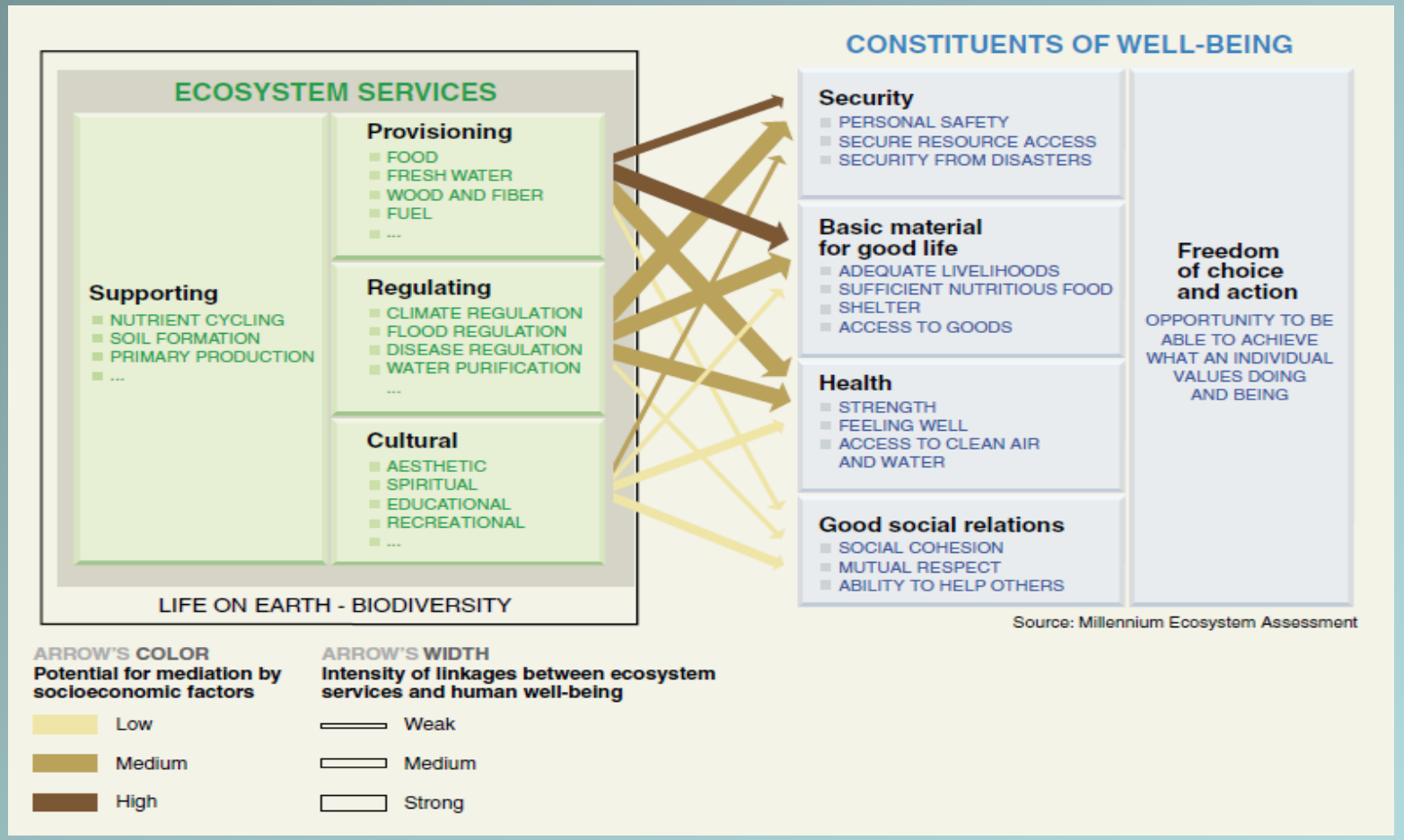
Millennium Ecosystem Service Assessment



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Montréal Process indicators and the MEA

- Strong link between MEA and MP-C&I

- The DPSIR approach is increasingly being used to rationalise the complex interactions present in ‘causal’ relationships associated with change in forest ecosystems generated by human activity.

