Forest management plan as a policy instrument: stick, carrot or sermon?

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Abstract

Technical aspects of forest management planning as decision-support have been addressed in numerous scientific studies. However, forest management plans (FMPs) also play a significant, but largely neglected, role as forest policy instruments. We have examined the policy context and planning practices in two contrasting case countries, revealing striking differences in policy instrumentation. In Sweden, FMPs mainly serve for informational steering, with under-utilised potential for providing individualised advice. In Lithuania, the plans are primarily regulatory, serving for effective control but with several deficiencies, notably excessive costs and institutionalised corruption. The study demonstrates that policy analyses can be fruitfully grounded in the empirics of planning practices.

Keywords: Forest management planning, policy tool, Lithuania, Sweden.

1. Introduction

Forestry is a distinctive land-use form characterised by long growing cycles of trees and multiple market and non-market benefits, with inherent tension between diverse interests in forest utilisation and protection. These characteristics predestine an important role of forest management planning that, technically, entails two core processes: assessing the state of forest ecosystems via forest inventory; and producing a forest management plan (FMP) that contains recommended forest treatments. The scope and detail of FMPs can vary depending on nature conditions and a national forestry tradition, the size and ownership form of the estate covered, forestland zoning by prevailing functions, etc. However, typical FMPs traditionally give primary attention to the timber production and span the planning horizon of 10 to 20 years.

Regarded from a *landowner perspective*, an FMP is a decision-support tool that provides management options for his/her estate, based on information about the estate's forest condition. Such conceptualization has framed numerous studies that have focused on technical aspects of planning such as inventory methods, data management, and scheduling of activities (Baskent and Keles, 2005; Lutz et al., 2008; Diaz-Balteiro and Romero, 2008; Ananda and Herath, 2009). In addition, increasing numbers of collaborative planning studies have considered social aspects (Martins and Borges, 2007), but these too are typically guided by the underlying aim of "optimising" plans, in terms of striking a sound balance between multiple benefits and/or preferences, often involving complex computational formulations.

From a *societal perspective*, FMPs also play a fundamentally different role in planning for small-scale private forestry. As baldly stated by the Swedish Forest Agency (SFA) (Mårtensson et al., 2003): "*A forest management plan is one of several instruments for implementing forest policy and an important aid in forestry advisory services*" (authors' translation). Taking another European example, the Lithuanian Regulations for Forest Management Planning (MELR 2003) define the aim of planning

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as follows: *"[…] to secure sustainable utilization of forest resources, balancing society's needs and owners' needs as well as requirements of forest policy*". These, and similar statements in sources from other countries, e.g. for Finland see (Hujala et al., 2009), clearly indicate that national forestry authorities tend to regard FMPs as important instruments for implementing forest policies. Nevertheless, relatively few authors have explicitly addressed the context, roles and effects of FMP as a policy instrument. A notable exception is a comprehensive evaluation of the effectiveness of Finnish forest management planning for private forest owners by Hokajärvi et al. (2009), who presume that the Finnish FMP is an informational instrument. In contrast, Serbruyns and Luyssaert (2005) regard the FMP as a mandatory policy instrument in Flanders, referring to the legal requirement to prepare FMPs for private forests covering more than 5 ha. Given the general lack of thorough analyses, it is uncertain whether an FMP could be simply assigned to a particular class of policy instrument – informational, regulatory or some other sort. To address this uncertainty, a number of aspects of the policy-planning interface need to be scrutinized, *inter alia*: the policy context within the relevant jurisdiction; the relationships between forest management planning and other policy instruments; the key actors and their roles; and the translation of formal stipulations and informal routines into actual planning practices.

Table 1. Selected forestry statistics and governance quality indicators[1], for Lithuania and Sweden/Götaland.

	Lithuania	Sweden[2]
Forest area, million ha (share of total land area)	2.2 (34%)	4.9 (58%)
Dominant forest species (shares of total volume)	Scots pine (37%), Norway spruce (20%), birch (17%)	Norway spruce (48%), Scots pine (30%), birch (10%)
Mean annual increment, m^3/ha/year	7.9	7.1
Share of total forest area under private, non-industrial, ownership, %	38	78
Share of forest area under valid FMPs in the total area of private forests, %	28	42
Average area of private forest estate, ha	3.3	38
Forest sector share of GDP, %	3.3 (4^{th} in the EU)	2.7 (5^{th} in the EU)
GDP per capita in purchasing power standard (EU27 = 100)	55 (24^{th} in the EU)	118 (6^{th} in the EU)
Global percentile governance ranks		
- Government effectiveness	73.3% (21^{st} in the EU)	98.6% (3^{rd} in the EU)
- Regulatory quality	79.5% (21^{st} in the EU)	96.7% (4^{th} in the EU)
- Rule of law	71.2% (21^{st} in the EU)	99.5% (2^{nd} in the EU)
- Control of corruption	63.8% (23^{rd} in the EU)	98.6% (2^{nd} in the EU)

Notes: [1] Share of private forest area under FMPs in Sweden estimated in 2005, all other estimates are for 2009. [2]GDP and governance estimates for the whole country, other indicators for the Götaland region of Southern Sweden (occupying 1/5 of the country's territory)

Sources: (MERL, 2010; Swedish Forest Agency, 2010; SFS, 2010; Ingemarson et al., 2007; Eurostat, 2010; World Bank Group, 2010)

