Forest Policy and Economics xxx (2011) xxx–xxx

Contents lists available at ScienceDirect

Forest Policy and Economics

journal homepage: www.elsevier.com/locate/forpol

Forests policy analysis and theory use: Overview and trends

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ARTICLE INFO

Article history:
Received 3 April 2010
Received in revised form 2 December 2010
Accepted 3 December 2010
Available online xxxx

Keywords:
Policy sciences
Forest policy analysis
Policy theories
Theory use

ABSTRACT

This paper provides an overview of theories currently used in forest policy analysis. It also examines trends in theory use over time. The aim is to assess whether the sub-discipline of forest policy analysis deviates from the "mother discipline" of the policy sciences, and if so, how and to what extent. In addition, theory use in the journal *Forest Policy and Economics* is ranked. The paper can help researchers identify relevant theories for structuring their data collection and analysis on forest policy. It concludes that forest policy analysis has become rather "current" (i.e. well-embedded in the mother discipline), but that it only gained this status relatively recently.

1. Introduction

Forest policy analysis began as a sub-discipline of the forest sciences. This meant that it was foresters, rather than policy scientists, who primarily became involved in forest policy analysis. As a consequence, the role of theory in such analyses remained limited. Also, the analyses tended to be normative and oriented towards policy advice (Glück, 1992). Two decades ago, however, this situation began to change fundamentally. Foresters became more knowledgeable about policy theories when forestry curricula at several universities around the world started to introduce policy courses, both at the BSc and MSc level. In addition, policy scientists became more involved in forest issues, probably because "green politics" had become a serious topic within their discipline. Today, readers of forest journals that include policy analyses encounter many policy theories that are fashionable in the "mother discipline" – such as neo-institutionalism or discourse analysis. This article provides an overview of the use of and trends in such theories in the forest policy sciences, from contemporary and historical perspectives. By doing so, it offers a systematic introduction to this Special Issue on theory use in forest policy research.

The format of this paper is as follows. First its methodology is explained, which is based on content analyses of policy sciences' handbooks and on literature searches in the database Scopus. Secondly, it presents a systematic overview of current policy theories and a topography of these theories. These form the basis for the literature search in the third step, which leads to rankings of most popular theories in current policy analysis in general as well as in forest policy analysis in particular. But this literature search also allows trends to be determined over time. It shows how theories come and go in scientific disciplines and sub-disciplines. Finally, the paper draws some conclusions on the "theoretical state of the art" in forest policy analysis.

2. Methodology

There are several handbooks from which one can deduce an overview of current and relevant policy sciences theories. However, most of these books present categorizations of theories that are entirely or partly different. So how can we choose one? We decided to identify three leading handbooks on policy theories and based our own overview of theories on their common grounds. Our decision to limit the study to three handbooks is obviously rather arbitrary. But we intuitively thought that less than three would be too few to be a serious sample of the literature. On the other hand, we thought more than three would make the task unnecessarily complicated. Moreover, we found that the handbooks also have considerable overlap, so that a fourth book would probably not have delivered much additional information (saturation principle).

The criteria for choosing "leading" handbooks were: (1) their authors are well-known scientists in their fields, (2) these volumes are regularly used in curricula and (3) they are regularly cited. After the three books were selected, their categorizations of policy theories were compared and common ground was sought for designing a systematic overview of policy theories for this paper. The criteria for "common ground" were: (1) the theories listed should be referred to in all three, or at least in two of the three books (overlap principle); (2) the list of theories should be as short as possible, while giving the most possible information at the same time (parsimony principle).

The overview that resulted consisted of a rather disordered list of theories. We therefore introduced a "topography" in order to position

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doi:10.1016/j.forpol.2010.12.003

the various approaches with respect to each other. This will enable readers, particularly students of forest politics, to recognize the various approaches with a limited number of dimensions. This topography was built on earlier work (Arts and Leroy, 2006). It used two classical 'schisms' in the social sciences. The first one concerned the actor-structure problematique (Giddens, 1984). The question is whether historical, social and political outcomes are the result of the intentions, motivations and behavior of individual agencies, or whether these are shaped by the social structures of societies, like political institutions, power hierarchies and cultural conventions. This debate, which dates back to the origin of the social sciences in the 18th century, is also referred to as the one between voluntarism (agency>structure) and determinism (structure>agency). Of course, social theorists have tried to find a middle road between these two extremes in order to do justice to both actor and structure, often referred to as structuration theory (Giddens, 1984). However, discussions have shown that it is difficult for theorists to escape favoring one over the other. Therefore, we believe that the actor-structure dimension is still a valid axis on the basis of which different theories and models can be positioned.