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Making sense of MEA in decision-making

- Highly complex and explorative.
- Emergence of ecosystem cascades …

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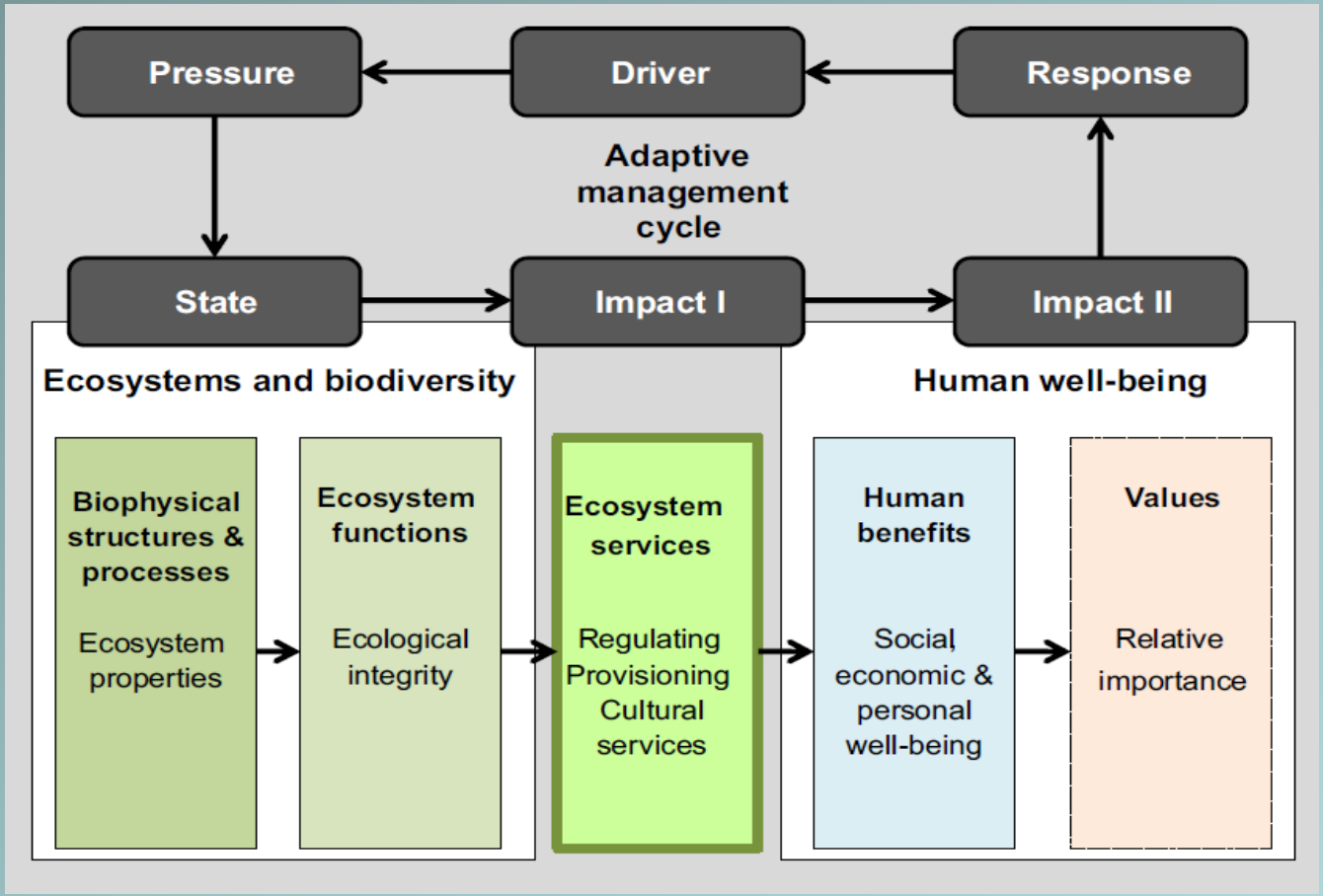
DPSIR and ecosystem service cascades



Müller, F., Burkhard, B., 2012. The indicator side of ecosystem services. Ecosystem Services 1, 26-30.