Here we address these issues in a comparative analysis of forest management planning as a policy instrument in two case countries, Lithuania and Sweden; selected because they have similar natural conditions for forest management — as exemplified by the prevailing species and timber increments

(Table 1) — but markedly different historical trajectories of socio-political development and (hence) political contexts (Maciejewski, 2002). In terms of economic wealth and quality of governance, Lithuania and Sweden represent extremes among the 27 members of the European Union. Sweden has a prosperous long-standing market economy with high quality policy formulation and implementation (cf. government effectiveness in Table 1) and proven capacity to promote development of the private sector (regulatory quality). In contrast, Lithuania is one of the ex-socialist states that joined the EU in 2004. The country has faced major transitional challenges, requiring fundamental reconstruction of the entire system of governance while coping with cultural and institutional imprints of the Soviet period, such as the adherence to strong managerial hierarchies (Cook et al., 1998). Thus, examination of the policies and practices in the selected countries allows us to examine two hypotheses: (i) that instrumental policy roles of forest management planning may be similar in jurisdictions with similar natural conditions, given FMPs' common technical function to aid landowners' decisions, or (ii) substantially different due to differences in contextual factors.

2. Theoretical underpinnings

Policy science and public administration scholars provide numerous definitions of policy instruments. In our interpretation, a policy instrument is a deliberate structured effort by governors to solve a policy problem by modifying actions of the governed. Many authors of policy instrument studies have focused on the effects of selected public policies in selected jurisdictions with an aim, explicit or implicit, to improve those policies (Salamon, 2002). The instruments are not simply neutral options of choice in a policy toolkit; they are value-bearing policy outcomes manifesting the underlying aims and power structures. Therefore, analyses of policy instruments can potentially reveal more about the relationship between the governing and the governed "*than accounts of motives, or later discursive rationalisations*" (Lascoumes and Le Gales, 2007, p. 9).

Public policy instruments order relations between the governing institutions and the targeted civic society through technical and social intermediaries (Lascoumes and Le Gales, 2007). Forest management planning is an instrument of choice for executive forestry agencies to influence forest landowners, where the relevant legal stipulations, planning instructions and routines, forest inventory methods, and the resulting FMP, constitute the technical fabric. In his/her capacities as both a forest planning expert and practicing advisor, a planner embodies the critical social intermediary. Professional schooling and the technical fabric impose a certain degree of uniformity in planning practices. On the other hand, planners' responses to situational specifics vary due to differences in their individual perceptions, interests and skills. Regardless of the homogeneity, or heterogeneity, of their routines, the planners acquire the most comprehensive and functional knowledge of how the linkages between forest policy programmes and the owners play out in forest management planning practices.

For classifying policy instruments, we adopt the parsimonious trichotomy of regulatory, economic and informational instruments (sticks, carrots and sermons) advocated by Vedung (1998). Notably, we do not consider an organisation to constitute a class of policy instrument, as in some fourfold classification schemes, such as that proposed by Hood (1983). Instead we follow Vedung's reasoning that although the establishment and modification of organisations and infrastructures are crucial for a public administration they are prerequisites for instrumentation rather than policy instruments *per se*. Thus, in the analysis presented here, we do not question that forest management planning rests

on certain organisational structures, but focus on regulatory, economic and informational modalities of policy effectuation via FMPs.

An FMP may function as a "stick" by operationalizing legal stipulations in the form of compulsory forest management requirements for a specific estate. However, the regulatory nature of plans may vary due to differences in their scope and degree of coerciveness. Further, they may be coupled with economic "carrots", e.g. by making FMPs a prerequisite for obtaining subsidies, certification premiums or tax deductions. Finally, they may function as informational instruments, in two significant ways. First, the plans generate information about forest resources that could potentially be used by the public authorities. Second, FMPs can serve as "sermons", guiding and encouraging forest owners to pursue forest management practices that are perceived to be desirable. Indeed, forest management planning has vast potential for the provision of individualized advice, through direct interactions between owners and planners who have thorough knowledge of the owners' estates and are tasked with balancing policy objectives against owners' needs.

3. Materials and methods

Our analysis starts with a desktop research scrutinising the institutional substrate, i.e. the evolution of policies regarding private owners in the two case countries, and the emerging role of FMPs in the policy instrument mix. This sets the stage for the examination of procedures in the three main phases of forest management planning as defined by Mårtensson et al. (2003): (i) the *preparatory phase*, gathering information and preparation for a field inventory; (ii) *fieldwork*, i.e. the forest inventory; and (iii) the *final phase*, encompassing activities from the end of fieldwork to handing over the finalised FMP to the owner. Particular attention is paid to the planner-owner interactions in all three phases.

The major sources of information are semi-structured in-depth interviews with forest planners in both case countries. The interviews were intended to disclose a holistic picture of planning practices, grounded into the local context, and potentially revealing latent, underlying issues. Therefore the survey was of qualitative character (Miles and Huberman, 1994), dominated by open-ended questions and conducted with small purposive samples of planners (Table 2). The main criteria in sampling were the professional affiliation, working experience and geographic spread.

Table 2. Summary statistics of interviewed Lithuanian and Swedish forest planners (ages and duration of planning experience in years).

