forests

MDPI

Article

Nudging in the Forests—the Role and Effectiveness of NEPIs in Government Forest Initiatives of Bavaria

Peter K. Aurenhammer

Technical University of Munich and Bavarian State Institute of Forestry; 85354 Freising, Germany; peter.aurenhammer@prosilva.at

Received: 30 November 2019; Accepted: 28 January 2020; Published: 1 February 2020

Abstract: This paper analyzes the use of new environmental policy instruments (NEPIs) and instrument mixes in government forest initiatives (GFIs), in Bavaria. It traces research questions on the repertoire of instruments applied and if an application of NEPIs leads to improving program effectiveness and legitimacy. In accordance with recent literature it assumes that GFIs, being developed and implemented for a long time in Bavaria, will make use of an instrument mix, including modern policy instruments; and that the use of such a mix of instruments would lead to improved effectiveness and legitimacy. The empirical paper aims to test these currently dominant theoretical thoughts and to contribute to further theoretical discussion with new empirical data, but it does not suggest a new theory. The primary data-basis for the analysis is qualitative interviews with 175 people from 16 GFIs, the selection of interviewees being based on social network analysis. The analysis uses an instrument typology as an analytical reference point and reveals that GFIs used a broad variety of instruments, both, traditional and new ones, to support and facilitate a range of activities in priority areas of forest landscapes, as expected. Some traditional instruments were modified for the use in GFIs only, other instruments were newly created for the purpose of GFIs, e.g., voluntary agreements between government forest administrations (AELFs) and private forest owners (PFOs). This supports assumptions from the theory that the most common forms of instrument integration would be layering and fusion. The paper also analyzes if the use of a mix of instruments by GFIs led to improving effectiveness and legitimacy, thereby contributing to a relevant question in the literature, because developing more complex policy instruments (NEPIs), is considered to help to avoid many problems of more traditional instruments in environmental governance. The analysis uses a set of theoretical elements, attributed to the use of NEPIs or modern instrument mixes, and compares these with actual empirical observations, to answer the question, if modern instrument approaches can lead to an improved program effectiveness and legitimacy. The paper concludes that the application of a modern mix of instruments did lead to an increase of short-term effectiveness, especially in road construction or improvement, but not to a noteworthy increase of long-term effectiveness, especially regarding forest conversion to increase forests' climate resiliency, despite the application of nudging 'in the forests'. Instead, nudging in the forests can result in increased conflicts and non-action, in some cases. Hence, the empirical evidence presented in this paper, does not (fully) support the assumption that a modern instrument mix would lead to improvements in effectiveness and legitimacy. It remains to be seen, if, in the longer-term, the improved road access would actually lead to more climate resilient forests; or what role natural hazards will play in this regard. Maybe, a more flexible design of the voluntary agreements and of eligibility criteria of funding schemes, could increase the share of forest owners, willing to participate and could enable processes of civic-knowledge integration and the development of more innovative, alterative-based, local solutions. Considering the strong, recent public engagement in climate change topics, this could be an opportunity to better integrate civil society to GFIs or to new forms of initiatives. A better integration of owners and society could also improve the legitimacy of GFIs, which is thwarted by the marginal participation of individual PFOs.

Keywords: forest initiatives; NEPIs; forest land use; conflicts; wood mobilization; climate resilience

1. Introduction

Bavaria has a long tradition in developing and implementing government forest initiatives (GFIs). These initiatives, further described below, focus on areas with small-scale private forest ownership patterns in, often, mountainous landscapes. Additionally, GFIs may take advantage of private forest owner associations, developed for many decades in Bavaria [1]. Given the long history of developing and implementing such various initiatives in this region, research is provided with an exceptionally large number of potentially interesting cases, developed under diverse circumstances, and it is most likely that, after such a long period of time, one could find a large diversity of political instruments that have been applied, tested, fine-tuned or adapted, mixed or newly developed, for the implementation of GFIs.

Therefore, the selection of Bavaria, as a case study region, seems to be very appropriate for the analysis of new environmental policy instrument use, application and advantages, in GFIs. Nevertheless, the results of this analysis are limited to GFIs and to Bavaria in a strict sense, but can most likely be generalized and provide interesting insights to research and practice, for similar regions, with respect to small-scale private forest ownership patterns and mountain landscapes.

Given the likeliness of finding a diverse mix of political instruments, being used in Bavarian GFIs, the analysis in this paper can contribute with empiric evidence to existing (gaps in the) literature and to the recent theoretical discussions or assumptions, i.e., on the instrument repertoires used in environmental policy; on whether and in what ways mixes of traditional and new instruments occur and if such mixes actually lead to improved effectiveness and legitimacy, thereby overcoming disadvantages of traditional instruments (see below).

Consequently, this paper uses and describes an existing analytical typology of instruments after von Prittwitz [2], as a reference point for its analysis of instrument repertoires, and it identifies key theoretical elements, literature considers as the advantages of modern policy instruments over more traditional ones (see below), in order to provide for and structure empirical results accordingly and evaluate the occurrence of advantages in practice.

In accordance with recent literature (see below), it is expected that a diversity of instruments can be found from Bavarian GFIs and that a mix of traditional and new instruments is applied. It is further assumed that such a more modern mix of instruments has led to advantages over more traditional forms of governing, such as in effectiveness and legitimacy.

The empirical paper aims to test these currently dominant theoretical thoughts and to contribute to further theoretical discussion with new empirical data, but it does not suggest a new theory.

The key research questions, traced in this paper, are:

(1.) What repertoire of instruments GFIs apply?
(2.) Do they apply a mix of traditional and new instruments (NEPIs)?
(3.) If so, does such a mix of instruments lead to improving effectiveness and legitimacy?

As can be seen from the above, the focus of this paper's analysis is on the application of policy instruments, the mixes of traditional and more modern ones and the expected advantages of more modern forms of instruments, in terms of effectiveness and legitimacy. However, more generally, policy analysis needs to look also on the feasibility and acceptability of political programs, e.g., on the actors, their influence, capacities and willingness to reach certain goals within a policy field or initiative; which in turn provides the basis for the selection and support of various policy instruments as well as for their implementation (e.g., provision of financial resources). Effectiveness and legitimacy may hence not always be the most prominent factors, when it comes to policy instrument selection.

While I am focusing this paper on the above mentioned analysis of instrument application, the factors acceptability and feasibility are well considered already in the underlying actor analyses of GFIs (not in the detail part of this paper), where social network analysis was used to identify the most

important, influential actors and their priority goals. The influential actors' priority goals or activity areas, identified for GFIs (see Table 1), can be expected to gain strong support and their fulfillment can be expected to be even more likely, the more the support of activities bases on a mix of policy instruments. However, conflicts with less influential actors, e.g., on competing land-use interests, with individual private forest owners or the public, could lead to throwbacks in the implementation of goals.

Table 1. Comparing goal priority, conflicts, applied instruments and implementation success, across GFI goals.

Goals (activity areas)	Priority	Conflicts	Instruments	Implementation
Sust. protective functions, forest conversion	+++	**	O, A, F, SP, N , vC	(+)
Hunting, alpine pasturing	++	***	AR, SP, eA, vC	+/-
Society, recreation	++	*	PR, VG, FP	+
Wood harvests, marketing, road construction	++	(*)	O, A, F, (SP), vC	+ +++
Advisory & organisation of private forest owners	+	(*) who–whom?	P/JM/RT, PR	(+)
Nature/water protection	+	0	Bio / F	+
Markets for NWFPs	0	/	/	/
Regional developm., SMEs	0	/	/	/

Legend: O—Organization; A—Advisory services; F—Funding (subsidies); SP—Social pressure; N—Nudging; vC—voluntary Contract; AR—Awareness-Raising; eA—external Advisory; PR—Public Relations; VG—Visitor Guidance; FP—Forest Pedagogy; P—Participation; JM—Joint Measures; RT—Round Table; Bio—Biotope management. *: (intensity of) conflicts related to a goal or activity area. Brackets: interlink conflicting goals (the thicker, the higher is conflict relevancy). Goal priority or implementation success: very high +++, high ++, low +, marginal (+), none/very low 0; low or counterproductive implementation +/-. No data or not applicable: /.

However, first, before getting deeper into the analysis, the reader will find some more explanation in this introduction, e.g., on the definition and types of political instruments, the assumptions of recent literature, regarding the role of new policy instruments or instrument mixes, which are the bases of this paper's theoretical assumptions and expectations. Further insights to the cases, the GFIs in Bavaria, are also given.

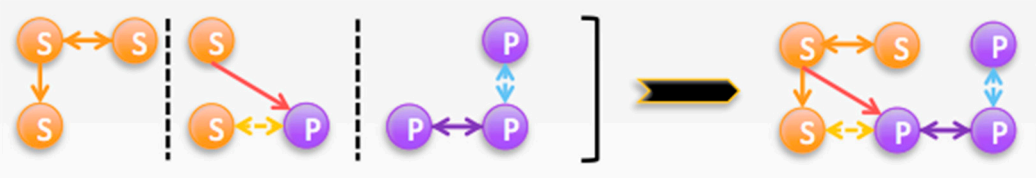
1.1. Political Instruments

Political instruments can be defined as regulating mechanisms that influence the activities of actors [3]. Generally, one can distinguish informational, legal, economic or financial and planning instruments [3].

Another form of definition or distinction into different types of political instruments relates to the kind of regulating relationship [4,5]. Following this approach, we can distinguish regulation between government actors (political-administrative instruments), between private actors (social instruments) and between governmental on one side and private actors on the other side (regulative instruments) as well as between vertical or horizontal regulation [4,5] (Figure 1).

There exists a great diversity of potential instrument combinations [4,6], but despite this diversity, all instruments have in common that they are based on information and power [3] and on actor willingness to apply, use or provide these capacities to reach anticipated change [1,7–9]. This relates also to the above, i.e., that next to effectiveness, efficiency and legitimacy, also political feasibility or acceptability can be especially important for policy analysis. Information and power can be understood also more broadly as actor capacities, i.e., general or forest related information, financial or material resources, staff or time resources, trust, formal or informal competencies (legal or social norms) and the overall influence an actor can gain with these capacities [1,7–9]. A helpful overview on the variety of instruments, from more coercion-based to more incentive and alternatives based instruments, is given

below, as an analytical reference point for further analysis, after [2] (Figure 2). It will be used to structure our empirical data for the analysis of the instrument repertoire used in GFIs.