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Using indicators in DPSIR approaches

- Indicators may be used at all stages of the DPSIR approach. Their value being directly related to:
- The indicator being a true measure of the 'object of interest';
- Robust ecosystem service based rationales to support indicator selection;
- The availability of data;
- An awareness of uncertainties and the reliability of indicators;
- Optimal use of groups of related indicators and data; and,
- The ability to link indicators in meaningful causal relationships

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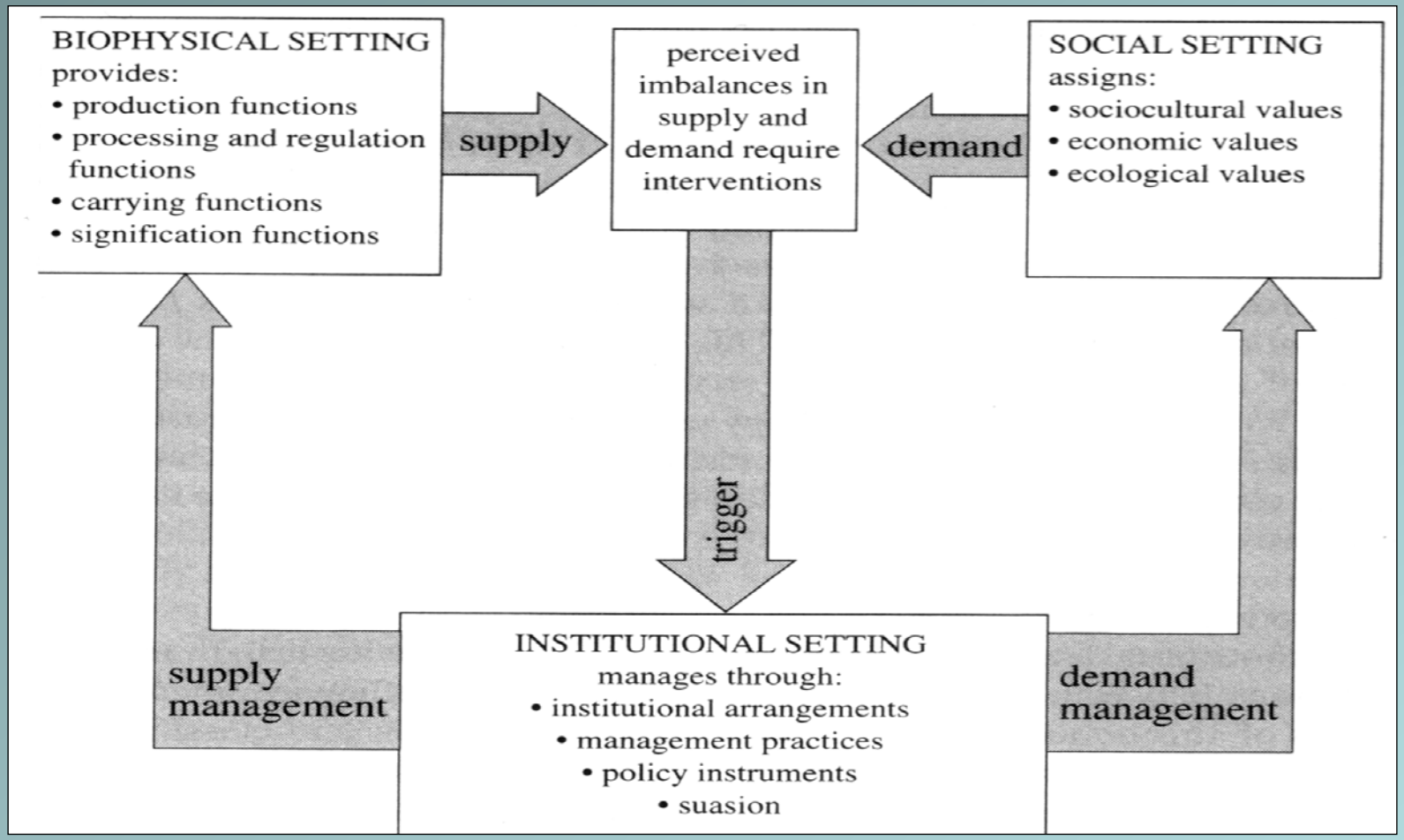
Indicators in supply and demand relationships

(Slootweg et al. 2001)