The second schism refers to the idealist–materialist divide, which dominated western philosophy at the end of the 19th century (Inglehart, 1997), but which has been revived in recent movements, such as the "argumentative turn" in the social sciences in the late 1980s (Fischer, 2003). The question is whether ideational factors (ideas, narratives, discourses, culture, ideologies) or material factors (resources, technology, capital, infrastructures, land) drive human history, social change and political outcomes. The classical example of this debate is the conflicting interpretations of Marx and Weber of the rise of capitalism. Marx believed that capitalism was driven by the development of the productive forces, while Weber believed the protestant ethic was the driving force (Inglehart, 1997). Current discussions may deal with aspects such as the rise and fall of new social movements, to be explained either by resource mobilization (material factors) or framing processes (ideational factors) (Snow and Benford, 2000; Zald and McCarthy, 1980). Since this debate still seems be relevant today, we decided that the idealist–materialist dimension is a second valid axis for positioning various theories.

In the next step, the topography of policy theories served as input for an analysis of theory use in the forest policy sciences, to be compared with the policy sciences in general. For that purpose, the Scopus database, which contains vast number of scientific papers, was used to search the main international peer reviewed journals. Scopus also includes an extensive search engine, which can be used to construct samples of literature. We used this database instead of ISI Web of Sciences because it includes more journals, particularly newer and smaller ones (and indeed, forest policy sciences is a rather new and small sub-discipline) and because it is more user-friendly (at least according to this author). For this paper, we performed three searches, one on the policy sciences in general, one on the forest policy sciences in particular and one very specific search limited to the journal *Forest Policy and Economics*. In addition – to develop, test and check the reliability of the method – the searches were reiterated three times (in Spring 2008, Winter 2009 and Spring 2010).

We searched for the key terms "policy" and "forest policy" in the titles, keywords and abstracts of papers in Scopus. Content-wise, this is the most extensive search option, since texts of papers as a whole are not analyzed for key terms in this database. As scientific disciplines for the search, the social and environmental sciences were identified. The former are a logical choice, since the policy sciences are part of the much broader category of the social sciences. However, we also added the environmental sciences because all forest sciences journals in Scopus are categorized here, including those that deal partly or entirely with forest policy. Based on these restrictions (key terms, search options and scientific disciplines), the searches initially yielded two samples, one with about 215,000 papers (policy) and the other with about 780 papers (forest policy). The third sample of *Forest Policy and Economics* could be drawn from the latter as well, because Scopus indicates the journals in each sample of papers. This third group amounted to about 100 papers.

In a next step of sampling, the theories from the topography were used as key terms to further delineate the three groups of papers into "theory-specific sub-samples". The use of key terms and their synonyms in this step turned out to be crucial for the result. We decided to focus on combinations of words to avoid papers with obligatory references to "one concept without a theory", hence "institutional analysis" or "discourse theory" instead of only "institution" or "discourse". Also, we restricted the use of synonyms to the following extensions: -ism, theory, analysis, approach and framework. For example: institutionalism, institutional theory, institutional analysis, institutional approach and institutional framework. Subsequently, all hits were counted. It turned out that some key terms produced lots of hits (e.g. institutional analysis), but most just a few (e.g. institutional framework). Finally, the theories were ranked in terms of being most used (thus most popular) in policy sciences, forest policy sciences and *Forest Policy and Economics*.

In addition, it was also possible to make trend analyses over time. When one creates a sample or sub-sample of papers in Scopus, these are also grouped in temporal categories. For example, one can observe in what year a key term like "institutional theory" was referred to the most in a specific sample of papers. However, the sample from *Forest Policy and Economics* turned out to be too small (about 100) to see sensible trends for specific key terms over time.