Legend: orange/S = State, government actors; violet/P = private actors

Figure 1. Regulating relationships—a diversity of options and combinations.

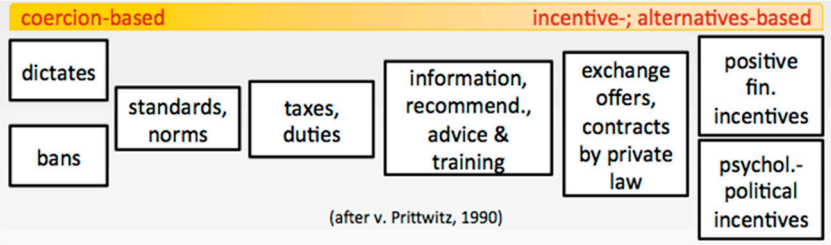


Figure 2. An instrument typology, as an analytical reference point.

Instruments work by simplifying reality [4], but especially in environmental, climate or forest policies or problems, actors face great complexity, uncertainty or ambiguity, which can increase the potential for conflicts, usually related to: assessing the status quo, choice of appropriate instruments and their short- or long-term effects as well as agreeing on the most important or appropriate goals [10].

After reaching a goal partly or not at all, a new initial situation arises. So, we usually face partial solutions to complex problems and a broad variety of problem shifts [2]. The appropriateness or effectiveness of policy instruments can therefore also be assessed, looking at the abundance of (unintended) problem shifts, the creation of new conflicts due to interest spirals and by looking at the effect amplitude and profundity of instrument application [2,7].

The application of instruments in complex environmental fields faces further problems, well known as the prisoner's dilemma, free rider effects and the tragedy of the commons. Free-riding effects include the payment of subsidies for activities that would have been implemented anyway [4,6].

The difficulties in the environmental field, including forest land use, have been summarized by scholars as 'persistent environmental problems' [11]. Such problems are considered persistent, due to the (a) functional interdependence of natural subsystems and policy areas, (b) the spatial interdependence, including transnational externalities, tragedies of the commons, upstream-downstream, multiple levels with a lack of policy coordination, institutional misfit, more heterogeneity of interests and more veto-players, (c) the high degree of complexity, which makes it difficult to understand the causal linkages between factors and effects, especially spatial distances and time delays between the causes and effects and tipping points, (d) the high level of uncertainty (precautionary principle) and (e) the large amounts of ambiguity, meaning the variability of legitimate interpretations, based on identical observations or data [11]. Since political programs, i.e., policies, usually contain fact and value arguments [6] to legitimate and support the choice and use of certain instruments or goals, the more the facts on a specific issue can be legitimately interpreted differently, the more likely is the value based argumentation, denial or inaction. A similar reaction is possible, however, also if facts are very clear to all (strong problem pressure and willingness), but actors lack capacities, hence the appropriate instruments to tackle a problem, which was called the Catastrophe Paradox [2].

1.2. Advantages of New Environmental Policy Instruments (NEPIs)

By developing more complex policy instruments, i.e., 'New Environmental Policy Instruments' (NEPIs), these are expected to help to avoid the tragedy of the commons, external effects, to save collective goods, to solve prisoner dilemmas and prevent the free rider problem [4].

The choice and use of instruments depends on several factors. In accordance to above, two important factors are the availability of actor capacities and of actor willingness to provide, share and receive capacities offered or transferred through instruments, e.g., information, subsidies or voluntary agreements [2,6–10,12]. Linked to the before are historical-institutional preconditions or pragmatic experiences of actors [4,13–15]. A critical question is whether and to what extent actors perceive a need for action, i.e., the actual political or social problem definition, which can be measured, e.g., by actual disbursements to a problem area or by owner behavior change in the management of forests, but which often does not correspond to (observed) problem pressure, i.e., a scientifically measured value, e.g., the rate of deforestation, forest calamities or forest fires [2,7]. The choice and use of instruments depends further on contexts, such as symbolic policy, clientelism, corporatism or on the power of a sector within multi-sector conflicts. Regarding the latter, scholars identified a 'weak forest sector' [16].

Further, we can distinguish 'simple' from more complex problems or conditions of instrument use. Among the more simple ones are subsidies for afforestation to increase forest areas or subsidies for road construction to improve the forest road network. Again more complex ones include 'instrument-packages' to promote forest conversion, i.e., silvicultural and hunting measures to increase the share of broad-leaved trees, to improve the climate resiliency of forests. Another example is the promotion of silvicultural and harvesting measures to improve and sustain the provision of forest functions.

Once instruments are chosen and 'institutionalized', a change in the instruments is very difficult to realize and is prone to conflicts [4,15].

More recently, in environmental and related fields of policy and governance research, a change in policy instrument repertoires is discussed, towards more complex uses of traditional and new policy instruments. In the concept of 'governing' [13], a more holistic approach is taken, considering the tools, instruments, processes and forms of traditional (government) and of 'new' socio-political control mechanisms (governance). However, it is intensively discussed, how the more traditional and the new instruments may work together or if the new ones will eliminate the use of the traditional ones: co-existence, fusion, competition or displacement? [13,17]. Many scholars opt today for some kind of 'a new instrument mix' [13], either a fusion [13,17] or a layering [18] of old and new instruments, is considered most likely. According to some, hybrids will be created [13,19]. Again, others discuss about a drift towards new instruments, a conversion or about the exhaustion of traditional instruments, being inappropriate to solve today's problems [18].

Layering is seen as a process, where new elements are 'grafted' on top of existing policy instrument repertoires, in order to create a new instrument mix [13,18]. Hybrid instruments are defined by their 'governance-cum-government' typology (characteristics), i.e., who determines goals, who selects policy tools—government or societal actors [19] (p. 226). To the latter, one could add, who determines the problem, as a further factor in the typology. The analysis of GFIs, in this paper, will also provide empirical insights to the way traditional and new policy instruments are combined in practice, contributing to the current theoretical discussion.

Advantages of NEPIs are seen in increased actor participation, coordination and knowledge integration, which again would lead to more effectiveness and, maybe, also to more legitimacy of environmental policy [11,20,21]. NEPIs would achieve this, especially through more participation of non-government actors in decision-making processes (DCM), a better horizontal (across sectors) and vertical (across territorial levels) coordination and a more effective integration of scientific and civic knowledge or expertise in the DCM [11]. Traditional forms of government regulation have two shortcomings, which are interdependent: a lack of effectiveness and a lack of legitimacy, however, governance per se is no guarantee for more effectiveness and legitimacy [11]. Above theoretical elements,

i.e., advantages of NEPIs, are considered in the below analysis of whether or not modern instrument mixes in GFIs lead to improved effectiveness and legitimacy, and provide the framework for the descriptive analysis of empirical data. This analysis, hence, contributes to existing scientific discussions on the advantages of NEPIs, by verifying the above theoretical assumptions with empirical data.

Two forms or concepts of modern policy instrument mixes are 'nodality' [22,23] and 'nudging' [24]. In the NATO classification, the author focuses on the range of resources available to those who govern, not on different degrees of imposition: Nodality, Treasure, Authority and Organization [13] (p. 14) [24]. In below analysis, the occurrence and role of nudging 'in the forest', as a modern concept, is given consideration.

However, the state is considered to remain an important actor, also when applying modern policy instruments [6–11,13,25,26], when seeking cooperation in policy networks in the 'shadow of the law or the hierarchy' [27–29]. Reasons for this are plentiful: we may recall the maxim of Richelieu [30], the role of the state in corporatism or clientelism [3] and the state's institutional interest in sustaining or expanding of own resources and competencies [3,14]. Therefore the state will rather oppose any measures leading to the loss of its own power, but to an empowerment of others, at least in priority areas, but empowerment can also be considered a strategy of retaining power, given increasingly scarcer (human and financial) resources. In this regards, a paradox in current policies is, for instance, the need of a strong state for the institutional transformation towards a bio-economy, where policy analysis identified, both, elements of a neoliberal laissez-faire and of an interventionist state [10,25].

Traditional forms of hierarchical command-and-control intervention are still quite dominant and government actors still hold important roles in the institutionalization and in the direct influence of political processes [11]. Networks can contribute to the (self-)regulation 'in the shadow of the hierarchy or the laws' [13,27–29]. The rise of new modes of governance relies heavily on horizontal regulation or 'self-steering' instead of hierarchical top-down c-&-c regulation [31,32] although in order to be effective they normally need 'the shadow of hierarchy' in the form of a credible threat of government intervention [29]. It therefore can be expected that participation is linked always to existing power structures.

1.3. The case of Government Forest Initiatives (GFIs) of Bavaria

In this paper, I want to focus my analysis on the implementation of instrument mixes in modern, participatory forest initiatives in Bavaria. These initiatives are led and managed by project managers, affiliated with local, government forest administration, so are considered government forest initiatives (GFIs) as opposed to non-government forest initiatives [8,9], which are not considered in this paper.

After a political-administrative success of the Bavarian forest administration, it was possible to gain access to budget resources and establish, under the Climate Programs 2020 and 2050 of Bavaria, a program for establishing GFIs, with the overall, formal program goal of increasing the adaptation of forests to climate change (climate resiliency of forests). Additionally GFIs aim to support forest management, wood mobilization, forest conversion and the sustaining of the protective functions of forests [33].

The model approach foresees, for some types of GFIs, the establishment of a regional, district level political advisory council, i.e., a horizontal regulation between state and private actors, and at the local level the formation of GFIs in concrete forest landscape areas. About 150 of such GFIs were formed, developed and partly completed or terminated, between 2008 and 2015. Since 2008, 47 GFIs focused on mountain forests, with activities on more than 47,000 ha of forest land and an average government subsidy support of 43 euros per hectare [34], i.e., a vertical regulation between state and private actors.

