The impact and spin-off of participatory backcasting: From vision to niche

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ABSTRACT

This paper reports on a study that has systematically investigated the follow-up and spin-off of participatory backcasting experiments in the Netherlands five to ten years after completion. A methodological framework for participatory backcasting is presented, after which a conceptual framework is developed to describe and evaluate the impact of backcasting experiments. Three cases are analysed: (1) Novel Protein Foods and meat alternatives; (2) Sustainable Household Nutrition; and (3) Multiple Sustainable Land-use in rural areas. The cases show that participatory backcasting can lead to substantial follow-up and spin-off, but that is not always the case. Substantial follow-up and spin-off after five to ten years is predominantly found at the level of niches, and can be seen as potential seeds for future system innovations. The emergence of follow-up and spin-off comes along with the diffusion of the visions generated in the backcasting experiment. The visions provide orientation (where to go) and guidance (what to do). Visions also show both stability and flexibility. Factors that influence the extent of impact and spin-off of backcasting are identified, with a focus on stakeholders, learning and visions. Finally, relevance for system innovation theory, governance and policy as well as research recommendations are briefly discussed.

1. Introduction

In the last decade, the focus of researchers, policy-makers and many other actors involved in environmental and sustainability issues has shifted strongly towards system innovations and socio-technical transitions [1–6]. System innovations and socio-technical transitions are needed in order to achieve large environmental improvements and to deal with sustainability problems at a societal level, including mitigating and adapting to climate change. Addressing complex sustainability problems by system innovations and transitions requires participatory integrated approaches like transition management [2,4,6] and participatory backcasting [3,7,8]. Such approaches not only have a long-term future and system orientation, but also share a broad view of sustainability and take into account the dynamics of complex socio-technical change processes. The involvement of stakeholders is crucial: on the one hand their interests are affected, while on the other hand they possess essential knowledge and resources. Their involvement is also needed for endorsement and legitimacy.

Participatory backcasting has grown into an adequate approach to explore system innovations and transitions towards sustainability. It includes defining first steps and roadmaps or pathways towards an envisaged system innovation [3,7–9]. Backcasting literally means looking back from the future; it is a normative approach to foresight using desirable or alternative futures. It is very different from regular forecasting, which looks to the future from the present and is not normative, or only to a very limited extent[1].

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[1] However, backcasting can be related to what has been called normative forecasting [71,72] and normative forecasting is one of the roots of backcasting. How backcasting relates to forecasting has also been discussed by Robinson [73] and by Höjer and Mattsson [74].

According to Dreborg [10], backcasting is particularly useful in case of highly complex problems; when there is a need for major changes, when dominant trends and externalities are part of the problem and when the scope and time-horizon involved are broad enough to leave room for the development and implementation of very different alternatives. In the last decade, backcasting has received increasing attention and is applied more and more. For instance, Giddens [11]: p 98–100] has put forward backcasting as a tool for moving toward alternative futures when dealing with climate change, and as a sustainable alternative to traditional planning.

Since a few decades, sustainable futures have been explored in participatory backcasting experiments, especially in the Netherlands, Canada and Sweden, and recently in other countries as well. Numerous stakeholders have been involved and the first follow-up steps and implementation strategies have been planned in line with envisaged sustainable futures. But what are similarities and differences between backcasting experiments? And what is the impact of participatory backcasting experiments five or ten years later? Moreover, do the impact and spin-off actually contribute to system innovations towards sustainability in the longer term? Unfortunately, studies evaluating backcasting experiments after several years and systematically comparing them have not or hardly been conducted so far. But if backcasting experiments could eventually lead to system innovations, or at least offer a significant contribution, we need to know more about the effects after five to ten years, as well as about the underlying mechanisms and dynamics.