This search method has, however, a number of drawbacks. First, if papers are selected on the basis of the presence of key words in their abstracts, the reference list is automatically included in the search as well. This cannot be separated in Scopus. For example, a rational choice paper that cites a Marxist book in the reference list with the term "Marxism" in the title (which is not that obvious, by the way) will also be marked, not only as a rational choice paper, but as a Marxist paper as well. However, deleting the abstract as part of our search was not an option, since the first mention of the application of a certain theoretical approach is normally done in the abstract, and rarely in the title and key words. Therefore we should interpret the notion of "theory used" as "theory used and/or referred to". This seems a fundamental flaw in the methodology which decreases validity of the findings. However, this interpretation of "use" applies to all samples and all theories in the context of this paper. As a result, the findings remain comparable, assuming that the flaws are relatively the same within each of them. Therefore we decided not to compare hits of key terms in an absolute sense, but only to rank them within each sample, sub-sample or temporal category.

A second drawback might be double counting of papers, as already shown by the example of rational choice and Marxism in the above. The same goes for the various synonyms we use for specific theories. Here again, similar papers might be counted twice, for example if they refer to both "rational choice" and "rational analysis" in their texts. Again, this is not considered a serious problem, because double counting will probably happen for all samples and all theories, so again, the figures remain comparable in a relative sense.

A third drawback concerns the use of key terms and their synonyms: how many should one use? Is the list complete? Should the number of key terms be similar for each theory? We strived for the latter, but this was not always possible; where one theory might essentially boil down to one framework, others might refer to entire families of theories (see below).

The fourth drawback is related to the trend that the number of papers will rise over time anyway, given its cumulative growth in current scientific practice. The question was therefore: how we could see temporal patterns? Since theories might rise *relatively* more or less than others, by ranking them in temporal categories, patterns would nonetheless become visible.

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Finally, it should be noted that both the handbooks and Scopus have Anglo-American biases. The handbooks contain theories that are most popular in the Western world, while Scopus contains very few scientific papers in languages other than English.

3. An overview and topography of theories

On the basis of authorship, use in curricula and citations, the following three handbooks were chosen (listed in alphabetical order): Fischer et al. (2007), Marsh and Stoker (2002); Sabatier (2007). It should be mentioned that the second book addresses political theories (and methods), whereas the other two specifically cover policy theories (and methods). Yet this is not considered problematic, because – after all – the policy sciences are nested in the political sciences. Especially when it comes to theory, the policy sciences often borrow from the political sciences.

Table 1 summarizes the list of theories of the three volumes. It should be mentioned that the first book lists families of theories, whereas the other two present both individual theories and groups of theories. Since it is impossible to work with individual theories in this paper – we lack the space and it would make a cumbersome overview – we decided to work with families of theories (with the exception of one, the ACF; see below for our argumentation). As common ground of these three volumes, we deduced the following list, based on the principles of overlap and parsimony (see above):

1 Rational policy analysis
2 Institutional policy analysis
3 Policy network analysis
4 Advocacy coalition framework (ACF)
5 Critical policy analysis

The list starts with the more classical and mainstream frameworks (rationalism, institutionalisms) and ends with the more recent and critical ones (networks, ACF, critical theory). All three books refer to rational policy models (respectively rationality, rational choice and stages approach). The same applies to critical theories (respectively deliberative policy analysis, Marxism and social constructivism). The other three families – institutional theory, policy networks and ACF – are dealt with by two books in our sample. However, those which were mentioned only once (comparative, normative, multiple streams and punctuated-equilibrium framework) were omitted from this paper. Now that we have explained our list, we will discuss the five families of theories, one-by-one.

Table 1
Overview of theories in the three books.

Fischer et al. (2007)	Marsh and Stoker (2002)	Sabatier (2007)
1 Policy process	1 Behavioralism	1 Stages approach
2 Politics, advocacy, experts	2 Rational choice	2 Institutional rational choice
3 Rationality, networks, learning	3 Institutionalism	3 Multiple streams framework
4 Deliberative policy analysis	4 Feminism	4 Social constructivism
5 Comparative, cultural, ethical	5 Interpretative theory	5 Policy networks
	6 Marxism	6 Punctuated-equilibrium theory
	7 Normative theory	7 Advocacy coalition framework