	No. of informants	Male informants	Age of informants		Planning experience	
			min-max	average	min-max	average
Lithuania	10	10	33-63	44	5-43	17
Sweden	12	11	33-65	48	3-26	13

Striving to examine perceptions by experienced professionals, the sample included respondents with extensive planning record and did not contain novices with less than 3 years of extensive planning practice. Seeking to control for possible regional differences, the respondents were selected to represent several forested regions of the case areas, namely Western, Central and Eastern Lithuania; and Western, Northern and Eastern Götaland in Sweden.

In Lithuania forest management planners typically start their careers in the state forest inventory and later engage in planning for private estates, on a part-time basis. At the time of the interviews, most respondents prepared FMPs for private owners as freelancers and only one was affiliated with a forest owner cooperative, which reflects the general distribution of planners' professional affiliation in the country. In southern Sweden, all informants were affiliated with one of two organisations that handle the largest proportions of FMPs: SFA, the national authority responsible for implementing forest policy (five informants); and Södra, the southernmost and largest private forest owners association (seven informants). SFA planners prepare and deliver some plans to forest owners directly, but a significant proportion via contracts with timber procurement companies and forest owners associations. Södra planners prepare FMPs solely for members of the association.

The interviews stimulated a flexible conversation about the planners' work, yet assisted by an interview guide organised in the following blocks of topics:

- The planner's profile and perception of planning goals
- The forest owners' profile, their motivation, level of forestry skills, etc.
- The planning procedure
- Contact with owners
- Prices and costs of FMPs
- Environmental and economic analyses in FMPs
- The nature of FMPs as policy instruments

Interviews were conducted in September-December 2010 by the first author of this study. Individual interviews lasted from 1 to 5 hours and were recorded electronically.

After scrutinising the policy context and planning practices, the analysis in this study is rounded up by critically examining the role of FMPs as policy instruments in both case countries. Departing from opinions of planners, we conclude with our own assessment, spotlighting the key issues.

4. Policy context

4.1 Sweden

Sweden has a long tradition of private forest ownership and related forest legislation. The first national Forest Act, focusing on mandatory forest regeneration, came into force in 1903. The legal process was to a large extent driven by rapid expansion of the Swedish forest industry during the latter part of the 19th century and accompanying societal concerns regarding the ability to meet industrial demands for raw material. Since the resource base was largely in the hands of small private forest owners it was deemed essential to regulate the use and management of private forests. The focus on timber supply was manifested not only in the initial Forest Act, but also in the creation, and remit, of governmental authorities responsible for implementing the enshrined policy and in later versions (1923, 1948, 1979) of the Act (Ekelund and Hamilton, 2001). In addition, during the first half of the 20th century private landowners formed forest owner associations aiming to balance the financial power of large industrial companies. Acting as producer cooperatives, the associations became important players in negotiations regarding timber prices. They developed own timber processing industries and still maintain the double role of producer cooperative and timber buyer. Thus, the associations are the main forest management advisors for their members and, together with other wood-buying organizations, the key promoters of the "high-production" paradigm.

FMPs were introduced on a considerable scale in the mid-19th century and today they are important elements of the administration and management of private forestry. For a long time, the plans consisted of a basic description of the stands on the estates concerned and recommended management actions for specified stands. The plans normally had a 10-year time horizon, hence strategic considerations were limited. During periods of anxiety about shortages of industrial supplies, the FMPs were regarded as effective instruments for increasing activity in private forestry, and thus harvests. Indeed, for a period in the 1980s there was a legal obligation to acquire FMPs for all forest estates covering more than 20 ha (Skogsstyrelsen, 1983).

During the last part of the 20th century, concern about the shortcomings of the single focus on high productivity, and intensifying discussions about the need to enhance other functions of forests, led to higher regard for nature conservation and recreational values and, hence, a structural change in forest policy (Bush, 2010). Accordingly, the first paragraph of the Forest Act of 1993 states, "*The forest is a national and renewable resource. It shall be managed in such a way as to provide a valuable yield and at the same time preserve biodiversity".* The Act is more liberal and less prescriptive than its predecessors with regard to permitted silvicultural practices. However, general nature conservation measures were stipulated in other legislation, supplemented by a mandatory prescription that all final fellings should be announced to the SFA in advance. Thus, if it deems that a proposed felling will not meet societal aims, the agency has the power to prevent the felling or insist that modifications be made. The liberalization of the act and formulation of multiple objectives was linked to the establishment of a "social contract" with private forest owners, meaning that if there was an active effort to pursue certification on private estates, the non-regulatory character of the legislation could be preserved.

The present situation, resulting from the developments described above, features "liberal" legislation, non-mandatory FMPs and commitment by the SFA and private forest owner associations to promote forest certification. This commitment has been primarily realised by developing the concept of the Green Forest Management Plan (GFMP). Each GFMP should fully comply with certification requirements and is the default option for certifying any estate. A GFMP is basically a standard FMP, supplemented with classified management goals for the forested area of an estate. For every stand on the estate concerned, a GFMP should specify a management goal, in four classes of a production-conservation gradient, ranging from wood production (with some general nature conservation considerations) to "setting aside" solely for nature conservation. To meet certification requirements, all estates exceeding 20 ha should have a GFMP and 5% of the area should be set aside for nature conservation (FSC, 2010). Since the stated goals are expected to be long-term commitments their inclusion introduced a strategic component to FMPs.