The local forest administrations (AELFs) employ project managers who are responsible for the organization of participatory processes, their moderation and for the implementation of activities and subsidy schemes. The establishment of regular 'Round Table' meeting is suggested, to enhance and ensure the participation of a broad variety of government and private actors, including representatives of groups of individuals, i.e., a horizontal regulation between state and private actors [35,36]. However,

in most GFIs, such 'Round Tables' do not exist physically in reality, but, despite this, actor networks do exist, even beyond such 'physical structures' [37–39]. The main paradigm of change behind the program and its GFIs is that an increased counseling and collaborative action will lead to private forest owners that are more active and motivated in using and managing the multiple benefits of their forests [37].

The analysis of GFIs extended quantitatively to 44 initiatives, 16 of which were analyzed using qualitative, semi-structured interviews, but also field research to prove changes in the forest use and document analysis, for the triangulation of data obtained from other methods.

2. Methodology

The broader methodological background of the analysis of GFIs is described in [38,39] in great detail. The research applies the Actor-centered Analytical Approach (AAA) [7] and uses the Social Network Analysis (SNA) and semi-structured qualitative interviews as its main methods.

These methods used are very commonly applied in policy analysis and by using a broad set of methods, combining both quantitative and qualitative ones, the analysis benefits from the individual strengths of each method and it can base triangulation on a multiplicity of empirical data. This is especially helpful, when answering complex questions, such as on the improvement of effectiveness or legitimacy, for which one needs also to understand acceptability or feasibility of program or initiative goals, e.g., gain information on who the influential or most important actors are, what priorities they have (e.g., in terms of forest land use), what conflicts arise, what instruments are chosen and what are missing from the repertoire and why. Applying a most-different approach (see below) adds also to the reliability of empirical data, as it allows to gain empirical insights to cases (GFIs) from a broad variety of circumstances. Similarities in factors or processes across such different cases are very strong empirical results, e.g., similarities in priority areas, in most influential actors involved, in arising conflicts or in the mix or way of instrument application.

2.1. SNA-Based Actor Identification

As a background, to better understand the analysis in this paper, I need to highlight some aspects. The identification of actors interviewed is based on the process of the quantitative SNA. The quantitative SNA questionnaire (Supplementary Material, SM 1) included three parts. For the analysis in this paper, I refer only to the first part of the questionnaire, which is used for the identification of the most important actors, i.e., quantitative decision networks using partial SNA (SM 1, Sheet 2 and 3).

The quantitative SNA was started by sending my questionnaire to the project manager or initiative leader. Starting from this initial or first actor, the network was expanded ('1st round') and each actor mentioned as being amongst the most important (see below) was interviewed (received the same questionnaire), as were newly mentioned actors in further rounds, until, ideally, no further new actors appeared. Due to certain limitations, e.g., the inability to reach a particular actor or the unwillingness of an actor to respond, a 'full' network cannot be achieved in reality (response rate: 68% of identified actors). All these questionnaires were either completed electronically by the respondents or in telephone or personal interviews, depending on local contexts and respondent preferences or support needs.

2.2. Qualitative, Semi-Structured Interviews

For the semi-structured actor interviews on GFIs (here: different types of Bavarian State Forest Administration Initiatives), a guideline was developed (Appendices A and B). It was used for the interviews, after adaptations that based on the experiences from role play testing in a peer-group and on such from an initial round of real interview situations. All of the initial interviews could be used (no exclusions), because changes were not substantial or better questions or ways of posing a question were learned and applied in the course of the role-play and initial interviews.

The guideline was used as a rough framework for the semi-structured interviews. Most interviews lasted around one hour, some were more extensive (two or more hours; partly including field visits). A set of issues/questions were aimed to be addressed as a minimum, but during the interview much emphasis was given to a flow of talk or story telling by the interviewee, kicked off by some initial questions.

So, the interview process, depended much on the 'eloquence or loquaciousness' of the interviewee as opposed to (initial) 'taciturnity' of an interviewee. In the former case, the interviewer was instructed to listen and rather guide the flow of discussion, in order to ensure responses to all the needed questions (relevant for the triangulation of data). In the latter case or in situations with more time-pressure, the interviewer was (at least initially) more 'proposing' questions and therefore discussion contexts and tried to or needed to increasingly pose guiding and open-ended questions or highlight the importance of the interviewee's opinion for a better understanding of the research area in question, also here with the aim of triangulation of quantitative data. The interviewer needed to quickly adapt to different types of actors, be flexible and emphatic, in order to reveal different actor's experiences.

From all interviews, comprehensive notes were taken. In taking notes, interviewers took care not to disturb the flow of talk of the interviewee. The interviews were later summarized, with a focus on the variables under consideration. A table (Appendices A and B) helped to check and summarize interview contents, already during the interview. Therefore, interviews were not recorded or fully transcripted.

The guideline for interviews consists of a general part, focusing on the formation and phases of the initiatives as well as on the specification of potential forest land-use changes and of goal perceptions and fulfillment, through largely open-ended questions. The guideline continues then with more initiative-specific questions. Such questions relate to special or unexpected roles of actors, to a further check of the interviewed actor's own point of view or to a discussion on the identified key goals and their fulfillment.

The interviews took place in generally very open and trustful settings. This was achieved sometimes only after another clear statement of institutional independence, of standardization and of non-forwarding of individual responses or data to anyone beyond the group of researchers, involved in the analysis, as well as of the restriction of IT-access to data, being limited to only the research group.

2.3. Theoretical Elements Used To Analyze Qualitative Data

The qualitative data received from the semi-structured interviews was very comprehensive, as it served several tasks, among others, to triangulate data from quantitative SNA [37–39]. So, to answer the above research questions, theoretical frameworks and analytical reference points were needed to assess data related and relevant to the research questions on policy instruments.

One such reference point was the instrument typology, adopted after Prittwitz [2] (see Figure 2, above). It was considered to serve well the need to categorize and structure the data on various instruments or uses of actor capacities in the GFIs.

Further, following the research questions, key theoretical elements were used to structure and analyze qualitative data, but also data from documents analyzed. Such elements were related mainly to theoretical assumptions or approaches discussing, how the more traditional and the new instruments may work together or if the new ones will eliminate the use of the traditional ones [13,17]. The concepts of 'fusion' [13,17] and 'layering' [18] of old and new instruments, were considered most interesting in this respect.

More importantly, theoretical elements for the analysis of qualitative data were extracted from the scientific discussion on the advantages of NEPIs, including: increased actor participation, coordination and knowledge integration, which again would lead to more effectiveness and, maybe, also to more legitimacy of environmental policy [11,20,21]. NEPIs would achieve this, especially through more participation of non-government actors in decision-making processes (DCM), a better horizontal (across sectors) and vertical (across territorial levels) coordination and a more effective integration of scientific and civic knowledge or expertise in the DCM [11,20,21].

Last, but not least, the concept of 'nudging' [24], raised the interest of this analysis, based on the empiric observations made in GFI analysis. This has then led also to a part of the title for this paper.

2.4. Materials and Methods, Data Basis

Quantitative questionnaires, using e-questionnaires or telephone or face-to-face interviews, and qualitative semi-structured interviews, using mainly face-to-face interviews, were conducted between 2014 and 2017.

For this analysis, the quantitative SNA is mainly relevant to understand the process of actor selection, in general. Quantitative SNA-based influence analysis included 37 individual GFIs or 252 persons. Quantitative SNA-sampling-based perception analyses included 44 cases or 271 persons. Where qualitative open-ended statements were possible in the response to this type questionnaire, these were also considered for this paper's analysis (if relevant to the questions under consideration).

The main data source, for the analysis in this paper, are, however, the qualitative semi-structured interviews, conducted, together with observations from field visits and data from the analysis of documents, received from these interviewees. Qualitative semi-structured interviews were implemented in 16 GFIs and covered responses from 175 people, i.e., actor representatives from local government forest administrations (22), nature conservation associations or areas (16), private forest owner associations (16), municipalities (15), hunters and hunting associations (9), wood-based industry (9), forest service companies (6), forestry research and wildlife experts (5), other/superior government administration (4), tourism or recreational associations (2), forestry related societies (1) and individual private forest owners (70).

A first selection of GFIs was necessary already for the quantitative analysis (44 out of 150), using a most-different approach [7] (pp. 30ff), [40] (pp. 198ff), [41] (p. 29, 71). For the identification of most-different initiatives or regions of initiatives, I included a more or less broad set of factors, among others, in the following:

(1) Forest ownership and subsidies: e.g., forest ownership of the state (%), mean size of private forest ownership (ha) or share of private forest owners owning less than 2 ha (in %), mean rate of forest or nature conservation subsidies for private forest land (euro/ha, year);
(2) Ecosystem and functions: e.g., coniferous vs. deciduous dominated forests, diversity of initiative goals, diversity of forest functions (e.g. % of forest areas without 'special' forest functions, other than wood production or the degree of multifunctionality, indicating forest function overlap or density identified in an area by forest or conservation planning);
(3) Generation change (e.g., % of private forest land owners older than 65 years);
(4) Population change (e.g., strongest decrease vs. strongest increase);
(5) Gender (% of female forest land owners).

All of the above factors were considered in the selection of initiatives for their initial quantitative analyses from a large, known population of GFIs in Bavaria (150). For the application of the second phase of analysis (qualitative interviews), further selections of cases were necessary and based on:

(1) Variety of analytical types of GFIs: e.g., based on actor composition and actor influence or roles; goal composition and goal priority; program type of GFI; political district; ecosystems;
(2) Overall 'success' (high vs. low goal fulfillment) of the GFIs as perceived by the actors;

As noted earlier, despite of the large number of cases, the results of this analysis are limited to GFIs and to Bavaria in a strict sense, but can most likely be generalized and provide interesting insights to research and practice, for similar regions, with respect to small-scale private forest ownership patterns and mountain landscapes.

3. Results

In order to describe, what repertoire of instruments Bavarian GFIs apply and whether they apply a mix of traditional and new instruments (NEPIs; see above: research question 1 and 2), I used an instrument typology, adopted from Prittwitz [2] (Figure 2), as an analytical reference point (see Figure 3).