1. Rational policy analysis takes the premise of the rational-strategic actor as a starting point. This approach has at least two versions, an individualistic and a collective one. The central idea of the first one – rational choice – is that individuals make choices (political or otherwise) based on the highest expected individual utility or return, i.e. they choose the option from a range of choice alternatives which probably yields the highest benefits and lowest costs for themselves (Zafirovsky, 2006). 'Probably', because it is now widely accepted in rational choice theory that rationality is bounded (Simon, 1955). Although these choices might be rational (or rationally bounded) at the individual level, they might produce suboptimal or even negative outcomes at the collective level. That's why, according to these types of theories, that policies so often fail or produce suboptimal results. The other version of rational policy analysis, however, posits that political actors potentially have high collective problem solving capacities, i.e. that they are able to design an effective policy process based on scientific knowledge and rational argumentation (Sabatier, 2007). The policy cycle model (or stages approach), instrument choice theory and smart regulation perspectives are based on such premises. An example of rational policy analysis from the forest sciences is the paper of Oyono et al. (2005). These authors used (amongst others) rational choice theory to understand how a 'forestry elite' in Cameroon – a 'self-interested block', as they call them – contributes to maintaining strong inequality of access to forest resources. Local communities, who claim to have historical rights over these forests, are consequently worse off, even though a recent decentralization process in the country should have improved their situation.
2. Institutional policy analysis can be considered a critique of rationalism. It claims that rational choice and rational design are mediated by rules, norms and beliefs, to be defined as 'institutions' (Ostrom, 1992; Scott, 2001). People do not behave on the basis of the highest expected utility alone, or solely on collective rational argumentation, but on the basis of what is appropriate in a certain institutional setting. For example, corruption in politics may produce the best financial return for individuals, but in certain political cultures this is not an option at all. Today, most neo-institutionalists try to find a balance between actor and structure (Giddens, 1984). Agencies are conceptualized as strategically operating individuals and groups, taking into account both the consequences and the appropriateness of intended actions, while being enabled and constrained by rules, norms and beliefs at the same time. The addendum 'neo' implies that there is also a classical institutional approach. The difference is that the neo-institutionalists put more emphasis on rules (instead of organizations), informal institutions (instead of formal ones) and dynamics (instead of stability), amongst others. Different branches of neo-institutionalism can be distinguished (Hall and Taylor, 1996; Schmidt, 2005, 2008): rational choice institutionalism (how rational actors are constrained by rules of the game in their ranking of alternative options), historical institutionalism (putting emphasis on the historical evolution and stability of institutions), sociological institutionalism (emphasizing the role of culture) and discursive institutionalism (analyzing the role of ideas and narratives in institutional change). An example of an application of neo-institutionalism in the forest sciences is Sekher's (2001) study on common-pool resources regimes in community forestry in India. Building on Ostrom (1992), the effects of different local institutional arrangements on participatory forest management practices (with respectively NGOs, the local government and indigenous groups taking the lead) in three villages was scrutinized. Differences were indeed found, which yields interesting information for institutional design, such as effective participation and sustainable resource management.
3. Whereas rational choice theorists assume an individualistic ontology, and neo-institutionalists generally tend to favor

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structures over agencies, network theorists take "the social" as their point of departure. Individuals are considered social agencies, who interact with and depend on other actors in networks (Pierre, 2000; Kickert et al., 1997). Actions and decisions are not considered to be individual choices, nor are they driven by abstract structural properties such as rules, norms and beliefs. Instead, they are types of behavior that are socially mediated, hence related to other social beings. Networks pose both social constraints and opportunities on individual action repertoires. Often, particularly in the classical network literature, constraints are conceptualized as symmetrical or asymmetrical resource interdependencies between related actors or groups of actors. For example, because the state needs technical expertise and local support for effective policy implementation, participatory policy making in public-private networks seems a prerequisite for success, whether politicians and bureaucrats like it or not. An example of an application of network theory in the forest sciences is Krott and Hasanagas' (2006) analysis of cross-sectionality in forest policy and environmental policy. They show that, despite strong interests in maintaining sector autonomy, cross-sectionality is the unintended consequence of bridging social networks.