No statistics are compiled nationally on the coverage of GFMPs. Ingemarson et al. (2007) estimated that 42% of forest owners in southern Sweden (Götaland) possessed updated plans for their estate. The bulk of forest management plans are prepared by planners at SFA and forest owner associations, a minor share of the market being occupied by small companies specialised in planning. Forest landowners can freely choose whom to contract for preparing an FMP. Notably, forest owner associations partly subsidize FMPs offering about 30% lower price than SFA, while the latter appeals to the owners who do not wish to share the information about their estates with actors engaged in

timber procurement. While SFA and forest owner associations have different roles in governance, all plans have to live up to the established standards of GFMP.

Summing up, the owners regard GFMPs as decision support tools and prerequisites for obtaining certification premiums. Wood-buying actors, including forest owner associations, use them as contact surfaces with the forest owners that help to mobilize wood supplies and implement the prevailing management paradigm. The SFA sees GFMPs as a tool helping to promote desired management practices, including a higher regard for nature conservation.

4.2 Lithuania

The liberalization of forest policy and increased attention to environmental values in Sweden were minor shifts, compared to the revolutionary policy transformations in Lithuania sparked by the declaration of independence in 1990. A major agent of change in Lithuanian forestry was the restitution of private land property to the pre-war owners. At the start of 2010, 38% of the total forest area was in the hands of 242,000 private landowners (with average holdings of 3.3 ha), while 12% was still reserved for restitution (MERL, 2010).

As in many countries in transition, fragmentation of estates and lack of forest management skills by owners, aggravated by a lack of institutional capital on the side of the state, are commonly regarded as key issues hampering sound development of private forestry. Rigidly regulated state enterprises constituted the backbone of forestry during the era of planned economy, whilst private forest property was banned. The forestry authorities of the new independent Lithuania not only lacked experience of dealing with private owners; the owners *per se* were regarded with great suspicion, as a potential threat to the forests (e.g. Vasiliauskas, 1999). In the turmoil of the mid-1990s, this suspicion was in part justified by increasing timber thefts and fraudulent activities by some of the new "forest businessmen" who bought up estates or stumpage aiming for quick cash and sometimes violated legal norms (Verbyla, 2003). However, the main obstacle to successful transition to a private ownership regime has presumably been the professional ideology, since private property was not part of the value system after almost six decades of Soviet rule. In support of this assertion, Brukas et al. (2011) provide evidence of a lasting myth of overuse in private forests, although the harvest/increment ratios over the decade from 1998-2007 were less than 70%, and almost identical in state and private forests.

In this context, unsurprisingly, the authorities took precautionary measures and applied strict regulation. The Lithuanian Forest Law (1994, 2001), Regulations for Management and Use of Private Forests (1997), Regulations of Forest Management Planning (2003) and more than a dozen other legislative acts provide detailed prescriptions for forest management activities, such as: mandatory forest regeneration coupling certain soil types with permitted species and their densities; thinning regimes with strict limits of intensity, minimum allowable forest rotations, allowable cut, spatial restrictions, etc. Regarding environmental requirements, the key role is played by forestland zoning in so-called forest groups (Brukas et al., 2011). Each forest stand is assigned a status of strict reserve, protected, protective or commercial forest (currently covering 1.2%, 12%, 16% and 71%, respectively, of the total forest area). In terms of management aims, the Lithuanian forest groups quite closely resemble the Swedish functional forest classes; the major differences lie in the degree of coerciveness and spatial scale. In Lithuania, the forest groups are predefined at landscape scale for

all state and private forests. For an owner, it is a matter of luck whether his/her restituted forest happens to be protected (in which case no clear fellings are allowed and rotations must mimic the age of natural mortality of the species present) or commercial, with considerably larger scope for forest management decisions.

FMPs operationalize the legal stipulations into forest management prescriptions at the holding level. As a required precondition for carrying out final felling on any estate, the relevant FMP must follow the division into functional groups and various management regulations. To ensure they have adequate quality, FMPs must be prepared by certified planners with appropriate forestry education. Further, each FMP must be approved by environmental inspectors based in the regional environmental protection agencies and by the Lithuanian Forest Inventory and Management Institute. In addition to approving FMPs, inspectors issue cutting permissions, which are required for final fellings and commercial thinnings.

Forest management regulations (MERL, 2003) stipulate that contents of an FMP for a private estate must include a brief explanatory text about the estate, inventory tables, suggested management activities, management restrictions and cartographic material. A standard Lithuanian FMP resembles a Swedish FMP, i.e. the predecessor of GFMPs, with a clear focus on timber production. The main difference lies in the strong regulatory profile of the Lithuanian FMP, which is partly explicit (in stipulating allowable cut) and partly implicit (providing a considerably narrower space for management decisions). A Lithuanian FMP is valid for 10 to 20 years and it cannot, in practice, be replaced by a new FMP within the validity period.