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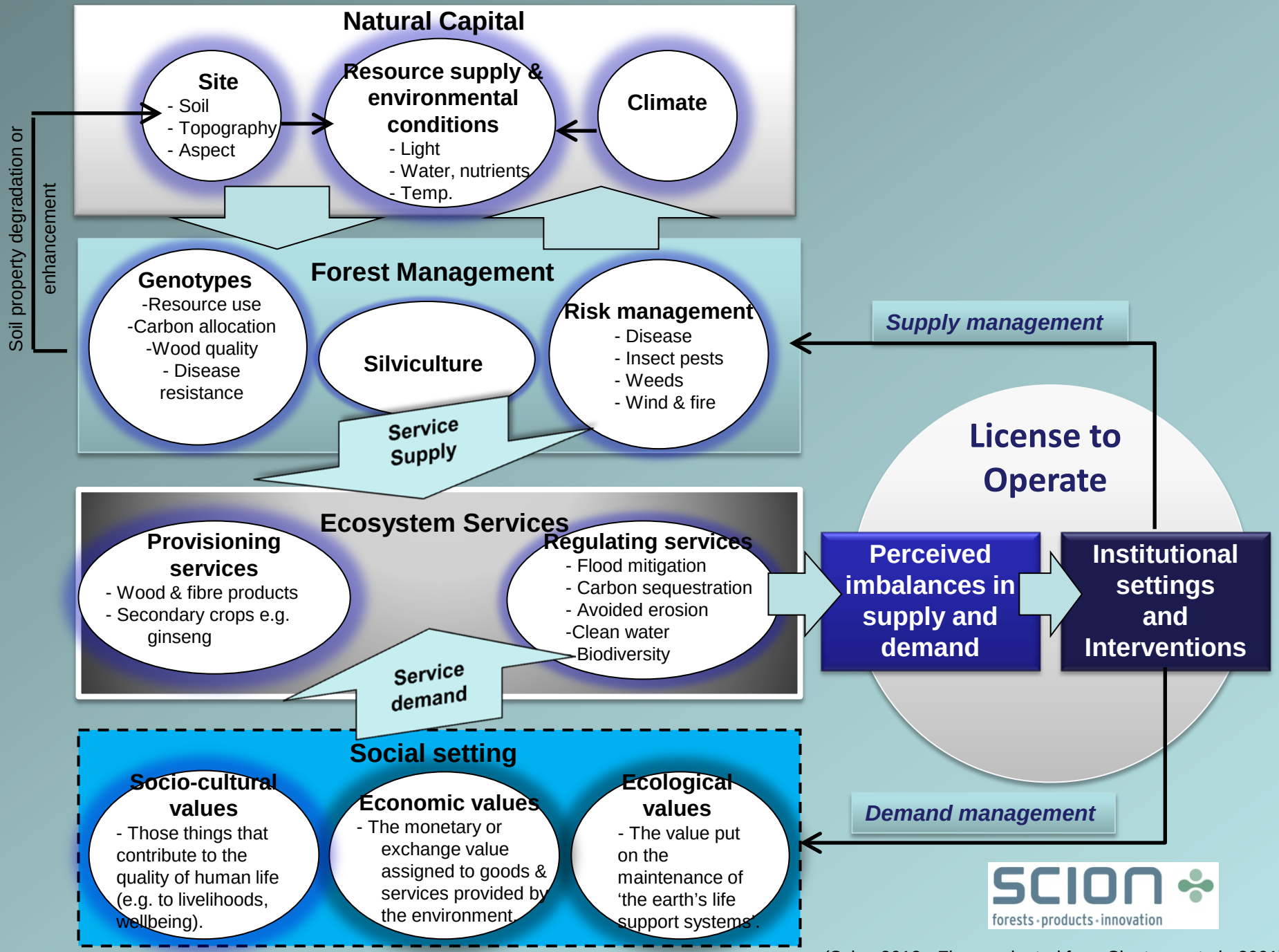
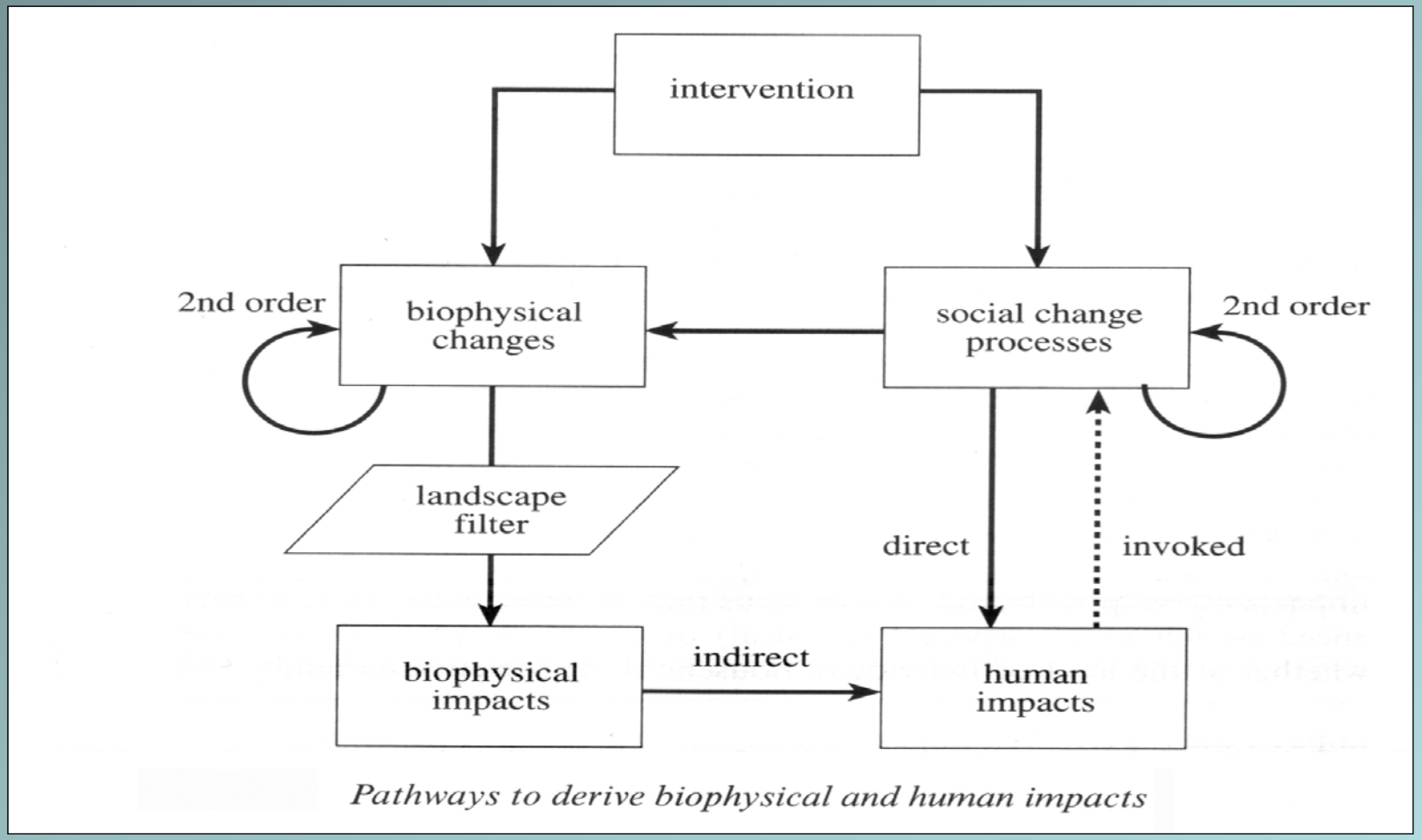