4. Advocacy Coalition Framework (ACF) is, unlike the others, not a family of theories, but a separate framework. It is strongly linked to one author: Paul Sabatier. Unlike policy network analysis, for example, it did not develop into a number of approaches within one family, but it has stuck rather strongly to the original model (with some amendments here and there). Yet the ACF, as a single framework, has probably been as influential in the policy sciences as the entire family of policy network theories. However, it has a different focus on social interactions (through advocacy coalitions), policy making (on the basis of belief systems) and policy change (through learning) (Sabatier, 2007). Unlike the abovementioned theories, the driving force for political action is assumed to be "shared belief systems" and not rational argumentations, socially appropriate behavior or interdependencies in a network. Beliefs are considered to be frames through which actors perceive the world, some of which are core beliefs and rather unchangeable (such as religious principles and norms), while others are more superficial and changeable (for example related to policy problems and technical solutions). The assumption now is that actors from different backgrounds who nonetheless share similar policy beliefs on a certain political issue form so-called advocacy coalitions, which generally compete with opposing coalitions in a plural political system. From this competition – in interaction with policy brokers and outside events – policy outcomes and policy learning may eventually occur. An example from the forest sciences is Memmler's (2003) study of the planned, but failed amendment to include ecological standards in the German Federal Forest Law in the late 1990s. He identified two advocacy coalitions within forest policy in Germany: a nature conservation coalition in favor of such standards and a forestry coalition that was against. The roots of both coalitions go back to the 1970s and both are held together by specific belief systems (based on ecological versus forestry world-views). Although the nature conservation coalition seemed to hold the winning hand at one time, a change in federal government closed this window of opportunity.
5. Critical policy analysis is a broad family of theories which includes theories as diverse as neo-Marxism, social constructivism and discourse theory. The reason to bring them together in one category – besides the existence of the journal *Critical Policy Studies* that covers the same family of theories – is that they generally distance themselves from the positivist or post-positivist paradigm, which is shared to varying degrees by the above theories. The positivist tradition claims that: (1) reality exists independently of our knowledge (the realist position), (2) natural and social sciences are analogous in principle (the naturalist position), and (3) science should (as much as possible) explain phenomena, generalize findings and separate facts from norms and values (the objectivist position) (Crotty, 1998). This mainstream philosophy of science is, however, fundamentally challenged, for example by "interpretative theory". This position rejects the notion that the world exists independently of our knowledge. On the contrary, it is claimed that, through scientific inquiry, scientists construct specific "facts" about the world (the constructivist position). Hence, there is no objective, real and independent world "out there," since our scientific assumptions and theories create its image and characteristics in the first place. Moreover, scientists – being people after all – are influenced by their normative environments (the anti-objectivist position). As a consequence, facts, values, norms and meanings are strongly intermingled. Also, a distinction is made between the natural and social sciences, because the objects – either nature or society – are so different (the anti-naturalist position). Since social scientists have to understand a socially constructed and mutually interpreted world, a double hermeneutics characterizes the social sciences. In contrast, the natural sciences are based on a single hermeneutics, because nature neither "interprets itself" nor "speaks back" to the researcher. Since it is impossible to deal with all critical policy theories here, we have selected the one out that currently seems the most popular: "discourse theory".

Discourse theory focuses on the power of language (Fischer, 2003; Van den Brink and Metze, 2006). The common assumption is that texts, concepts, narratives and epistemes – rather than 'objective' interests, institutions, social networks or belief systems – matter in politics and consequently shape the identities, ideas, interests and choices of political agencies. Hajer (1995: 44), whose definition is very often cited, defines a discourse as:

> "A specific ensemble of ideas, concepts, and categorisations that are produced, reproduced and transformed in a particular set of practices and through which meaning is given to physical and social realities."

With this definition, Hajer stands in the Foucauldian tradition, in which discourse and social practices are intimately linked. For Foucault (1994), societal and scientific discourses – for example on sexuality and health – define what subject identities and social practices are acceptable in a society, and which ones are not. In other words, discourses exercise power over agencies and discipline the subject towards 'normal' behavior. Hence, discourse and practice are closely related. Others, though, make an analytical distinction between discourses and language on the one hand and practices, agencies and action on the other. For example Dryzek (2005) considers a discourse as a way of "apprehending the world". Such definitions come close to collective frames that enable people to interpret the world and, subsequently, shape their actions. A third discourse – theoretical approach is the Habermasian one (Habermas, 1996). Here discourse and deliberations among citizens are considered synonyms. It is a normative and procedural approach that analyzes under which conditions "real" deliberative democracy can take place. The ideal is that all relevant arguments are heard in the democratic process and that the best argument wins on the basis of rational argumentation and consensual procedures. An example of an application of discourse theory in the forest sciences is Elands and Wiersum's (2001) analysis of socio-political discourses on rurality, rural development and forestry in Europe. They distinguish five ideal-typical discourses on this topic: agri-ruralist, hedonist, utilitarian, community sustainability and nature conservation. Each discourse has a different perspective on the role of forests and forestry in rural development.