In summary, forest planning and management tenets formulated for state forestry during the Soviet era were normatively transferred to private forestry in the independent Lithuania, with reinforced environmental stipulations. Little regard has been given to the scale of private holdings, or owners' needs and capacities. The focus lies in preventing undesirable management practices. To this end, the FMPs play an important regulatory role as a kind of precautionary leverage. Owners do not face any sanctions for not managing their forests. However, if an owner happens to have a legally mature stand and wishes to carry out final felling, she/he must acquire an FMP. As a result, the FMP almost exclusively functions as required, but insufficient, permission for final fellings. Today, valid FMPs cover 28% of the total area of private forests in the country and the average size of estates under FMPs is 6.8 ha (SFS, 2010). The statistics reveals that FMPs are primarily prepared for commercial and protective private forests (83% and 14%, respectively), while protected forests make up just 3% of the forest area under FMP.

5. Planning procedure

5.1 Preparatory phase

The main activities during the preparatory phase are gathering information about the estate concerned, making initial contact with the owner and preparing material to be used during fieldwork. In *Sweden*, an interested forest owner orders a GFMP via contracting routines of the SFA or Södra. The room for price negotiations is limited as both organisations use standardised pricing, including a fixed price per plan plus variable price per hectare. Having received an order planner initially screens the cartographic material and previous FMP, if available. Having easy access to centralized databases, he extracts GIS data on nature reserves, woodland key habitats, and cultural monuments. This is

typically followed by a 10 to 30 minutes phone call to the owner, in order to clarify the estate's accessibility, recent or ongoing forestry activities, and any changes in land use or estate boundaries. The approach adopted to clarify the owner's objectives varies substantially. Some planners strive to determine the owners' priorities, including, *inter alia*: short- and long-term economic requirements; desired trade-offs between economic and environmental values; aesthetic and recreational aspects. Others pay little attention to the owner's preferences, because, the respondents claim, of time pressure and/or the owner's inability to express his/her objectives. Planners with over 10 years experience have good knowledge of forests in their districts (typically within a radius of 50 km) and frequently know the estate owners and key features of their estates. After the initial screening, the relevant estate information is imported into hand-held PCs that are used in fieldwork by most SFA and Södra planners.

As most *Lithuanian* forest management planners work independently, the interested landowners directly contact prospective planners by telephone, usually following recommendations by environmental inspectors. This is one of the reasons why planners tend to work only in regions where they have well established connections with inspectors (see also Section 5.3.2), sometimes over 150 km away from their place of residence.

The conversations between Lithuanian owners and planners typically start with price negotiations. Planners always enquire whether the estate contains any old stands that may have reached allowable rotations, since otherwise "*preparation of an FMP does not make sense*". Most planners also ask whether estate boundaries are clearly marked.

State forest inventories are carried out periodically in all Lithuanian forests, but planners do not have direct access to the collected data. Cartographic material and the inventory data are only available for purchase from the Lithuanian Forest Inventory and Management Institute. Planners claim that the defined official rates of 10-15 euro per estate are too expensive. This leads to a thriving black market, as most planners purchase the materials illegally from "accessible" employees of the institute. The data of the state forest inventory is used by planners for initial orientation and pre-assessment of forest resources on the estate, but their quality is insufficient for detailed planning as required for private estates.

5.2 Fieldwork

With the help of a map, and initial inspection from car, a *Swedish* planner determines an efficient route through the estate. He then commences forest measurements, with a degree of detail depending on the stand age and structure as well as planner's routines. Stands up to 20 years old are only evaluated visually from outside, judging the need for precommercial thinnings. For older forests, planners measure the basal area of stand and instrumentally or visually estimate the diameter and height of representative trees. Boring trees for estimating age is the most laborious procedure, thus if an old FMP is available it is usually avoided. Stand boundaries are checked along the route, and when necessary they are revised with the help of GPS. In addition to these elements of a "classical" timber inventory, the Swedish planners take note of the green values in each stand, in order to define functional forest class and comply with other certification requirements, such as delineating protected forest edges or creating required proportions of broadleaved trees.

A frequent, significant complication for fieldwork in *Lithuania* is the absence of clearly visible estate boundaries. Although forest owners are legally obliged to mark the boundaries of their estates using underbrushing, corner poles and axe markings, the interviewed planners estimate that this is properly done in only 10-15% of cases. When marking has been done very poorly, or neglected, some planners may mark the boundaries themselves for extra payment (for up to 150 euro per estate), while others may refuse to prepare an FMP. The methods used in their forest inventories *per se* are quite similar to the Swedish methods, although Lithuanian planners rely more heavily on visual estimations than instrumental measurements when collecting tree height, diameter and basal area estimates. On the other hand, Lithuanian planners put more effort into defining exact stand boundaries and measuring ages of trees in stands approaching allowable rotation ages, as these parameters are most pedantically checked by environmental inspectors. As a respondent explains, "*If the state inventory data indicates that a spruce stand is 60 years old, but I find it to be 70, it is a "scary" stand. I bore trees again and again, until I am convinced [that my estimate is accurate]. I derive an average age, when ages of bored trees differ*". Some planners even state that they avoid preparing FMPs for estates with stands that are approaching their allowable rotation age, since much more demanding measurements are required in such cases, and the risk of environmental inspectors disagreeing with their assessments and imposing sanctions cannot be eliminated. In contrast to their Swedish counterparts, Lithuanian planners do not explicitly evaluate environmental features, as this is not required and the environmental restrictions are framed in advance. Nevertheless, the interviewed Lithuanian planners still spend seven times more time per ha on fieldwork than their Swedish counterparts. This can be explained by a combination of several factors, including more complex forest structures, less technologically advanced equipment, more meticulous checking of stand boundaries and tree ages, and longer driving distances to smaller estates.