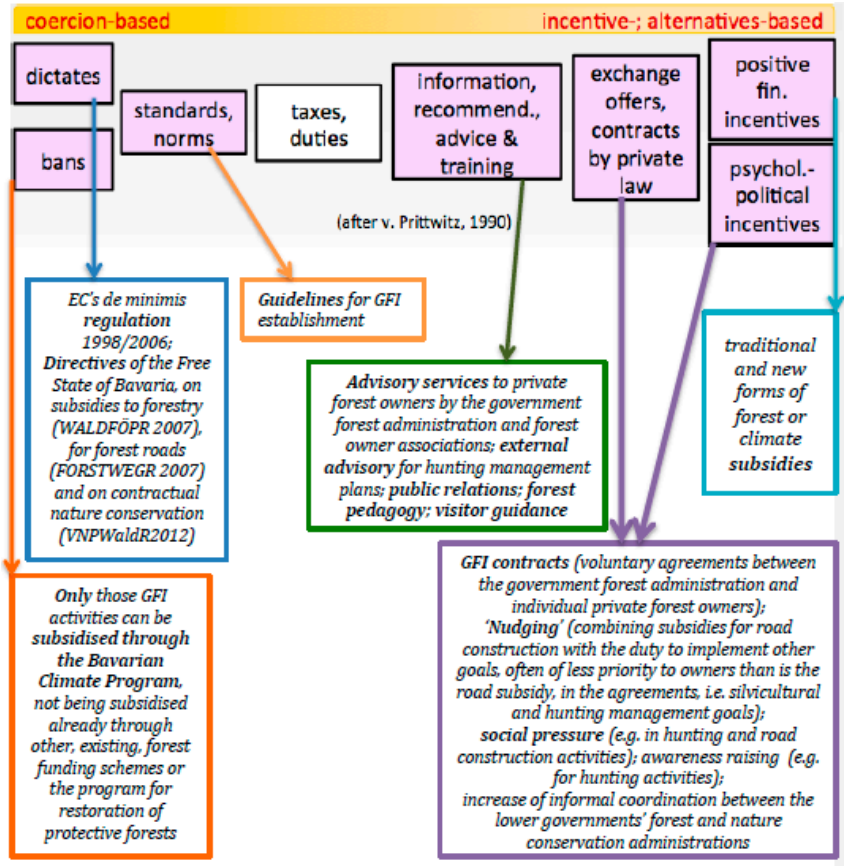


Figure 3. Overview and empirical examples on the instrument mix applied in GFIs.

As can be seen from Figure 3 (above), indeed, the Bavarian GFIs used a broad variety of instruments, both, traditional and new ones, to support and facilitate a range of activities in priority areas of forest landscapes. The instrument repertoire ranges from more coercion based dictates and bans, i.e., basically the legislation and rules behind subsidy schemes, to a broad variety of more incentive or alternative based instruments, i.e., advisory services, public relations, forest pedagogy, visitor guidance, GFI-contracts, nudging, social pressure and subsidies, wherefrom the most innovations of instruments can be found.

Some traditional instruments were modified for the use in GFIs only (e.g., the maximum percentage of funding for road construction and improvement). Other instruments were newly created for the purpose of GFIs, i.e., GFI guidelines and especially the GFI-contract, containing itself a package of various instruments. GFI-contracts, i.e., the voluntary agreements between AELFs and individual private forest owners (PFOs), are the key instruments of GFIs.

With respect to positive financial incentives (see Figure 3), in addition to traditional forms of forest related subsidies (forestry and forest road subsidies, contractual nature conservation, subsidies for the restoration of protective forests), new 'climate subsidies' were/are made available through the Bavarian Climate Programs 2020 and 2050, following the European Commission de minimis regulation (see Figure 3: dictates) and banning double funding of the same activities (see Figure 3: bans). As noted, some funding rules of traditional schemes were thereby adopted, only for the use

within GFIs. Guidelines (see Figure 3: standards and norms) were established, on the range of activities that could or should be implemented by the GFIs and on the establishment of Round Tables and the actors that can be considered for the participation processes.

GFIs applied also a broad variety of informational instruments (see Figure 3: information, recommendation, advice and training). Most prominently are advisory services to private forest owners, which were provided especially by AELFs and, if involved, also by FOAs. These services related, among others, to silvicultural activities, individual or joint harvesting operations and road construction or improvement. For the development of hunting management plans or for moderation or mediation activities, external advisory was provided occasionally, by hiring individual experts. Some GFIs also implemented extensive public relation measures (e.g., GFI newspapers, events, branding), forest pedagogical activities or visitor guidance in areas of high recreational pressure or frequency.

The key instrument used in GFIs, are the GFI contracts (see Figure 3: exchange offers, contracts by private law; psychological-political incentives), i.e., voluntary agreements, between AELFs and individual PFOs. In combining subsidies for activities being well received by many PFOs (i.e., road construction or improvement), with obligations for other activities, PFOs usually did not assign a high need for action to (i.e., forest conversion or hunting), a psychological-political instrument was introduced, in other words nudging 'in the forests'. In addition to this, AELFs often succeeded to transfer a vertical relationship into a horizontal one, i.e., in creating social pressure within local society (e.g., for the implementation of hunting and road construction activities), but AELFs or GFIs in general also applied awareness raising measures (e.g., related to hunting management).

Table 1 provides us with a more comprehensive overview on instrument application, across various GFI goals or activity areas, contributing to answers on above research questions (number 1 and 2). In addition, it shows that certain goals, e.g., sustaining the protective functions of forests, implementing forest conversion, hunting and/or alpine pasturing management concepts, were less likely to succeed (goal implementation), the more these goals were subject to conflicts (little flashes), despite being perceived as of strong priority, by the actors of GFIs, and despite of the application of a broad set of instruments (see research question 3, above). In other words, strong conflicts, related to changes in the management or use of forests, anticipated by GFIs, and/or to the application of instruments that should support such changes, prevented goal implementation to reach strong success on private forest owners' land, despite these goals gaining strong support from influential GFI-actors and despite their endeavors to provide a broad package of instruments to reach these goals. Only for road construction activities, the use of a great variety of instruments led to strong implementation success of a highly supported goal, under conditions of limited conflict (see research question 3, above). Only a few GFIs evolved larger conflicts on road construction.

Due to the novelty and complexity of the voluntary agreements (vA), and to further describe how the 'nudging in the forests' worked or did not work, I need to provide some more details, from the qualitative and document analysis of GFIs. As vAs were used to address several goals, the below explanations provide also more insight to the nature of important conflicts, affecting the implementation success of key goals (e.g., forest conversion, sustaining the protective functions of forests).

The vAs usually included a road construction activity, stating, e.g., 'Description of the measure: construction of a hauling road. Afterwards forest measures (e.g., thinnings) must take place, which have to be implemented in consultation and cooperation with the AELF (. . .)'. Further they included a part on 'financing or costs', e.g., stating '80% of the eligible costs (costs of road construction including VAT) will be financed through the budget of the GFI. The exact share of co-payment can be provided only after invitations to tender or after the final invoice. Presently we suppose the co-payment to range from 210 to 230 euros per hectare of forest within the development area'. In a subsequent section 'follow-up measures' are defined, e.g., stating 'Silvicultural measures (e.g., thinnings) in consultation and cooperation with the AELF (e.g., the marking of trees is done by the government forest officer).' (from a GFI contract).

In some GFIs, this type of nudging did not succeed, but raised or increased existing land-use conflicts, which led to the termination or hold-on of these GFIs. The reasons for these conflicts related mainly to the following parts of the vAs. The vAs state, 'The beneficiary of the contract ensures, within a binding period of five years after the completion of the measures, not to do or fail to do anything, which opposes or impairs the goals of the measures'.

Further the vAs note that 'the requirement for the implementation and financing of measures, by the government forest administration, is the statement of intend of all the stakeholders in the project area, to support the implementation of this hunting concept'. Further, 'if damages caused by game as per §§ 29 ff BJG (found by the beneficiary or the AELF) occur within the project period or the subsequent binding period, the beneficiary will report timely to the responsible municipal authority about the occurrence of game damage as per § 25 AVBayJG', and subsequently 'the government forest administration can terminate measures ahead of time and terminate the contract without notice, if it emerges that the goal of the measure (stable and climate tolerant mixed mountain forest) can not be reached, due to damages by hooved game' (from a GFI contract).

Some forest owners and hunters have then turned to the juridical committee of the Bavarian hunting association, which assessed the vAs and concluded (source: original assessment) 'such a paper should not be signed'. More precisely, they found forest owners would have to 'tolerate permanent access by government forest officers', they would 'oblige themselves to report and enforce any game damage, identified by the opposite party or the AELF', to the responsible authorities, they would 'need to participate in or tolerate "hunting concepts"—however they may look like' and the owners would also bear the liability for premises regarding electric fences on pastures and many more issues'. The committee further concluded 'the draft contract includes regulations, which are unclear in their current state, which bind the land owner to contractual commitments and time spans, which are unforeseeable and, further, the hitherto financing, from which also the land owners shall benefit, appears to be completely ambiguous', while on the other hand it seems to be clear 'that an accountability of the Bavarian State Forests (own comment: here they should actually refer to the Bavarian state forest administration) is limited to intention or gross negligence and that the land owner does not hold any enforceable title to secure payments for the financing of this project, if no government funding is available anymore, however, inversely the owner must stay in the contractual relationship'.

The above position has also spread across PFOs and hunters in the region. In a reaction, by an AELF (source: original communication) it was highlighted 'This is a model contract, valid for all GFI projects and it must not be changed. The used financial resources should serve as effectively as possible the goal to sustain a stable mixed forest. Many land owners had concerns in the current projects, but most of them we were able to dispel. The formulations are often interpreted in a wrong way. For instance, in road constructions no reclamations of subsidies are applied, this would be the case e.g., in a reforestation.'. However, at least in a few GFIs and for some owners in the region, this was not considered good enough by the owners to join, stay or support the GFIs.

Above, several key theoretical elements or assumptions on the advantages of NEPIs or their involvement in more modern policy instrument mixes, as compared to purely conventional, traditional instrument use, were mentioned. Table 2 compares these theoretical elements or areas for potential improvements with actual empirical observations in Bavarian GFIs, in order to answer the question, if modern instrument approaches can lead to an improved effectiveness and legitimacy (see: research question 3, above).