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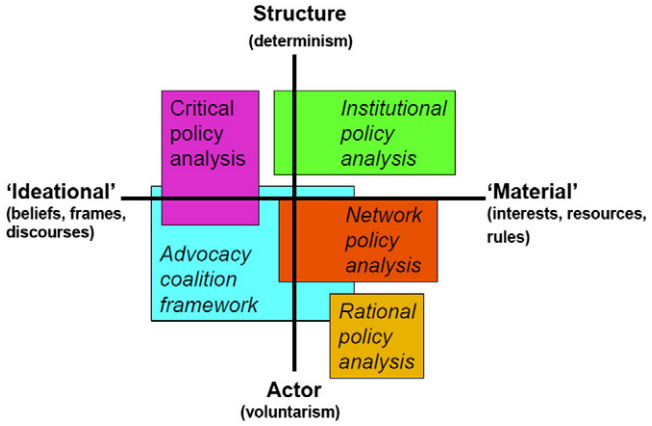

Fig. 1. Topography of policy theories.

Table 2
Rankings of theory families.

Policy sciences	Forest policy sciences	Forest policy & economics
(*N* = 215,006)	(*N* = 783)	(*N* = 103)
Rational policy analysis	Institutional policy analysis	Institutional policy analysis[a]
(*N* = 6014)	(*N* = 36)	(*N* = 16)
Institutional policy analysis	Policy network analysis	Rational policy analysis[a]
(*N* = 3867)	(*N* = 31)	(*N* = 16)
Critical policy analysis	Rational policy analysis	Policy networks analysis
(*N* = 3662)	(*N* = 27)	(*N* = 12)
Policy network analysis	ACF[a]	ACF
(*N* = 2166)	(*N* = 24)	(*N* = 10)
ACF	Critical policy analysis[a]	Critical policy analysis
(*N* = 1516)	(*N* = 24)	(*N* = 8)

[a] Similar scores, alphabetical order.

In Fig. 1, the two axes as explained in the methodological section are shown. The vertical axis represents the actor-structure problematique, the horizontal one the ideational-material divide. In the four cells that remain, the five families of theories as distinguished in the above are positioned relative to each other. However, positioning groups of theories is always a tricky thing. Families are not homogenous and theories develop over time. Therefore the various blocks cross axes and partly overlap. At bottom right we find rational policy analysis, given its focus on individual agency, self-interest, rational calculations and methodological individualism. In the same cell, we find network theory, although higher on the axis of voluntarism–determinism, because the focus shifts from the individual agency to social interactions and interdependencies. Since many network theories focus on resource dependencies, the family is located on the right of the figure, the "material" part. However, several network theorists also takes frames and framing processes into account, therefore the box crosses the vertical axis. The same goes for institutional theory. Many authors have a material focus (rules as "objective constraints"), but recently discursive institutionalism has become popular. This latter approach tries to bridge institutional and discourse theory. Concerning the Y axis, institutional theory is located above network theory, because structural properties such as rules are privileged over social interactions in theorizing.

In the upper-left quadrant we find the family of critical policy analysis. Many of its approaches favor a structural analysis over an agency-based one. For example, in most discourse theory, it is not the agency that is controlling its own thoughts and actions, it is the discourse that is shaping its social identity and subject position. Such a perspective, by the way, is often referred to as *post*-structuralist (while our topography refers to structure). Post-structuralism distinguishes itself from classical structuralism in the sense that structures are considered contingent – instead of historically determined – and are assumed to consist of other properties than traditionally acknowledged – e.g. language and discourse instead of capital and technology, such as in Marxism (Crotty, 1998). Also, the perspective on agency is different: where it is still a potential change agent in classical structuralism, it is "de-centered" in post-structuralism. With that, post-structuralism is the opposite and mirror image of rational theory, which is also shown in our topography (upper-left versus lower-right). But not all critical theory is post-structuralist in nature. Some theories attach more value to collective agency in discursive processes, others privilege individual sense-making and interpretation over grand discourses in their theories. Therefore, the critical policy analysis box crosses the horizontal axis. Finally, ACF is to be found in the lower-left quadrant. This framework is the most difficult to position. Its ontology is definitely individualistic, given its focus on individual belief systems. At the same time, though, it considers itself a subsystem analysis. In addition, it can be doubted whether it is a "real" discursive theory, since core beliefs are considered unchangeable cognitive devices, while the secondary policy and technological beliefs are assumed to be discursively fixed in advocacy coalitions. Also, much attention is given to resources as co-producing policy outcomes. For all these reasons, the ACF crosses both the horizontal and vertical axes.