Concerning contact with owners, most interviewed planners consider the presence of the owner to be a distraction, which sometimes even necessitates remeasurements. As a Swedish planner puts it: *"[…] the worst case is when the owner is with me in the forest; it adds at least 30% extra time, one forgets figures, etc. This happens once or twice per year*". Some Swedish respondents avoid any contact with owners during their field visits, while others allow an optional, short socializing meeting before or immediately after the inventory, or even permit the owner to accompany them in the forest for a few hours. Only one of 12 interviewed Swedish planners claimed that he welcomes the owner accompanying him during forest visits, that the owner's presence does not have any disadvantages, and that the owner can benefit from his immediate impressions about possible forest management options. Similarly, only two out of 10 Lithuanian planners said they try to persuade the owner to accompany them when visiting the forest, resulting in their presence on about 50% of occasions. For remaining planners, the owner is on average present on less than 10% of cases.

5.3 The final phase

5.3.1 Sweden

The final phase comprises: (i) elaboration of the plan, including analysis of inventory data, producing maps, and packaging material into a user-friendly format and (ii) contact with the owner, which may range from merely handing over the completed GFMP to a thorough discussion of proposed forest management activities. The technical/analytical work varies in the degree to which planners use services of the specialised planning offices. Some planners do all or most of the technical work

themselves, spending on average 6.5 hours. Others leave map digitalization and packaging of the material to the central office, halving the working time to 3.5 hours.

The contact with owners strikingly varies among Swedish planners. Judging by the reported contact time and interviewees' attitudes, they can be split into two halves: "advisory planners" and "non-advisory planners", the former being eight years older, on average, than the latter. Non-advisory planners averagely spend 15 minutes per GFMP, the conversation often being limited to settling formalities by phone. A typical approach by this group is to post a draft GFMP to the owner, giving an option for comments, if the owner wishes. The great majority (some 90%) of owners do not make any comments and quite often there is no conversation, either in person or by telephone. Asked to evaluate such an approach, most informants see great value in discussions with the owner, but cite the time pressure as the key reason for the limited contact. One planner confesses: "*Previously I always met the owner, before the final version of the GFMP was produced. But we found that this takes a lot of time (about an hour), even though it was highly appreciated by the owner. […] Now I spend on average 10 minutes per GFMP in conversation with the owner by phone. This was decided in consultation with our district head who wondered how we could speed up some processes*". Non-advisory planners at Södra also argue that planners can keep a low profile since their colleagues in charge of timber procurement transmit the contents of plans to owners. Some interviewees at SFA assert that active consultancy for owners appears to be inappropriate when they are contracted to produce plans via external organisations (such as forest owner associations) as a state agency should rather not interfere in procurement activities of the contracting organisation.

In contrast, the advisory planners spend on average 2 hours going through plans with the owners. They proactively seek personal contact and typically address: (i) links between spatial GFMP elements with actual features on the estate to facilitate the owner's orientation; (ii) nature protection measures, focusing on the forest zoning into functional classes; and (iii) forestry measures, including final fellings and thinnings, taking into account the owner's age, financial situation, etc. Advisory planners believe a thorough discussion is valuable for several reasons. First, elaboration of a GFMP provides the planner with sound knowledge of the estate, and hence unique advisory capacity. Second, the owners' knowledge of their estates and forestry skills are generally declining, and a personal interactive review of a GFMP allows management priorities to be clarified. As a planner puts it: "*When you explain things to the owner, he understands!"* Third, advisory planners argue that they have an important representative role for their organisations, which is essential for nurturing successful long-term relationships with the owners, in promoting state policy implementation (for the SFA), or securing timber procurement contracts (for Södra). Particularly for the latter, the advisory planners claim that procurers cannot provide guidance of the same quality as planners. Procurers have less knowledge of the estate, work under higher time pressures and inherently focus on timber procurement, paying little attention to other issues, such as the need for pre-commercial thinnings.

5.3.2 Lithuania

In contrast to their Swedish counterparts, the Lithuanian planners are not equipped with field PCs and need to elaborate FMPs completely on their own. Therefore, unsurprisingly, they spend more time (almost 7 hours per FMP) on the technical/analytical work, although the estates they assess are

small. The contact with owners takes only 30 minutes, on average (Table 3), and in many cases is confined to settling payment and handing over an FMP.

Table 3. Duration of the three phases of preparing FMP and owner contact in Sweden and Lithuania

	Average	Total time by phase, h				T/ha	contact with owner, h				
	estate, ha	prep.	field	after	total		prep.	field	after	total	Approval
Sweden SFA	49	2.2	12.4	3.8	18.4	0.4	0.5	0.5	0.7	1.7	0
Sweden Södra	76	2.4	19.3	6.9	28.6	0.4	0.2	0.2	1.4	1.8	0
Lithuania	7	2.7	7.2	6.8	16.7	2.8	0.4	1.7	0.5	2.6	3.4

Compared to the Swedish case, the major difference is the requirement to approve FMPs by environmental inspectors. Most planners normally deliver draft FMPs personally to inspectors in their regional offices. By law, the inspector should make decision within 10 days if a plan is approved. When checking FMPs in the office and on site (the latter conducted in about 50% of cases), inspectors primarily pay attention to the species composition, age and boundaries of stands. Three types of sanction may apply in cases of deviations from established requirements. The most severe sanction - cancellation of the planner's license - is only applied in exceptional cases. On rare occasions (up to four times in the careers of interviewees) the planners have to pay fines ranging from 60 to 120 euro, roughly corresponding to half the fee for an FMP. The mildest sanction is a requirement to correct FMPs. Most interviewed planners need to make corrections in just 1-2% of submitted plans, but one reports the share of about 50%.