Table 2. Comparison of theoretical new environmental policy instrument (NEPI) advantages with empiric observations.

Theoretical Element	Observation in the Case	Empirical Examples
Governing as an instrument mix	++	traditional & new subsidies; (round tables); public relations
Participation (power distribution)	+ (rarely)	actor number/diversity varies; few influential actors; round tables are rare; modest participation of private forest owners (PFO)
Coordination	0 ... ++	esp. political-administrative, informal; government: + personnel capacities; municipalities, forest owner associations (FOAs); nature conservation
Knowledge-integration	0 ... +	better exchange & acceptence, ? integration; very limited funding flexibility
Effectiveness	? (0 ... +++)	long-term (climate resiliency) ?; short-term: modest: forest conversion, high: roads
Legitimacy	0 ... + (+++)	inclusion of municipality & (FOAs); PFO-participation?; (symbolic: Round Tables?; Public Relations)

Legend: Degree theoretical elements are supported by empiric evidence (observations): strong ++, moderate +, minor/no 0, unclear ? support, () support with restrictions.

Between government and governance, the appearance of NEPIs is considered to lead to a concept called governing, which is based on the creation of a new instrument mix, including more traditional as well as new policy instruments. Indeed, in the Bavarian GFIs, a mix of traditional and new funding or subsidy possibilities was established, opening up alternatives, by creating new funding areas, the opportunity to fund joint activities or by increasing the funding amounts for certain activities within GFIs.

Following the concept of forest landscape priority areas, advisory services to private forest owners were, at least partly, changed from supply-led to more demand-led schemes. However, partly these schemes are practices simultaneously. In some regions, Round Tables (RTs) were established for, sometimes, regular meetings of actors, to enhance participation and moderate the GFIs. Partly these RTs were subject to external mediation or moderation services, especially in GFIs/areas with higher initial conflicts.

In addition to RTs, some GFIs also established joint excursions or on-site inspections, with a more or less regular schedule. RTs, but also beyond, were also used to build up or transfer social pressure on those parts or representatives of the local society, not willing to participate (enough) in the implementation of certain goals (e.g., to report browsing damages by the game to officials). In RTs, individual groups, i.e., local private forest owners, local hunters and local pasture keepers, were usually represented by one or more selected people (invited by the AELFs), who were not elected by their community, hence informal representatives. They usually had a strong social prestige in the local region and, depending on their attitudes or activeness to pioneer activities (e.g., in forest conversion, joint harvesting or road construction), they are termed as strategic multipliers in the area of the GFIs. This worked well, where the representatives had a positive attitude towards the anticipated activities, but less well, if they did not have or if the AELFs and their project managers did not succeed

to convince these persons. In the latter case, this has led also to the termination or stagnation of GFI development, but only in few GFIs.

Further, psychological incentives, i.e., nudging, were applied in the context of the main new instrument, the GFI-contracts, being voluntary agreements, between individual private forest owners and the AELFs. Thereby the provision of higher than usual road construction or improvement related subsidies, well received by many private forest owners, were combined with the obligation to undertake certain measures or activities related to silviculture or hunting, which private forest owners, being sometimes simultaneously hunters, farmers and pasture keepers, usually did not perceive so well or which they have seen controversially. Traditional forest subsidy schemes applied to some of the silvicultural activities as well and the AELFs were entitled to regularly oversee the progress of any GFI activity on-site.

Last, but not least, in some GFIs more extensive public relation measures (regular newspapers or events), forest pedagogical activities or visitor guidance measures were implemented.

A variety of strategies [6] were, mostly successfully, applied in the overall program and GFI development: (a) empty formula acceptance, i.e., with respect to the adaptation of forests to climate change; (b) close-up and long-distance acceptance, i.e., the combination of short- and long-term goals and effects, e.g., forest road construction as opposed to forest conversion; (c) ideological acceptance, i.e., forest road construction is necessary for the climate adaptation of forests and finally (d) symbolic acceptance, i.e., local protection from changes of the climate.

While there is some support that the new instrument mix, used in GFIs, led to more participation, there is very limited evidence that participation was practiced in a way that has led to the sharing of more decision-making power with other actors. The number and diversity of actors involved in the networks of GFIs differed a lot and physically existing RTs are rare and sometimes even not a new 'invention'. Even in GFIs with a long development history, after eight years only seven per cent of private forest owners (PFOs) participated in GFI activities. In some, few GFIs, mediation processes failed.

Improvements related to coordination, due to the use of a new approach and instrument mix in GFIs, can be seen controversially across the analyzed GFIs. In well established GFIs, key forestry actors, i.e., the AELFs themselves, but also municipalities, forest owner associations (FOAs) and PFOs, were able to reach influential roles. AELFs could gain additional personnel capacities, to implement GFIs, i.e., especially to focus on the local priority area and a demand-based approach, although sometimes these staff had to informally compensate for personnel shortages in traditional competency areas.

Occasionally positive coordination was established with nature conservation organizations and local, lower government nature conservation administration, in a few GFIs also with recreation and education actors. A major drawback in the conception of GFIs relates to staff fluctuations, i.e., the short-term limited contracts of project managers, which led to the loss of trust among actors and individuals within GFIs and affects the effectiveness and efficiency of instrument and goal implementation, due to a loss of capacities. Despite clear evidence and suggestions proposed in trans-disciplinary working groups (Aurenhammer and Koch, 2017b), this situation has not improved and recently the prolongation of any staff, including GFI project managers, has been prohibited, after some project managers succeeded to get their contracts' time limits removed, in compliance with court decisions. However, at the ministry level, the forest administration has now established a permanent 'node', i.e., a person experienced with GFIs, to support GFI development and build on previous experience (pers. comm. with a representative of the government forest administration).

There is little evidence on changes related to knowledge integration. GFIs have succeeded partly in a more intensive exchange of subject-related, e.g., forest, expertise and in the exchange of societal knowledge. Less clear is, whether GFIs also led to an integration of, especially alternative knowledge or expertise and societal knowledge, in the development and implementation of GFI activities. The acceptance of forest expertise, especially by those PFOs not previously active, is considered as marginal or moderate. Despite adaptations in the funding schemes for GFIs, local PFOs still perceive

their underlying funding demands as being not flexible enough to help them to implement activities or innovations developed a bit out-of-the box.

The use of NEPIs or a new policy instrument mix in GFIs should also lead to increased effectiveness. Indeed, short-term effectiveness is strong, especially for forest road construction or improvement measures, also, because often many actors benefit from roads, e.g., for harvesting access, which is also needed to undertake thinnings and other silvicultural measures, including forest conversion; for the access of recreationalists to forests; for the access to forest areas that need biotope management to sustain capercaillie populations or for landscape protection measures and even for hunters, to establish and have better access to their stands. With respect to long-term effectiveness, i.e., forest conversion to increase the climate resiliency of forests, the present results are marginal. Even in GFIs with a long engagement history, forest conversion measures were implemented only on an annual average of 0.5 per cent of the priority forest area. It remains to be seen, if, in the longer-term, the improved road access will actually lead to more climate resilient forests. The 'administrative effectiveness', i.e., the input of subsidies into the socio-ecological system, can range from 40 to 130 euros per hectare and year and is clearly higher in GFIs than the average subsidies disbursed to PFOs in the region, reaching an average of about 24 euros per hectare and year (2009-2013). There could not be found any relation between the effectiveness of GFIs and their legitimacy, i.e., the diversity of actors, involved in different GFIs.

Using the instrument mix, however, can lead to successful forest conversion, regeneration of instable forest stands, increased thinning activity and improved road access. By addressing various forest functions, in an integrated approach, GFIs are enabled to reach out to a larger number of owners, actors and to society at large. A mere focus on forest conversion, harvesting or wood mobilization can instead provoke resistance and lead to non-change. While the number or diversity of actors and ideas does not affect the quality or success of implementation, it increases (at least initially) coordination efforts. If you want to maintain longer-term cooperation and support of multiple actors, you need to take care of the longer-term success of societal or silvicultural measures. For such measures, necessary longer-termed resources should be scheduled.

With respect to the theoretically anticipated legitimacy benefits in the use of NEPIs or a new policy instrument mix, analysis of GFIs show marginal benefits. This can be reasoned with the better integration of especially municipalities and often also FOAs, but is clearly limited by the generally marginal participation of PFOs. A different impression can be achieved, when looking at the more symbolic side of policy. Symbolically 'legitimacy' is generated successfully, by proclaiming the existence of RTs, although these are rare and are not or only partly open to the general public. Instead, they are participation arenas, limited to the key actors of GFIs, i.e., especially AELFs, municipalities, FOAs and PFO representatives as well as with varying influence also hunting representatives.

4. Discussion and Conclusions

This paper analyzed the use of NEPIs and instrument mixes in modern, participatory government forest initiatives (GFIs), in Bavaria. The analysis of GFIs extended quantitatively to 44 initiatives, 16 of which were analyzed using data from qualitative, semi-structured interviews (175 people).

The key research questions traced in this paper are:

(1.) What repertoire of instruments GFIs apply?
(2.) Do they apply a mix of traditional and new instruments (NEPIs)?
(3.) If so, does such a mix of instruments lead to improving effectiveness and legitimacy?

In order to describe, what repertoire of instruments Bavarian GFIs apply and whether they apply a mix of traditional and new instruments (NEPIs) or not, an instrument typology was used, as an analytical reference point, based on Prittwitz [2]. It was assumed that, given the long tradition in developing and implementing GFIs in Bavaria, it would be likely to find a broad mix of instruments being applied, including more innovative, new policy instruments. Based on the above typology, the analysis revealed that GFIs indeed used a broad variety of instruments, both, traditional and new

ones, to support and facilitate a range of activities in priority areas of forest landscapes, which is in support of the above assumption.

