



Food *versus* energy: competition on land resources !

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Development phases in forestry

- Forest fires
- Clear cuts – mechanical approach
- Continuous growing – intelligent harvesting – eco-efficient approach
- Smart cultivation – smart harvest – smart product design
- Forest & ITC

Development of the field

- Self sufficient farms
- Industrial specialized farming
- Extensive farming
- Organic farming
- Set aside of the field areas
- Keeping up the neglected (set aside) areas for the future
- Escape from reforestation

FOREST ENERGY >< FIELD FOOD

- Food from field and forest
- Energy from field and forest
- Fiber from field and forest
- Pharmaceuticals from field and forest
- **Contrast is not relevant in the future - or we should avoid that!**
- The biomaterials and bio-energy sector can provide stability in agricultural markets. If occasional overproduction for the food sector can be used and is not wasted, food security may increase.
- **'Agroforestry' receives a new meaning**

Cascading is becoming a key word

- **“a strategy for using raw materials or the products made from them in chronologically sequential steps as long, often and efficiently as possible for materials and only to recover energy from them at the end of the product life cycle” (taken from German Federal Environment Agency) . found in Nova Paper: Michael Carus Biobased economy in the EU27, 2012**
- Wood, as a raw material, is used sequentially for materials and then for energy use (e.g. solid wood furniture, chipboard, recycled chipboard, burning)
- Food portion – recombined portion – feed – biogas - fertilizer

Many roads towards a more cascading

- Removing barriers and subsidies that play against cascading use.
- Turning the RED into a Renewable Energy and materials Directive – allows for incentivising biomass application in the materials sector on the same conditions as in the electricity/fuel sector.
- Many food regulations need reconsidering.
- Market development measures to create demand are helpful. For example by bio-preferred programs from public authorities (like in US) or by setting targets for uses in the material and chemical sector, similar to RED.
- Technology development: turn public investments in Research and Innovation even more into bio-refineries and other technologies that improve cascading use.
- Better logistics/infrastructure to facilitate cascading use

EU bioeconomy panel: Four pillars are needed:



1. Increase the EU's supply of sustainable and competitive biomass by mobilizing the commitment of regions. Introduce Sustainable Biomass Regions to produce raw materials for food, feed, materials and energy.

Sustainable Biomass Regions would share three principles:

- (i) a joint focus on greenhouse gas reduction, **adequate land use, prevention of soil degradation and recovery programs when needed, restoration of degraded lands or forests.**
- ii) intention to optimize agricultural, forestry and marine output, thus contributing to an increasing and competitive supply.
- (iii) a regional differentiated strategy -according to natural (climate zone, soils, biodiversity), social or economic conditions - to prevent environmental harm and to facilitate social and economic growth.

Sustainable Biomass Regions would have in place a set of rules *and* surveillance that ensure implementation and compliance of these principles.

2. Facilitate the establishment of Cascading Production Chains.

- Cascading production chains may **cross 'borders' between traditional sectors like materials, agriculture, fisheries and energy.**
- Producers within a cascading production chain share a focus on reduction of greenhouse gasses, optimizing value of all parts of the biomass, minimising waste and increasing efficiency.
- **It is question about synergic production network**

3. Market development measures needed both to create a market for sustainably produced biomass and for products from cascading chains.

There are several ways:

- (i) agreements that an increasing share of the market is sustainably produced or originates from a cascading production chain (the RED method),
- (ii) bio-preferred procurement programmes,
- (iii) setting targets for use of biomass in material and chemical sectors, or
- (iv) financial incentives.
- (v) Market development will make the business case possible in Sustainable Biomass Regions and within Cascading Production Chains.

4. Ensure that the right conditions are in place – the EU has an important role to play.



- Develop a common language or a preferential method to **measure greenhouse gasses within chains** and develop a method that expresses sustainability of biomass production and processing and of land use.
- Engage in bilateral **agreements that lead to development of Sustainable Biomass Regions** elsewhere in the world. Biomass should be (preferentially) imported from Sustainable Biomass Regions or from countries that commit to their principles.
- **Remove barriers. In EU legislation:** competition policies, public procurement, waste legislation, renewable energy directive and other legislation.
- Continue to **engage in technology development.**
- **Show commitment to the bioeconomy**, and its sources in forestry, agriculture and in marine environments.

Tell the story of new sustainable production and use, the new jobs and opportunities.

Key questions:

- How we build up **synergy between extensive and intensive use of land areas**
- How to build up **synergy between different business models** and visions
- How we build up **synergy between production or service systems with different boundaries**, some of them more restricted locally some of the more global

Techniques

- Value added knowledge is being built by interaction
- Informal ><formal knowledge
- Confrontation of ideas and knowledge internally and externally
- Connectiveness critical
- Balancing between cooperation and competition
- The formation of clusters of bio-based industries is an effective way to foster innovation in bioeconomy and, ultimately, to enable EU products to reach markets.
- Smart Specialisation concept to establish cross-regional sustainable value chains and to adapt regional pillars of competitiveness to future demands.