This variation can be at least partly explained by differences in the strategies planners adopt when approaching inspectors. Most planners try to establish and maintain "good connections" with inspectors in various informal ways, such as periodically enclosing some cash, giving "presents" in the form of bottles, paying for "friendly lunches", etc. A prolific planner, among the top five nationally in terms of the number of prepared FMPs, admits: "*You bring the project, they take and sign it; you leave money from time to time, or sometimes a small bottle. After all, these inspectors give my phone number to owners. […] I may leave a couple of hundred litas [up to 100 euro] for some 5-6 projects. Time is money*". On the other hand, he also notes that there are some inspectors who categorically refuse to take money.

The planner, who only gave a bribe on one "unbearable occasion", is the one who reported the 50% rate of demanded corrections, on average prolonging the time of FMP preparation by a full working day. He regards that in about half of cases the demands are pure formalities. For example, there may be a requirement to move stand boundaries by some 20 meters, although boundaries are subject to personal interpretation, and determining them with such precision would often be too costly or even impossible, given the instruments used in a conventional forest inventory.

Planners believe that inspectors' behaviour is strongly influenced by low salaries and the institutional set-up, key tenets of which are meticulous control and sanctions. Inspectors themselves face frequent internal controls and some years ago they even had to fulfil official quotas for collecting a certain minimum number of fines. They are still unofficially encouraged to do so, and planners feel that inspectors' decisions may be inconsistent, partly (probably) because they are influenced by their

control schedules. However, the worst cases involve inspectors who illegally engage in mediation for forestland trade, leading to conflicts of interests and sometimes fraudulent control. According to respondents, such corruption is difficult to identify, but they believe that the number of "inspector-traders" is declining. In any case, the interviews reveal substantial costs of control as the approval process absorbs circa 20% of the time spent for preparing an FMP.

6. FMPs as policy instruments – a critical assessment

Interviews in both countries were concluded by assessing the instrumental dimensions of FMPs as policy tools, following Vedung's (1998) classification. The planners were requested to assess the relative importance of regulative, economic and informational instrumentation, assuming that the combined instrumental role of FMPs adds to 100% in respective country (Fig. 1). Planners' perceptions varied substantially and the samples are too small to draw robust statistical inferences. However, their responses reinforce the impression obtained from the preceding analysis: the regulatory dimension is strongly dominant in Lithuania, while the informational dimension prevails in Sweden. The results indicate that, firstly, FMPs are composite instruments that cannot be simply assigned to any specific archetypical policy instrument class. Secondly, thorough scrutiny of the institutional context and planning routines is needed to grasp the actual policy instrumentation. The comparative analysis discloses notable differences in technological aspects, such as the use of hand-held PCs and anticipated large-scale applications of laser scanning in Sweden, but not Lithuania. Such technological innovations can generate cost savings and/or increase the accuracy of inventories. However, the most fundamental differences is in the policy instrumentation of forest management planning, which shapes planners' interests, steers owners' motivation and, ultimately, leads to substantially different procedural practices.

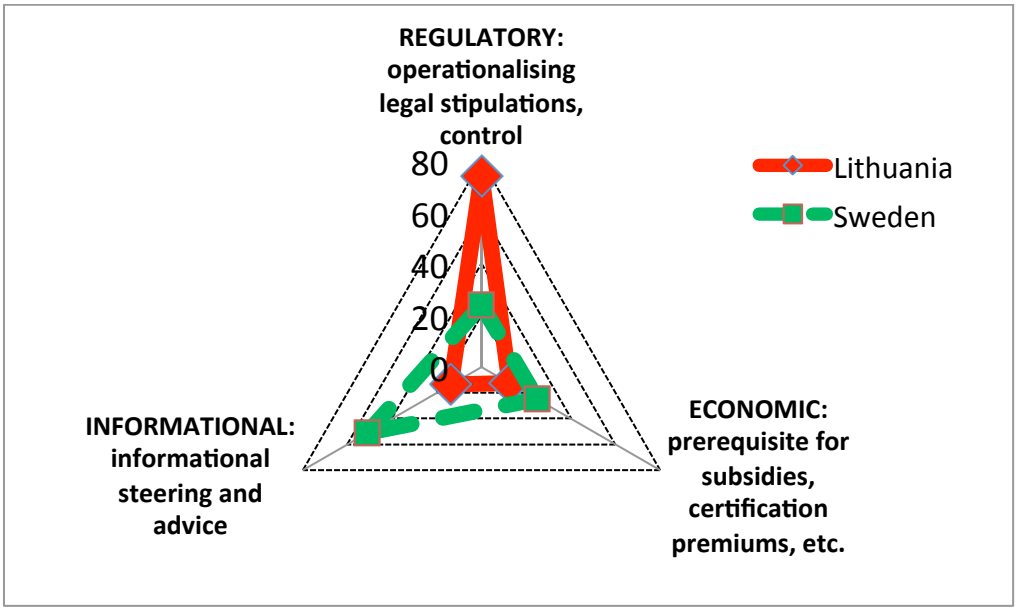

Fig. 1. Planners' perceptions of FMPs as policy instruments.

