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Perception of and adaptation to climate change-induced forest dieback in mountain areas of Europe and China

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Research Background

Mountain forests represent close to 25% of the global forest cover. They play key roles e.g. in the preservation of biodiversity, and in natural hazard prevention. However, climate change is driving rapid transformation of mountain forests worldwide. Indeed, over the past two decades, **extensive tree mortality** caused by a **combination of stressors** like high **temperatures, dry conditions** and **insect and pathogen outbreaks** has been documented. Climate change scenarios predict continued rising temperatures and an increase in the intensity and frequency of climate extremes. Therefore, forest diebacks are expected to become more widespread, frequent and severe. Consequently, the related presence of large numbers of **deadwood** and a **change in tree species composition** will have an impact on **various forest stakeholders** and may lead to local social conflicts and/or economic loss.

Forest dieback in the Bavarian Forest National Park

The survey reveals **a forest owner typology** (proactive, reactive and insecure actors) and their preferred **adaptation strategies** (Figure 1). In general, forest stakeholders in Europe and China choose their adaptation strategies based on the following criteria:

- Size of forest stand (small: <20 ha, medium: >20 ha, large: >100 ha),
- Stand conditions like height, water regime, exposition, tree species (monoculture or uneven-aged forests) and forest damages (pest and disease etc.),
- Aims of forest management,
- Experiences (past events like extreme weather events) and knowledge (forest education, access to information, network),
- Time and financial budget.

Qualitative Study

This survey aims to understand **in-depth** and from a **sociological perspective** how mountain forest stakeholders (92 qualitative interviews) like forest owners and managers perceive and face up with **forest dieback** and **deadwood accumulation** in France (Pays de Sault), Germany (Bavarian Forest) and China (Yunnan). In this respect a **constructivist approach** was applied to understand if and why different forest actors change their daily practices and how they take into account new facts and systems of belief when the "normal" (biophysic and socio-economic) conditions are changing influenced by phenomena such as forest dieback and climate change.

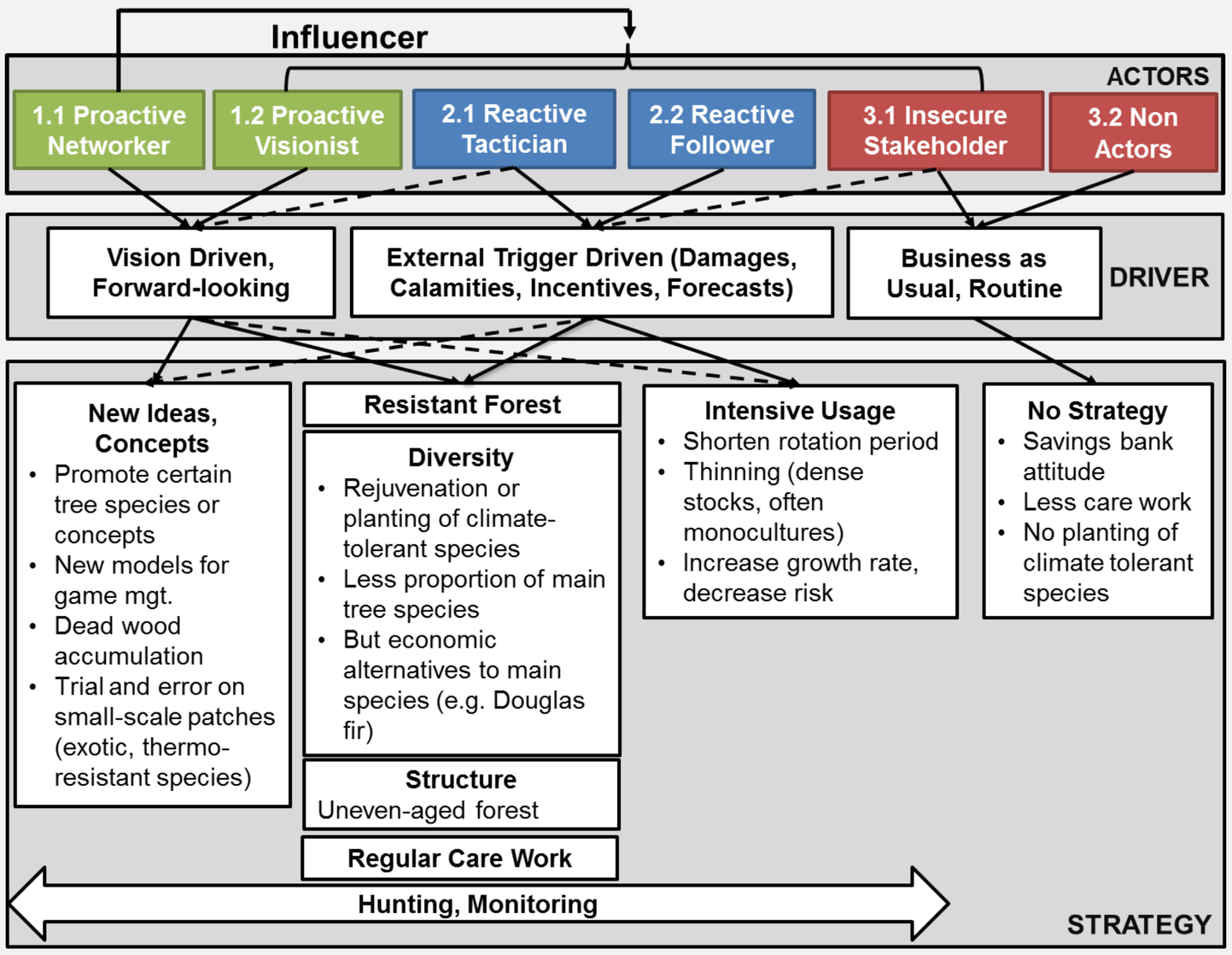

Figure 1: Forest owner typologies and adaptive strategies

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DFG Deutsche Forschungsgemeinschaft