Some traditional instruments were modified for the use in GFIs only (e.g., maximum percentage of funding for road construction and improvement). Other instruments were newly created for the purpose of GFIs, i.e., GFI guidelines and especially the GFI-contract, containing itself a package of various instruments. GFI-contracts, i.e., the voluntary agreements between government forest administrations (AELFs) and individual private forest owners (PFOs), have been and are still certainly the key instruments of GFIs. This also adds to the theoretical discussion, on how the more traditional and the new instruments may work together. The empirical results suggest, at least in the case of GFIs in Bavaria, most likely a layering of instruments took place, i.e., the 'grafting' of new instruments on top of traditional instrument repertoires [18]. In some instances, also a fusion [13,17] of instruments can be observed, e.g., when various traditional and new instruments as well as various goals are bundled and it is at least tried to closely interlink them, under the umbrella of GFI-contracts, e.g., using nudging as a modern approach. Looking at it from 'outside the GFIs', i.e., looking on private forest management policy, more generally, the above changes and innovations in instruments could also be considered an example of layering [18], i.e., traditional instruments remain existing, but, in selected areas, additional, modern instruments are applied or can be selected 'on top' of the traditional ones. This would be in accordance with current literature, suggesting that layering and fusion are the most likely forms of modern instrument mixes; an assumption I also followed in this paper. Anyway, results did not support the elimination of traditional instruments.

Digging a bit deeper, the paper came up with a more comprehensive overview on instrument application, across various GFI goals or activity areas. It found that certain goals, e.g., sustaining the protective functions of forests, implementing forest conversion, hunting and/or alpine pasturing management concepts, were less likely to be implemented successfully, the more these goals were subject to conflicts, despite being perceived as of a strong priority, by the actors of GFIs, and despite the application of a broad set of instruments. Only for road construction activities, the use of a great variety of instruments led to strong implementation success of a highly supported goal, under conditions of limited conflict. Only a few GFIs evolved larger conflicts on road construction. In accordance with recent literature, it was assumed that the application of a broad set of instruments, including modern instruments, would lead to more effectiveness, to a stronger implementation success. This expectation is only partially met, with respect to road construction activities. It seems that a broad, modern instrument portfolio does not so easily guarantee strong success, talking about goals that are more prone to land-use conflicts and of longer term character and/or in situations with conflicts, related to (the style of) instrument application itself.

The paper also analyzed if the use of a mix of instruments by GFIs led to improving effectiveness and legitimacy more generally. This is a relevant question, because developing more complex policy instruments, i.e., 'New Environmental Policy Instruments' (NEPIs), is considered to help to avoid many problems of more traditional instruments in environmental governance [4].

Advantages of NEPIs are seen in increased actor participation, coordination and knowledge integration, which again would lead to more effectiveness and, maybe, also to more legitimacy of the environmental policy [11,20,21]. The analysis takes advantage of these theoretical elements or areas for potential improvements, through the use of NEPIs or modern instrument mixes, and compares these with actual empirical observations in Bavarian GFIs, in order to answer the question, if modern instrument approaches can lead to an improved effectiveness and legitimacy. Given the use of modern instruments in GFIs, it is assumed, according to the literature, to observe improvements in the effectiveness and legitimacy, more specifically in governing, participation, coordination and knowledge integration.

From the analysis of GFIs in Bavaria, it can be concluded that the application of a modern mix of instruments did lead to an increase of short-term effectiveness, especially in road construction or improvement, also because of a broad actor interest in roads. However, with respect to long-term

effectiveness, especially regarding forest conversion to increase forests' climate resiliency, the present results were marginal. To date, the use of NEPIs and a generally more complex instrument mix, in Bavarian GFIs, did not result in a clear success of solving complex environmental problems or climate change effects, although in the literature, NEPIs are considered or hoped to solve such complex problems. The empirical results from GFIs, however, contradict with the assumptions in this paper and accordingly that of the current literature.

Despite the application of nudging [24], 'in the forests', nudging did not yet show its advantages over more traditional instruments, such as social pressure or awareness raising, when thinking of silvicultural and harvesting measures to increase the climate resiliency of forests. It was actually shown that nudging in the forests can result in increases of conflicts and non-action or participation of some forest owners and hunters negatively affect a whole region or may lead to the stand-by or termination of GFIs, in some cases.

To contribute with a discussion on the above conclusions, it remains to be seen, if, in the longer-term, the improved road access will actually lead to more climate resilient forests, i.e., through forest conversion (active forest management); it might also be that increasingly frequent calamities will do that part of the work, affecting poorly adapted forests; then actually road access is an advantage, considering hauling of logs from calamity areas or possibly reforestation with, maybe, climate tolerant species.

Improvements could be made both with respect to instrument design and application as well as continuity and increase of government forest administration staff and capacities, considering the long-term Climate Program 2050; which could be well argued, given the currently strong discourse and public involvement in climate change issues. Maybe a more flexible design of the voluntary agreements and of eligibility criteria of funding schemes could increase the share of forest owners willing to participate and could enable processes of civic-knowledge integration and the development of more innovative, alterative-based, local solutions. Indeed, given the currently strong commitment of civil society to issues related to climate change, this could also be an opportunity to involve civil society more broadly in GFIs or maybe to jointly develop new forms of forest related long-term development initiatives, taking advantage of a broader set of ideas, capacities and local/regional needs. However, unlike the public engagement in the general climate hype or in the recent initiatives to save the bees, the topic of adapting forest use and management to climate change might be less attractive or too clumsy for the general public or contributions could be limited to forest uses or services of priority to only some interest groups. It would be interesting to know more about the goals and expectations of current climate related movements regarding forest use and management or about the role forests play for these movements more generally.

An increased engagement of forest owners and the civil society, more generally, could also improve the legitimacy of GFIs, as the presently used modern instrument mix led only to marginal legitimacy benefits. These marginal benefits are mainly due to a better integration of municipalities or FOAs, but are thwarted by the marginal participation of individual PFOs. If GFIs want to maintain longer-term cooperation and support of multiple actors, they need to take care of the longer-term success of societal or silvicultural measures. For such measures, necessary longer-termed resources should be scheduled.

Supplementary Materials: The following are available online at http://www.mdpi.com/1999-4907/11/2/168/s1, Sheet S1: Introduction, Sheet S2: SNA-based sampling and influence analysis—questions, Sheet S3: SNA-based sampling and influence analysis—response sheet, Sheet S4: SNA-sampling-based perception analysis—initiative's goal priority and fulfillment, Sheet S5: SNA-sampling-based perception analysis—actor beliefs beyond the initiative.

Funding: This research has received funding from the European Union's Seventh Framework Programme for research, technological development and demonstration under grant agreement No. 613762. No funds for covering the costs to publish in open access were received.

Conflicts of Interest: The author declares no conflict of interest.

Appendix A General Part

Example of a guideline for interviews with actors from government initiatives, here for Bavarian state forest administration initiatives.

Guideline for the actor interviews on government initiatives

Start with a friendly introduction, thanks, introduction of your person... (you will need to adopt this guideline to the type of actor interviewed).

Appendix A.1 Basic Data (Only Ask the Forest Administration; Only If Data Has not been Received Yet)

Initiative duration (years, period): _____ financial volume (Euro): _____

Forest area of the initiative (ha): _____ Part of area on which measures have been implemented to date (ha): _____ Previous work effort in man-years: _____

Number of forest owners (FO) in the area: _____, mean size of forests owned: _____ha; number of FO to date involved in measures: _____, mean size of their forest land: _____ha;

Harvests done in the area to date: ____ m^3; _____m of hauling or forest roads constructed; _____ ha of forest conversion; _____ FO participating in trainings or other events.

Appendix A.2 Formation and Phases of the Initiative (Possibly Adopt Questions to the Type of Actor Interviewed)

Start of the initiative...

(1.) How (where) the idea to start the initiative was formed?—Who has decided to go for it?
(2.) Why do/did you (actor) actually take part?—What are your benefits from this initiative?
(3.) Why has the initiative been established exactly in this forest area—Who has decided this?—How has it been decided?

Duration of the initiative...

(1) How cooperation is/was shaped?—(e.g., forms of cooperation?; invitation or selection of actors/persons?; changes in the form of cooperation?)
(2) Does the initiative make a difference to conventional cooperation?—To what extent? (Dis-)Advantages?
(3) Assess shortly the following statements (does not apply at all … 0—applies very strongly … 10):

Due to the cooperation I had:

(a) additional efforts/burdens: ____ (0-10)—how/what type of ?: ____
(b) no direct benefits, but the opportunity to support something 'good': ____ (0-10)—how?: ___
(c) the opportunity to prevent fatal or unwanted developments: ____ (0-10)—how/what type of?: ____
(d) the opportunity to establish a win-win situation based on our joint efforts: ___ (0-10)—what type of?: ____
(e) the opportunity to implement my own individual interests/goals more successfully: ___ (0-10)—how/what type of?: ____
(f) Anything else coming to your mind?'

(4) Are there any actors who should have been included better? Who/Why? Are there any actors who themselves did not want to participate (or contribute)? Who/Why?
(5) What superior-level political actors were important for the initiative? (e.g., associations, ministries, parliament, other sectors...) Who in the initiative was in contact with these actors?

Change, pullout, re-formulation, conflicts/problems … in the initiative …

(6) Often initiatives pass through different phases*. Have you noticed such phases, characterized by 'important' decisions or changes?—What kind of phases? What happened? Why? Who did decide or bring this about or strongly influenced this? How?

(Start of initiative, formulation of measures, prioritization of measures, financing, implementation, adaptation/change/pull-out and finalization/continuation/re-formulation of the initiative).*

Appendix A.3 Forest Land-Use Change, Perceptions, Success

(7) Did the initiative lead to changes in the use or management of forests or in the awareness/decision-making regarding the use/management of forests? What exactly happened that led to such changes? (How/Why something was/has changed?)

(a) What do you think about these changes? (+/0/-?)
(b) Did there occur any natural impacts? (calamities: bark-beetle, wind, snow/ice -induced damages...)

(8) Was the initiative, in your opinion, successful? What was (not) successful? Why?

(you may link this to the initiative-specific results on goal preferences and implementation).

Appendix B Initiative-Specific Part

Appendix B.1 The Role of Third-Party-Actors (C-e, W, C-d)

(1) What actors, in your opinion, are/were important for the initiative? (Any missing?; state the actors identified in the SNA or show the initiative-specific list/table; if the interviewee is part in more than one initiative, keep separate notes).
(2) Why? What makes these actors actually so important (or less important)?