4. Use and trends

The results of our search in terms of theory use and trends over time are shown in Tables 2–4. The first table presents the rankings of theory families in the policy sciences literature in general, in the forest policy sciences in particular and in *Forest Policy and Economics* (also including the absolute number of hits on which these rankings are founded). It shows that the classical theories – rational and institutional policy analysis – are still dominant in the general literature, while some newer ones – policy network analysis and ACF – score relatively higher in the forest policy sciences. However, the opposite is true for critical policy analysis: it is more popular in the general literature than in the forest policy one. These results can be interpreted differently. On the one hand, the forest policy sciences are a young sub-discipline, still strongly rooted in forestry, so that one could have expected a "laggard" position in the policy sciences and, hence, the use of more traditional approaches (see the strong position of institutional and rational policy analysis as well as the low ranking of critical policy analysis). On the other hand, one can also argue that a young sub-discipline lacks the path-dependencies of the mother discipline and mainly goes for current fashions in theory use (see the relatively higher rankings of policy network analysis and ACF). Obviously, both types of reasoning seem to have at least some validity. All the more so since the journal *Forest Policy and Economics* is positioned in between. Just as in the case of the policy sciences in general, the classical approaches are the strongest in this journal, but ACF and policy network analysis are used relatively more often as well, as is the case in the broader forest policy sciences. Again, tradition and fashion go hand in hand. Taking all three columns

Table 3
Ranking positions of theory families in the policy sciences over time.

	<1995	1995–2000	2000–2005	2005–2010
ACF	5	5	5	5
Critical policy analysis	2	4	4	3
Institutional policy analysis	4	2	2	2
Policy networks analysis	3	3	3	4
Rational policy analysis	1	1	1	1

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Table 4
Ranking positions of theory families in the forest policy sciences over time.

	<1995	1995–2000	2000–2005	2005–2010
ACF	–	2	1[a]	5
Critical policy analysis	–	–	5	3
Institutional policy analysis	–	1	3	1
Policy networks analysis	–	3	2[a]	4
Rational policy analysis	–	–	4	2

[a] Similar scores, alphabetical order.

together, though, the differences are not that big (with a top 3 of rationalism, institutionalism and critical policy analysis for the policy sciences in general and a top 3 of institutionalism, policy network analysis and rationalism for the forest policy sciences). With that observation, one might conclude that the forest policy sciences are: (1) rather current, hence, well embedded in the mother discipline of the policy sciences, (2) open to theoretical fashion, or put more positively, to theoretical innovation (given the higher rankings of some more recent theories), but (3) are still strongly rooted in positivism or post-positivism (given the low ranking of critical policy analysis).

Table 3 shows the trends in family rankings in the policy sciences in timeframes of five years. Overall, it represents stability. Fully or moderately stable are the positions 1, 2, 3 and 5 (rational policy analysis, institutional policy analysis, policy network analysis and ACF respectively). Only critical policy analysis shows more dynamics, namely a relative fall and rise over time. This may be related to the waning popularity of neo-Marxism among critical thinkers in the 1990s and the rise of discourse analysis in the 2000s. This is also referred to as the 'argumentative turn' in the social sciences (Fischer, 2003), although this turn is rather weak in the policy sciences (given the fact that rational and institutional policy analysis are still higher ranked than critical policy analysis).