(Scion 2012 - Figure adapted from Slootweg et al., 2001).

Indicators in shaping and evaluating interventions

(Slootweg et al. 2001)



Pathways to derive biophysical and human impacts

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… of effects and impacts

- All environmental impacts are ultimately social impacts

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Mapping flow-on effects

Biophysical changes	*Impact/issue*	*Effect/outcome*	*Social/economic/cultural changes*	*Human impacts*	*Flow-on impacts*
Loss of physical support functions for natural forest flora & fauna (landslide etc.). Depletion and ecosystem performance	Ecosystem degradation or destruction (C1,3,4)	Loss of habitat (C1.1, 1.2, 1.3a) Reduced forest area & forest production (C6.1) Changes in supply of key flora and fauna (C1.2,6.3)	Reduced availability/accessibility of wild foods (C6.3) Reduced availability of forest materials/fibres etc. & chemicals (C6.3) Loss of natural pharmaceuticals /medicines (C6.3, 6.5) Loss of biodiversity (C1.1, 1.2) Loss of recreational opportunity (e.g. hunting, walking, relaxing) (C,6.3, 6.4)	Nutrition/ health effects (C6.5) Loss of cultural practises and associated knowledge (6.5) Reduced independence /self-reliance (C6.3) Changes in livelihoods strategies (6.3)	Reduced individual and collective health & wellbeing (C6.5) Reduced quality of living environment/amenity, and sense of place (C6.5, 6.3) Reduction in cultural integrity & identity (C6.5) Psychological and spiritual stress/loss (6.5). Loss of local and regional cultural diversity (6.5).

Source: Scion, 2012, The Waiapu River Catchment Report, Scion, Rotorua.

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Questions for discussion

- *What are the benefits of an ecosystem service/DPSIR approach to the Montréal Process (and to soil and water reporting?)*
- *How may the existing Montréal Process C&I framework be used within a forest ecosystem service/DPSIR approach?*
- *The need for worked examples??*

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