*(Example: Why do e.g., communes/forest administrations/FOAs gain sometimes so important roles, sometimes not?)***!.**
First, wait for the response on the open-ended question, then:

(a) What qualities, resources or competencies (capacities) these actors possess? Why and How—do they thereby obtain an important role in the initiative/for you? Refer to results/the initiative-specific table: reg. information/expertise, financial, material, personnel, time resources, irreplaceability (formal or informal competencies: e.g., in decision-making, in the implementation, in providing allowances).
(b) Did certain actors gain especially much resources or strong trust through the initiative? (e.g., financial means; informal co-/decision-making- or representation-'rights'; expectations, leap of faith) Did this create any dependencies? (What type?)
(c) How do you assess the willingness or motivation of actors to participate, contribute to or support the initiative? (very high, high, low and very low) Why? How to explain the respectively high or low willingness or motivation of actors? Reasons? Motives?

! *Go/guide through the list/table of actors identified (expect for the actor currently interviewed); first, keep it an open-ended question; then refer to possible factors; note down all responses exactly and (later) summarize them in below table. Continue questioning: Why is it like this? How does it work? Is there any evidence in terms of documents/receipts/proofs or forest locations that can be visited? Adopt the list/table of actors for 'other actors' as needed in the initiative.*

Appendix B.2 Role of the Interviewed Actor (c.p. Appendix A.1. for Forest Administrations)

(1) General Data *(not for forest administrations)*
Previous financial contributions: _____€ (own financial means), _____ € (external funds): from _____

Previous work effort in man-years: _____; for individuals: leisure time spent: _____ h or days/year

Assignation or swap of rights, of land; provision of material resources (free of charge; at special rates), e.g. of machinery, premises, vehicles: _____

if possible, ask for evidence (receipts, documents, photos ...)

(2) Kind of work in/for the initiative: *(not for forest administrations)*

Previously participated in: Harvests ____ m^3, of which joint harvests (e.g., thinnings) ____ m^3; hauling road/forest road construction ___ m; ___ ha of forest conversion; ____ trainings/events

Planned: ____ m^3; ____ m; ___ ha (incl. planting)...

(3) Role/marketing of wood and non-wood forest products (not for all actors: but for e.g., forest administration, municipality, forest owners, FOAs):

a. Is the harvested wood sold to local, small/medium sized sawmills, wood-processing companies, energy utilities (<=10,000m^3/year capacity, <100km)? What companies? Approx. % of the harvested wood?
b. How much wood is used approx. for personal demands (e.g. firewood)? (_____ %)
c. How much wood is sold to distant (>100km) and/or globally acting companies (capacities > 100,000 m^3)? (____%)
d. Game and other non-wood forest products?
e. Tourism, craft, others?

More details for interviews with FOAs: (consider wood originating from the initiative's area and total wood marketed by the FOA needs to be indicated separately).

Size of Company by Capacity (m^3/year)	Share of Marketed Wood (in %)
<=10,000 m^3	
10,000–50,000 m^3	
50,000–100,000 m^3	
>100,000 m^3	

Distance to Buyers (Companies)	Share of Marketed Wood (in %)
<=100 km	
>100 km	

Type of Buyer (Company)	Share of Marketed Wood (in %)
Sawmills, other wood-processing	
Paper-, board-, cardboard-industry	
Energy utilities	
others: (e.g., trade companies) ____	

Special questions for possible use in in-depths interviews with actors

1. Initiative-specific special questions on actors (these will differ from initiative to initiative; use the enclosed materials: tables, figures on SNA-based results):

(do not use questions on the role of the actor currently being interviewed; only use the below questions, if the above parts did not provide answers yet or issues were controversially discussed).

Examples:
According to our results...

(a) actor xy did not have any important role in the initiative. Do you agree? Why is this? *(actor is not willing or is not able to contribute; actor should better not contribute)*;
(b) the xy agency played an important role in the initiative. Do you agree? Why is this? *(why the actor is willing or able to contribute so strongly; should the actor have such a strong role?)*;
(c) the xy administration holds a rather weak position in the initiative. Do you agree? Why is this? *(actor is not willing or is not able to contribute; actor should better not contribute)*;

In initiatives also problems can emerge … According to our results ...;

(d) … there were severe problems with actor(s) xy. What was it all about?

2. Initiative-specific questions on the interviewed actor
(to check for the role of the actor, from his own point of view)

(a) Did you attach special importance to this initiative? (Why/not?)
(b) Did you implement your goals/interests? (e.g., What goals (not)?; How?)
(c) Have you been able to change something with your own resources or additional resources you received from others? (What, How?)
(d) Did others prevent or hinder you in reaching change/goals? (Who/How?)
(e) Were you actually aiming to achieve any change? (What kind?; Why /not?)
(f) In initiatives also problems occur. … What were they about?

3. Special issues related to preferences/goals (*results from the questionnaires of a specific initiative*)
3.1. In our analysis a number of key goals were identified and evaluated:
Example:
Nature and water protection measures (very high priority compared to other projects); fulfillment: 1.35/3.
Society and recreation; fulfillment: 1.5/3.
Roundwood harvesting, marketing and roads; fulfillment: 1.5/3.
Average fulfillment of initiative's key goals: 1.4/3.

a. Does this fit to your observations?
b. Why above-mentioned goals are so important to the initiative?
c. Do these priorities reflect also your own interests?
d. What exactly has happened in these key areas?
e. Why did the actors consider the goal fulfillment as rather low? What is this up to—can you give me examples? What could be improved, what could be lessons learned for other initiatives?
f. The hunting management was considered as successful (2.0/3.0)—What exactly has been implemented here?

3.2. Our results indicate, challenges to future forest land-use should be facilitated by certain key-actors and through a set of 'most appropriate' instruments. Do you agree? What should be changed and how?

Example: main facilitator/most appropriate instruments:

Overall (across all challenges): 52% opt for the state—through laws, public relation/awareness-raising, counseling/training:

- *Seventy-five percent opt for the state: to solve hunting issues (laws 58%) and for nature protection on private forest land (counseling, public relations, positive financial incentives).*
- *Seventy-five percent opt for individual forest owners: to solve wood production on private forest land (counseling, incentives, public relations, standards).*

- *Fifty percent each opt for associations and individual forest owners: to solve wood marketing from private forest land (with a mix of standards, counseling, public relations, liberal price formation).*
- *One-hundred percent opt for the state: to sustain the protective functions of forests (by means of laws and counseling).*

Table A1. Initiative-specific attachments (here standardized).

Factors, explaining the role of actors		Interviewee refers to **Capacities** an actor holds or gains: *(ask: What type of ? Why and How?)*				Interviewee refers to the **Willingness** of an actor *(ask: Reasons for high/low willingness)*	
Actors *(except the interviewee's organization)*	Important? Yes/No	Info	Trust	€, Time, personnel, material	Irreplaceable: formally/in-	Willingness (e.g., high/low)	e.g., Specific values, interests, (social) norms
Forest administration							
Forest owner association							
Municipality							
Forest owner							
Hunters/-assoc.							
Companies							
Other administration							
others... (see initiative)							
others... (see initiative)							
others... (see initiative)							
others... (see initiative)							
others ... (interviewee)							
others ... (interviewee)							

actor nr.	C	D	E	F	G	H	I	J	K
code	allgemeine Information	forstliche Information	Vertrauenswürdigkeit	finanzielle / materielle Ressourcen	personelle oder zeitliche Ressourcen	Unersetzbarkeit	Probleme	Gesamteinfluß	Selbstevaluierung
1	22	22	33	33	33	0	0	28	0
2	67	11	67	11	22	67	0	56	33
3	22	11	33	22	22	33	0	22	33
4	33	33	22	11	22	33	33	33	100
5	17	8	8	8	8	0	25	8	###
6	8	8	17	0	8	0	0	0	###
7	17	17	25	0	0	25	25	0	###
8	42	42	50	25	25	50	17	21	###
9	25	8	25	0	17	25	0	8	###
10	25	8	25	0	8	25	0	17	###
11	21	21	25	25	25	0	0	21	###
12	25	25	25	25	25	0	0	21	###

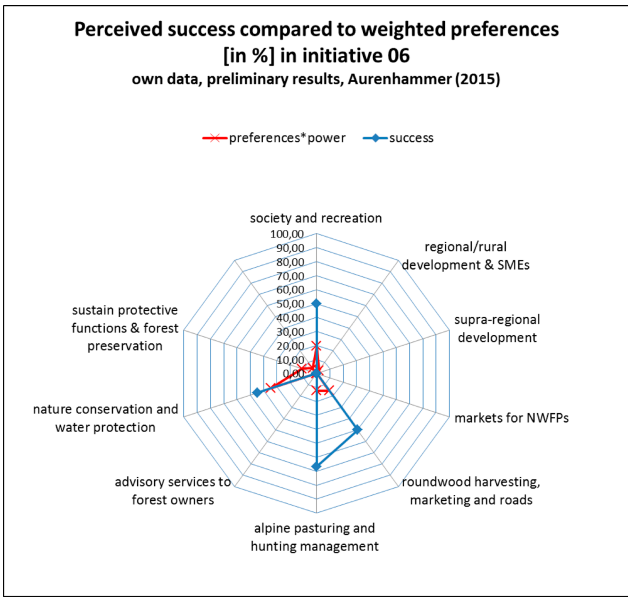


Figure A1. *Cont.*

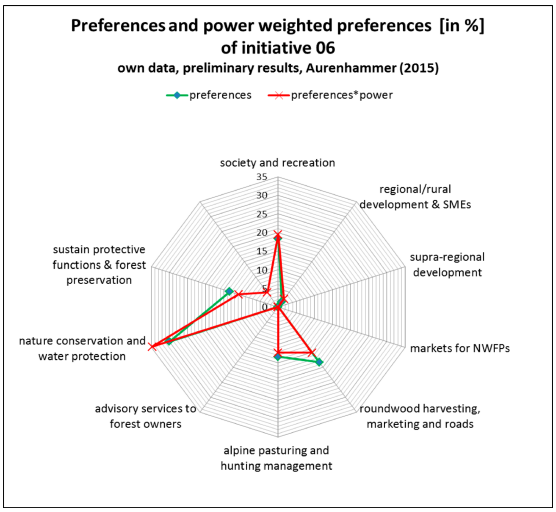


Figure A1. On the top: table to be used to summarize interviewee's responses on other actors roles (capacities, willingness); below: SNA-based results, e.g., tables on influence, figures on goal priorities and fulfillment of the specific initiative, used as background-material for interviews.