Unlike Table 3, Table 4 shows many dynamics. Firstly, we observe the rise and fall of ACF. It seems to have lost attractiveness in the forest policy sciences. Maybe this is just 'model fatigue', maybe its decline is the mirror image of the rise of critical policy analysis, and particularly of discourse theory, the second observation which can be derived from Table 4. After all, the ACF is a cognitive framework that does not fit discursive theories well (see above). A third observation is the parabola of institutional policy analysis (rise–fall–rise). This could be a mirror image of ACF too, although more difficult to explain. These theories are neither competing nor complementing, so this might be just coincidence of – once again – an expression of fashion. In the late 1990s, ACF was so popular in the forest policy sciences that it pushed back all other theories, including institutional theories. Fourthly, policy network analysis show a similar pattern as the ACF: rise and fall. Obviously, these were the two main frameworks in the forest policy sciences of the late 1990s, early 2000s. Here again, the fall of policy network analysis in the late 2000s can be partly explained by the (relative) argumentative turn. After all, discourse theory does not fit well with positivism or post-positivism (on which the majority of policy network frameworks are based). A fifth observation is the hardest one to understand: the rise of rational policy analysis. Being a classical, dominant approach in the social sciences, it only gained momentum in the forest policy sciences very recently. This pattern might point at one of our above hypotheses, namely that the forest policy sciences lack the path dependencies of the mother discipline and mainly go for fashionable models. Only at a later stage are the traditions of the mother discipline revalued. A final observation is the fact that all theories are absent in the forest policy sciences literature published before 1995 and some even in the period 1995–2000. Therefore, compared to the policy sciences in general, they definitely are laggards in terms of theory use, although it should be recognized that the Anglo-Saxon bias in our literature search (see methodological section) may play a role here. For example, it is well known that German and Austrian foresters applied policy analysis before the 1990s (Glück, 1992).

Despite all this, one can nonetheless conclude that the forest policy sciences have become less descriptive over time, since theory use has grown. Hence, it seems that it has been professionalized recently. This empirical observation from Table 4 closely matches Glück's (1992): that the forest policy sciences have shifted from a descriptive and normative forestry-related field to a mature policy science sub-discipline.

5. Conclusion

This paper produced a list of five current families of theories in the policy sciences on the basis of three handbooks. These are (in alphabetical order): advocacy coalition framework (ACF), critical policy analysis, institutional policy analysis, policy network analysis and rational policy analysis. These families were positioned relative to each other in a graphical topography based on two dimensions: (1) the actor-structure problematique and (2) the divide between "ideational" and "material" theories. This topography enables students and scholars to recognize key characters of theories on the one hand and/or to make deliberate choices for certain theories on the other. In a second step, the use of these theories was assessed for three samples, drawn from the database Scopus: the policy sciences in general, the forest policy sciences in particular and the journal *Forest Policy and Economics*. This analysis shows that the forest policy sciences are: (1) rather current, hence, well embedded in the mother discipline of the policy sciences (given the use of similar theory families in both samples), (2) open to theoretical fashion and innovation (given the relatively higher rankings of recent theories, such as ACF and policy networks), but (3) still mainly rooted in positivism or post-positivism (given the low ranking of critical policy analysis). In addition, longitudinal trend analyses of theory use were conducted, both in the policy and forest policy sciences. These showed that in the late 1990s and early 2000s, ACF and policy network theories were very popular in the forest policy sciences, whereas the other families – rational, institutional and critical policy analysis – gained momentum only recently. This is partly related to the argumentative turn in the social sciences, although this turn began much later and is much weaker in the forest policy sciences. However, this laggard position is true for all theory use, since we observe hardly any application of theories in the forest policy sciences before 1995 (at least in the Anglo-Saxon literature). Nonetheless, it has grown substantially since then. Hence, the sub-discipline of the forest policy sciences has professionalized recently. It has shifted from a descriptive and normative forestry-related field to a mature policy sciences sub-discipline.

Acknowledgements

The author would like to thank Roel van de Graaf for doing the first Scopus analysis in 2008 (see Arts and Van de Graaf, 2009) and the members of the Political Theory Working Group of the *Forst Politiker Treffen*, particularly Georg Winkel, as well as two reviewers for their valuable comments and suggestions for improvements.

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Please cite this article as: Arts, B., Forests policy analysis and theory use: Overview and trends, Forest Policy and Economics (2011), doi:10.1016/j.forpol.2010.12.003

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Please cite this article as: Arts, B., Forests policy analysis and theory use: Overview and trends, Forest Policy and Economics (2011), doi:10.1016/j.forpol.2010.12.003