Despite the lack of comparative studies on backcasting, it has been shown that there are considerable differences with regard to the way backcasting experiments have been conducted. In addition, the degree to which particular backcasting experiments have led to follow-up and spin-off after a few years considerably varies too [3,7]. There are some evaluations of backcasting experiments available, but they are limited in the sense that they focus either (i) on the way the backcasting approach has been applied and the content results that have been achieved [8,9], or (ii) on the stakeholder learning process and the social dynamics among stakeholders during the backcasting experiment [12,13]. As a consequence, no conceptual and analytical frameworks for analysing the follow-up and spin-off of participatory backcasting after several years have been developed so far.

The issues discussed earlier give rise to several questions that are addressed in this paper. Firstly, what are the discernable effects of backcasting experiments after five to ten years and how can they be analysed? Secondly, what are differences and similarities across backcasting experiments, and can these be related to factors enabling or constraining the impact and spin-off of backcasting experiments after such a period? Thirdly, can the impact and spin-off of backcasting experiments be seen as a stepping stone towards system innovations, or could it make a significant contribution to them? To answer these questions, this paper reports on a study that has systematically investigated backcasting experiments in the Netherlands, as well as their follow-up, impact and spin-off seven to ten years after completion.

The paper is organised as follows. In Section 2, we briefly summarise major developments in backcasting, in particular in the Netherlands, and we present an overarching methodological framework for participatory backcasting that cover most of the diversity in participatory backcasting. In Section 3, we develop a conceptual framework that includes both the backcasting experiment and its impact after five to ten years. In Sections 4 and 5, we describe and analyse three case studies from the Netherlands; (1) Novel Protein Foods and meat alternatives (NPF), (2) Sustainable Households and Nutrition (SHN), and (3) Multiple Sustainable Land-use in rural areas (MSL). In Section 4, we evaluate and compare the backcasting experiments, whereas in Section 5 we analyse their impact and spin-off before discussing factors that may have enabled or constrained the extent of spin-off and follow-up. In Section 6 we present our conclusions. Finally, in Section 7 we relate the results to (system) innovation theory and we also discuss relevance for governance, transition monitoring and some research recommendations.

2. Participatory backcasting: from diversity to an overall framework

Backcasting was first applied in the 1970s in energy studies [14,15]. The focus was on developing and comparing the feasibility of alternative energy futures. Later, backcasting was also applied to sustainability problems [10,16] and for moving organisations towards sustainability [17]. Since the early 1990s it has developed into a participatory approach, especially in the Netherlands [7,8,18,19], Canada [20,21] and Sweden [10,17,22,23]. A more detailed overview of the developments in backcasting is given elsewhere [3,7].

Focusing on the Netherlands, participatory backcasting was, for instance, applied at the Sustainable Technology Development Programme [8,18]; as part of the EU-funded 'Strategies towards the Sustainable Household (SusHouse)' project [24–26]; and within several stakeholder dialogues, like the COOL (Climate Options On the Long-term) dialogue [13], the hydrogen dialogue [27] and the biomass dialogue [28]. In addition, participatory backcasting has been applied to sustainable industrial paint chains [29], livestock breeding [30], horticultural research [31], academic education [32] and as part of various international projects on local and regional land-use futures [33–35].

A literature overview has shown that there is a considerable variety in backcasting methodologies [3,7,32]. For instance, there are differences in whether and how stakeholder participation has been organised, in the number of steps in which the methodology has been split, the methods that are used, the kinds of topics being addressed, the nature and scale of the systems addressed (e.g. local, regional, national, consumption systems, or societal domains), the number of visions developed and how the visions have been developed, and if the focus is on learning and raising awareness among stakeholders, or on realising follow-up and implementation. In addition, the term backcasting can refer to a conceptual approach or to a more operational methodology, though it is also possible that it only refers to the step in which the backwards-looking analysis is conducted. Furthermore, other approaches like transition management, roadmapping and several others also use normative future visions and pathways how to get there, sometimes without explicitly referring to the term backcasting, which makes the variety even larger.