Wicked problem

- *difficult to clearly define.*
- *have many **interdependencies** and are often multi-causal.*
- *attempts to address wicked problems often lead to **unforeseen consequences**.*
- *are often **not stable**.*
- *usually have **no clear solution**.*
- *are **socially complex**.*
- *hardly ever sit conveniently within the responsibility of any one organisation.*
- *involve **changing behaviour**.*
- *Some wicked problems are characterised by chronic policy failure.*

- **Governance Capabilities for Dealing Wisely With Wicked Problems.**
Catrien J. A. M. Termeer, Art Dewulf¹ Gerard Breeman, and Sabina J. Stiller **next page**

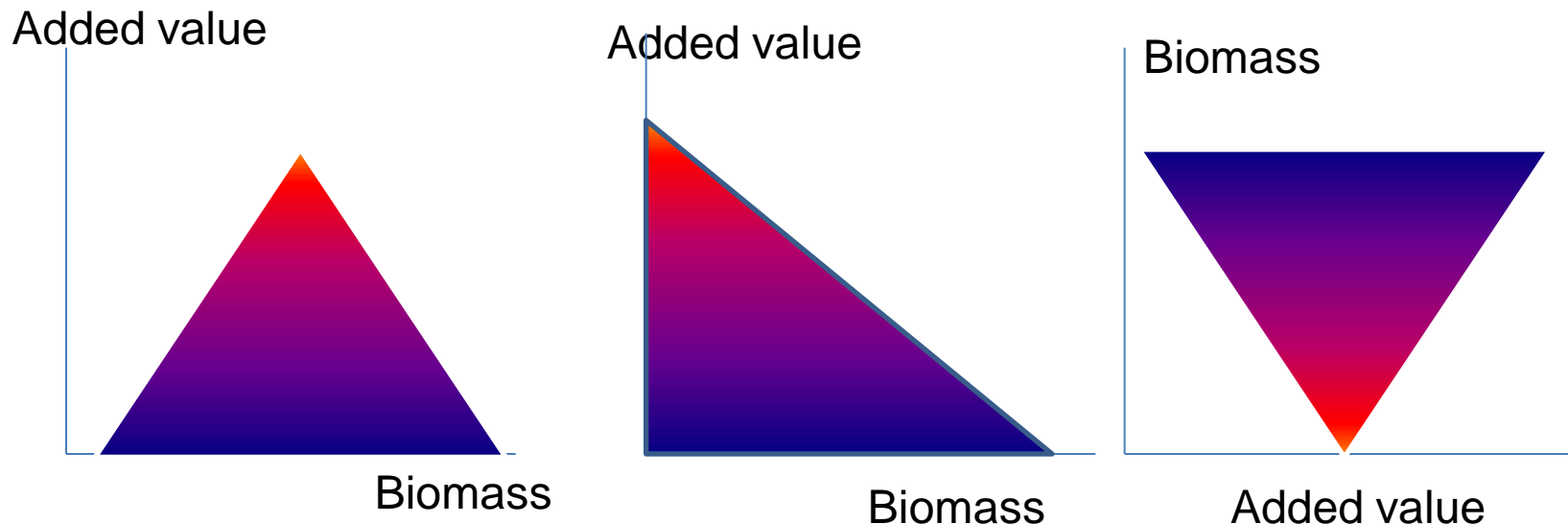
Table 2. Observations, Actions, and Enabling Conditions for the Four Governance Capabilities

Governance capability	Observing: Key observations	Action: Main strategies	Enabling: Cultures and arrangements
Reflexivity	One's own and other people's frames Processes of framing and its effects	Seducing people into frames Connecting frames Negotiating despite frame differences	Tolerance of ambiguity Embedding reflexive activities Process skills
Resilience	Weak signals Varied observations Threshold and cascading effects	Learning by doing Simulating and experimenting Taking robust or flexible measures Linking developments across scales	Tolerance of uncertainties Bridging arrangements Flexible institutions Redundancy Improvisation skills
Responsiveness	Media attention Different venues Focusing events Stories behind dramas and hypes Windows of opportunity	Deciding when to dive under the wave and when to react Communicating sensitively	Tolerance of information overload Be present where the attention is Parallel structures Political-sensitivity skills
Revitalizing	Symptoms Interlocking interaction patterns System archetypes Third eyes	Animating people Interventions to unblock stagnation Addressing dysfunctional interactions Counterintuitive intervention	Tolerance of disappointments Readiness to introduce third actors and contents Postponement of judgments Intervention skills

Source: Compilation by the authors.

Cascading – excellent idea or risky?

- Critical issue in terms how to apply among stakeholders
- Environmental sustainability is highly governed by raw material production
- Economic sustainability is governed by synergy and value addition
- Social sustainability is reflection by the previous





Thank you so much!

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