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Defining a free market: drivers of unsustainability as illustrated with an example of shrimp farming in the mangrove forest in South East Asia

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ABSTRACT

We apply causal loop diagrams (CLD) to picture how complex societal scenarios can be understood in terms of interdependent drivers and mechanisms between actors from the public and private sectors respectively. And we show how un-sustainable scenarios can be understood in terms of insufficient balancing feed-back in the system. We apply the methodology to picture such imbalances as fundamental drivers behind the tragedy of the commons. And we apply it to go deeper into a specific business example in this context, a complex case of resource exploitation in Far East Asia. The CLD analyses inform a discussion on the interplay between societies on the one hand, represented by the Government and its legislature, and the private sector with its companies, consumers and market on the other. Our study confirms that unsustainability can only be understood and addressed at the systemic level, encompassing both natural and social systems, where also the virtual and emergent systems of modern civilization are considered. The results show that a market economy can only be sustainable as well as really free, when embedded in a systemic and balanced interplay between the actors on the arena. The provision of the market arena with well thought-through rules of the game, offered by a well-functioning democratic society, is needed. The challenge for leaders in business and society is to be able to grasp the causalities of the whole system, and let this guide and shape sustainable goals as well as leadership and management in coherence with such goals.

1. Introduction

Malthus (1798) was one of the first to worry about limits to growth and sustainability, and tried to define social and economic criteria for sustainability. He postulated that population growth would, one day, be able to outrun the resource capacity of a finite Earth. However, then the world was still very large with respect to population, and most people did not feel the urgency. During the industrial revolution that followed, the industrial potency increased fast enough to offset any scarcity, and no problems of limits to growth were seen as imminent. It was argued that Malthus was wrong because he did not foresee the rise of advanced technology, the oil age and he did not know the amount of resources actually available. The planetary limits issue was brought to the attention by the Club of Rome through their commissioned report "Limits to Growth", a study meant to stimulate precautionary thinking through studying the interaction between rising population and limited resources (Forrester, 1971; Meadows et al., 1972, 1992, 2005). The reaction from economists and policy makers at the time was vicious and argumentation was more emotional and loud than scientific and thoughtful (Slesser, 1972; Hayek, 1974, 1989; Haas, 2002; Nørgård et al., 2010; Kanninen, 2013); see also Williams and Matheny (1995) and Turner (2008, 2012) for further analyses. As it turns out, Malthus did not have the right numbers, but he was right that exponential growth would eventually outgrow any finite resource. Meadows et al. (1972) did a similar but now systems based study, and added empirically collected numbers to a numerical simulation (Turner, 2008, 2012).

The Brundtland Commission, assigned by the General Assembly of the United Nations in 1983 to create a "global agenda for change", put sustainability into the political focus in the landmark report

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"Our Common Future" (World Commission on Environment and Development, 1987). Following the UN summit on Sustainable development in 1992, countries around the world set Local Agendas 21 in line with the Brundtland report's key message: "Humanity has the ability to make development sustainable – to ensure that it meets the needs of the present without compromising the ability of future generations to meet their own needs." This statement is at the heart of sustainability thinking, and calls for a discussion on how humans can achieve this goal. To avoid unfruitful dogmatism, it is important that the rules of sustainability are applied in a realistic mode, in order. The demands for natural and economic sustainability must be socially sustainable in order to have any practical significance for human society (Gilman, 1990; van Pelt et al., 1995; O'Riordan, 1988; Drengson and Taylor, 1997; Dryzek and Schlossberg, 1998; Eckersley, 1992; Ponting, 1993; Bossel, 1998). Technical or economic sustainability alone may deteriorate to conditions that may resemble tyranny in all aspects (Klein, 2001; Diamond, 1997, 2005; Dryzek 2000, Costanza et al., 1992, Kennedy, 1987; Eckersley, 1992; Fukuyama, 2006, 2011, 2014).

2. Scope, methods and intent

The method used in this study is systems analysis as defined by Senge (1990, 1994), Senge et al. (2008), Sterman (2000), Haraldsson and Sverdrup (2004) and Haraldsson et al. (2008). The scope of this study is to investigate commercial activities that are recognized as unsustainable, explore the interdependencies of essential aspects to picture key drivers behind the unsustainable activities, and thereby identify opportunities to transform them to become sustainable. The scope is to see the commercial activities in context of society at large with its policy making.

The first part of the study is a review of overall aspects around the tragedy of the commons, demonstrating many examples of deficiencies in policies and regulations.

The second part goes more in detail by use of an example, shrimp farming in South East Asia.