References and Note

1. Aurenhammer, P.K. Forest land-use governance and change through Forest Owner Associations-Actors' roles and preferences in Bavaria. *J. For. Policy Econ.* **2017**, *85*, 176–191. [CrossRef]
2. Prittwitz, V. *Das Katastrophen-Paradox, Elemente Einer Theorie der Umweltpolitik*; Leske and Budrich: Opladen, Germany, 1990.
3. Krott, M. *Politikfeldanalyse Forstwirtschaft. Eine Einführung für Studium und Praxis*; Parey: Berlin/Wien, Germany, 2001.
4. Huppes, G.; Simonis, U.E. *Environmental Policy Instruments in a New Era*; WZB Wissenschaftszentrum Berlin für Sozialforschung, Forschungsschwerpunkt Technik-Arbeit-Umwelt: Berlin, Germany, 2001.
5. Kooiman, J. *Governing as Governance*; Sage: London, UK, 2003.
6. Krott, M. *Forest Policy Analysis*; Springer: Dordrecht, The Netherlands, 2005.
7. Aurenhammer, P.K. *Development Cooperation Policy in Forestry from an Analytical Perspective*; Springer: Dordrecht, The Netherlands, 2013.
8. Aurenhammer, P.K.; Olivar, J.; Sabin, P. *Análisis de Tres Iniciativas Forestales en Castilla y León Mediante el Método Analítico Centrado en los Actores: Papel de los Actores Implicados, Preferencias e Implementación (Analyses of Three Forestry Initiatives in Castilla y León, Using the Actor-Centred Analytical Approach: Actors' Roles, Their Preferences and Implementation)*; Paper for the Spanish Forestry Congress; LWF: Geneva, Switzerland, 2017.
9. Aurenhammer, P.K.; Ščap, Š.; Triplat, M.; Krajnc, N.; Breznikar, A. Actors' potential for change in Slovenian Forest Owners Associations. *Small Scale For.* **2018**, *17*, 165. [CrossRef]
10. Aurenhammer, P.K.; Ščap, Š.; Krajnc, N.; Olivar, J.; Sabin, P.; Nobre, S.; Romagnoli, F. Influential actors' perceptions on the primary facilitators and instruments for solving future forest land-use disputes, by the example of European regions. *Forests* **2018**, *9*, 590. [CrossRef]
11. Hogl, K.; Kvarda, E.; Nordbeck, R.; Pregernig, M. *Environmental Governance. The Challenge of Legitimacy and Effectiveness*; Edward Elgar Verlag: Cheltenham, UK; Northampton, MA, USA, 2012.
12. Aurenhammer, P.K. Network Analysis and Actor-Centred Approach–A critical review. *J. For. Policy Econ.* **2016**, *68*, 30–38. [CrossRef]
13. Wurzel, R.K.W.; Zito, A.R.; Jordan, A.J. *Environmental Governance in Europe. A Comparative Analysis of New Environmental Policy Instruments*; Edward Elgar Verlag: Cheltenham, UK; Northampton, MA, USA, 2013.
14. Krott, M. Integrierte ländliche Entwicklungskonzepte-Vom Papiertiger zum Handlungskonzept. In *Zukunft der Ländlichen Entwicklung in Deutschland-Bausteine des Erfolgreichen Wandels Zukunft der Ländlichen Entwicklung in Deutschland-Bausteine des Erfolgreichen Wandels*; BMVEL: Berlin, Germany, 2004; Volume 7, pp. 161–167.

15. Van Gossum, P.; Arts, B.; Verheyen, K. "Smart regulation": Can policy instrument design solve forest policy aims of expansion and sustainability in Flanders and the Netherlands? *For. Policy Econ.* **2012**, *16*, 23–34. [CrossRef]
16. Weiss, G. Evaluation of policy instruments for protective forest management in Austria. *For. Policy Econ.* **2000**, *1*, 243–255. [CrossRef]
17. Eberlein, B.; Kerwer, D. New governance in the EU: A theoretical perspective. *J. Common Mark. Stud.* **2004**, *42*, 121–142. [CrossRef]
18. Streeck, W.; Thelen, K. (Eds.) *Beyond Continuity: Institutional Change in Advanced Political Economies*; Oxford University Press: Oxford, UK, 2005; pp. 1–39.
19. Jordan, A.; Wurzel, R.; Zito, A. New modes of environmental governance: Are "new" environmental policy instruments (NEPIs) supplanting or supplementing traditional tools of government? *Politische Vierteljahresschr.* **2007**, *39*, 283–298.
20. Wolf, K.D. Legitimacy of governance beyond the state. In *Governance and Democracy: Comparing National, European and International Experiences*; Benz, A., Papadopoulos, Y., Eds.; Routledge: London, UK, 2006; pp. 200–228.
21. Bäckstrand, K.; Kahn, J.; Kronsell, A.; Lövbrand, E. (Eds.) The promise of new modes of governance. In *Environmental Politics and Deliberative Democracy*; Edward Elgar Publishing: Cheltenham, UK; Northampton, MA, USA, 2010; pp. 3–27.
22. Hood, C. *The Tools of Government*; Macmillan: London, UK, 1983.
23. Hood, C. Intellectual obsolescence and intellectual makeovers: Reflections on the tools of government after two decades. *Governance* **2007**, *20*, 127–144. [CrossRef]
24. Kuehnhanss, C.R. Nudges and nodality tools: New developments in old instruments. In *Routledge Handbook of Policy Design*; Howlett, M., Mukherjee, I., Eds.; Routledge: Abingdon, UK, 2018; Chapter 15; pp. 227–242. [CrossRef]
25. Goven, J.; Pavone, V. The Bioeconomy as Political Project: A Polanyian Analysis. *Sci. Technol. Hum. Values* **2015**, *40*, 302–337. [CrossRef]
26. Krott, M.; Riedel, A. Finanzielle Förderung als Instrument der Staatsforstverwaltung. *Vgl. Eur. Staaten. Eur. Forstverwaltung* **1995**, *5*, 146.
27. Galanter, M. Justice in Many Rooms: Courts, Private Ordering and Indigenous Law. *J. Leg. Plur. Unoff. Law* **1981**, *13*, 1–47. [CrossRef]
28. Scharpf, F. Die Handlungsfähigkeit des Staates am Ende des zwanzigsten Jahrhunderts. In *Staat und Demokratie in Europa*; VS Verlag für Sozialwissenschaften: Wiesbaden, Germany, 1992; pp. 93–115.
29. Héritier, A.; Rhodes, M. (Eds.) *New Modes of Governance in Europe. Governing in the Shadow of Hierarchy*; Routledge: London, UK, 2011.
30. Krippendorff, E. *Kritik der Außenpolitik*; Suhrkamp: Frankfurt am Main, Germany, 2000.
31. Pierre, J.; Peters, B.G. *Governance, Politics and The State*; Macmillan: Basing-stoke, UK, 2000.
32. Schuppert, G.F.; Zürn, M. (Eds.) *Governance in Einer Sich Wandelnden Welt*; Politische Vierteljahreschrift, 41, special issue, 1-600; Springer: Berlin/Heidelberg, Germany, 2008.
33. LWF. *Intensivierung der Waldpflege und Steigerung der Nachhaltigen Holznutzung als Beitrag zum Klimaschutz Sowie Intensivierung des Waldumbaus*; Teilprojekt KLIP 5–Evaluierung und Leitfaden. Erfahrungsbericht. Dezember 2009; Bayerische Landesanstalt für Wald und Forstwirtschaft: Freising, Germany, 2009.
34. Aurenhammer, P.K. The integrative approach in Bavaria: A successful model for the activation of forest owners. In Proceedings of the SIMWOOD Final Conference, Paris, France, 13 October 2017.
35. StMELF. *Klimaprogramm 2020*; Leitfaden BWO. Interne Kommunikation; 2008.
36. Schreiber, R.; Aurenhammer, P.; Koch, M.; Kies, U.; Kleinschmit von Lengefeld, A.; Vuillermoz, M. SIMWOOD–Nachhaltige und Innovative Mobilisierung von Holz. *AFZ DerWald* **2015**, *21*, 38–40.
37. Aurenhammer, P.K.; Koch, M. *Activation of Forest Owners to Engage Them in Sustainable Forest Management with Special Emphasis on Alpine Forest-Functions*; Report on and Evaluation of the Pilot Project in Schwaben, Bavaria; LWF: Geneva, Switzerland, 2017.

38. Aurenhammer, P.K.; Koch, M. *Summary of the Results from the Survey of Working Group Members Regarding Their Priorities for Future Areas of Recommendation Development as well as Further Steps for the Joint Development of Recommendations*; A technical report to the Bavarian State Forest Administration Working Group on recommendations for future private forest owner counselling, based on results from SIMWOOD analysis; LWF: Geneva, Switzerland, 2017. (In German)
39. Aurenhammer, P.K. *Actors and Their Role in Bavarian Forest Initiatives' Networks and for the Management Decisions of Private Forest Owners*; Focus Study Report to the EU-FP-7 project SIMWOOD; SIMWOOD: Bristol, UK, 2015.
40. Della Porta, D. Comparative analysis: Case-oriented versus variable-oriented research. In *Approaches and Methodologies in the Social Sciences. A Pluralist Perspective*; Della Porta, D., Keating, M., Eds.; Cambridge University Press: Cambridge, UK, 2008; pp. 198–222.
41. Della Porta, D.; Keating, M. How many approaches in the social sciences? An epistemological introduction. In *Approaches and Methodologies in the Social Sciences. A Pluralist Perspective*; Della Porta, D., Keating, M., Eds.; Cambridge University Press: Cambridge, UK, 2008; pp. 19–39.