Our systems perspective focuses the qualitative causal levels and leave numerical simulation-models outside the scope of the study. We will show how the state, businesses and customers, respectively, have important roles to play to make a sustainable system. The problem is analysed using causal loop diagrams (CLDs). And we discuss how such can be set into a generic framework for evaluating sustainability and backcasting from goals of sustainability (Holmberg et al., 1996; Holmberg and Robért, 2000; Robert et al., 2013). As regards the challenges for governance to connect the social world with that of nature, we use the analyses of Tilly (2003, 2006, 2007), Fukuyama (2006, 2011, 2014) and Rothstein et al. (2003, 2004, 2008; Rothstein and Stolle, 2003, 2004).

The CLDs are investigated pair-wise, by asking "if parameter A is changed, is there (a) any causal connection (an arrow) to B? And if so, does B respond to an increase in A with an increase (+) or a decrease (−)?" (Senge, 1990; Sterman, 2000; Haraldson and Sverdrup, 2004).

3. Tragedy of the commons

3.1. Visualization by use of causal loop diagrams

A CLD illustrating the tragedy of the commons is shown in Fig. 1. Many problems with resource management arise in modern society from this kind of system, where the responsibility for the resource is detached from the benefits, or belongs to unconnected agents. Kahn (1966), Hardin (1968, 1998), Odum (1982), Ostrom (1990, 1992), Ostrom et al. (1993, 1994), Perman et al. (1996), Dörner (1996) and Haraldsson et al. (2008) discuss several approaches

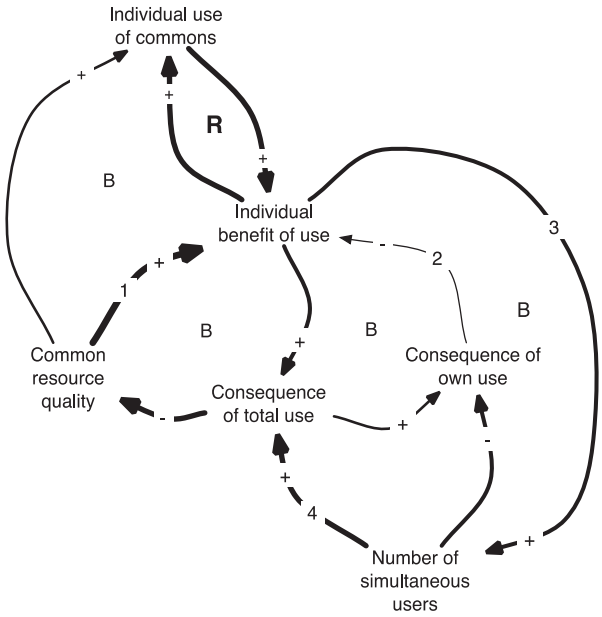

Fig. 1. Causal loop diagram for the phenomenon referred to as the "tragedy of the commons." Many modern problems arise from this kind of system, where a resource is overused to the degree where the resource may be destroyed. This happens when the responsibility for the common resource is decoupled from the benefits or belong to unconnected agents. The system has one reinforcing loop (R) and several balancing loops (B). The single reinforcing loop (R) is driven by the profit of using the common resource and represents the strongest force in the system.

for dealing with the problem and prevent destruction of the resource. A set of factors are involved in more sustainable use of resources. Increased transparency is important to avoid the tyranny of small steps and limits-creep (Kahn, 1966; Haraldsson et al., 2008).

Participation in consensus-based adaptive management is another method where the situation is monitored and managed, as well as distribution of benefits and obligations follow the general principles of rule of law as agreed upon.

Such balancing possibilities are illustrated in Fig. 2, which shows a modification of the CLD in Fig. 1. The mitigation is to limit the benefit through regulation or taxation, limit access to the resource, or strengthen the responsibility through regulation, taxation or social means like councils, participatory or consultative approaches (Odum, 1982; Ostrom, 1990, 1992; Ostrom et al., 1993, 1994; Norgaard and Horworth, 1991; Ainsworth and Sumaila, 2003; Lövin, 2007).

3.2. Current work within the EU

In their reports "A handbook for impact assessment in the Commission" and "A sustainable Europe for a better world, A European Union strategy for sustainable development", the EU Commission documents thoughts on future policies for sustainability. The documents are steadily updated and are downloadable from their website (EU sustainability policies 2008, 2014). Several threats to sustainability are mentioned from the EU perspective:

1. Global warming caused by human activity;
2. Threats to public health from antibiotic resistant microorganisms, hazardous chemicals and inadequate food safety;
3. Poverty and associated inequality;
4. Demographic shift towards fewer to work and more to support, emphasized by population increase in the older cohorts;

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