Regarding the relationship between the state and forest owner, the informational potential of FMPs can be realized in two major ways, as they may be used both as a means to transfer the prevailing management paradigm to the owners, with emphasis on the state's "needs", and as decision support

tools, with emphasis on owners' needs. The first function prevails in Sweden, as the implementing organisations analysed in this study give low priority to advisory service within planning. The contact with owners is left to the planner's discretion, while organizational pressure to raise productivity marginalizes the advisory role. Further, correlations between our interviewees' responses and their ages (Fig. 2) indicate that the time spent in contact with owners, and thus the importance of the counselling role, is diminishing. The older, advisory group of interviewed planners may embody a somewhat idealistic rooting in the long-standing national tradition of forestry advisory services, while the younger, non-advisory group has pragmatically adapted to current organisational realities, seeing consultancy as a costly measure that is outside their direct remit.

This shift in practices seems highly unlikely to be part of a deliberate strategy devised by the leadership of SFA and Södra. We rather suppose it to be an unintended outcome of the combined effects of several factors, such as insufficient consideration of the consequences of the organisations' quest for efficiency, vague definitions of the advisory roles of planners and timber procurers, and overly technologically-focused on-the-job training of the planners in early stages of their careers. We find the outcome to be unfortunate for at least two reasons. First, contact with the owners accounts, on average, for just 6% of the total time that our Swedish interviewees spend preparing a GFMP (10% for the advisory group) and there is no correlation between the duration of the contact and a planner's total time input for a GFMP (Fig. 3). Thus, reducing the duration of contact with owners is a doubtful strategy for reducing costs. Second, and more importantly, the contact with owners represents a valuable use of time in many respects, as shown by the experience of the advisory planners, since it can improve both the transfer of the management paradigm and the accommodation of forest owners' needs.

Similar situation has been revealed in Finland (Hokajärvi et al. 2009), where the established planning framework and focus on efficiency (in terms of hectares per planner) inhibit the development of advisory planning as effective means for activating forest owners. The Finnish planners regard the advisory function to be very important but feel that they lack opportunity to respond to owner's needs.09järvi et al. (2010) recommend that forest management planning would more clearly separate the forest as inventory object and forest owner as the client. Raising the status of owner's needs and motivations should serve as a point of departure for developing a genuine customer-oriented planning. We believe that these recommendations apply equally well to Sweden.

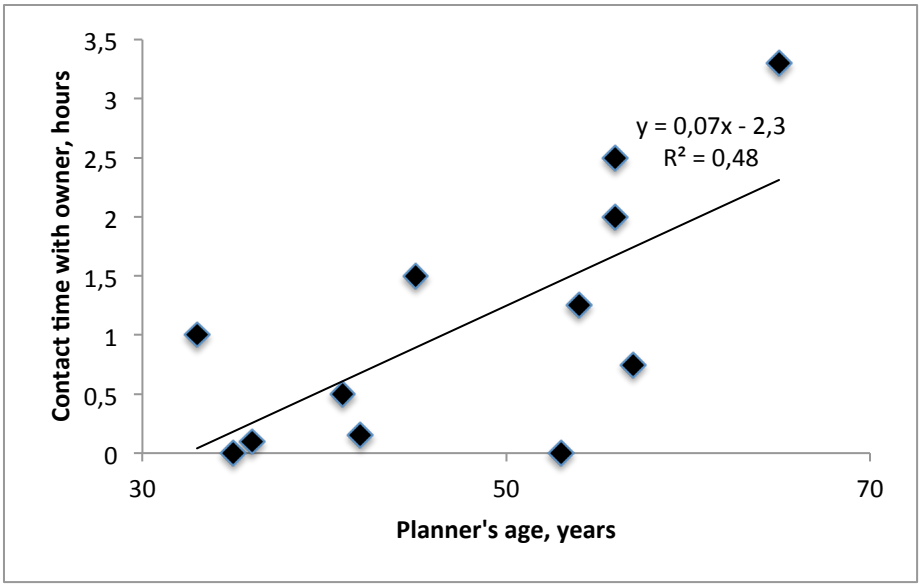

Fig. 2. Planner's age versus contact time with the owner during the final phase of FMP preparation in Sweden**.**

Subtleties of informational FMP instrumentation are of little relevance in Lithuania, where forest policy towards private owners is rooted in the command-and-control tradition and FMPs constitute an important link in the regulatory chain. Here, the regulatory orientation, with little provision for support, forms a favourable substrate for *corruption*, starting with the illegal purchase of state inventory materials and ending with bribes to facilitate the approval of plans. While instances of corruption can be considered mild, relative to the overall extent of "bureaucratic crime" in Lithuania, they still create undesirable inefficiencies. Notably, tandems of planners and inspectors "with good connections" restrain fair competition; informants admitted that it is very difficult for newly qualified planners to enter the market under these conditions, and even experienced planners are very unwilling to prepare FMPs in districts where they lack established connections.

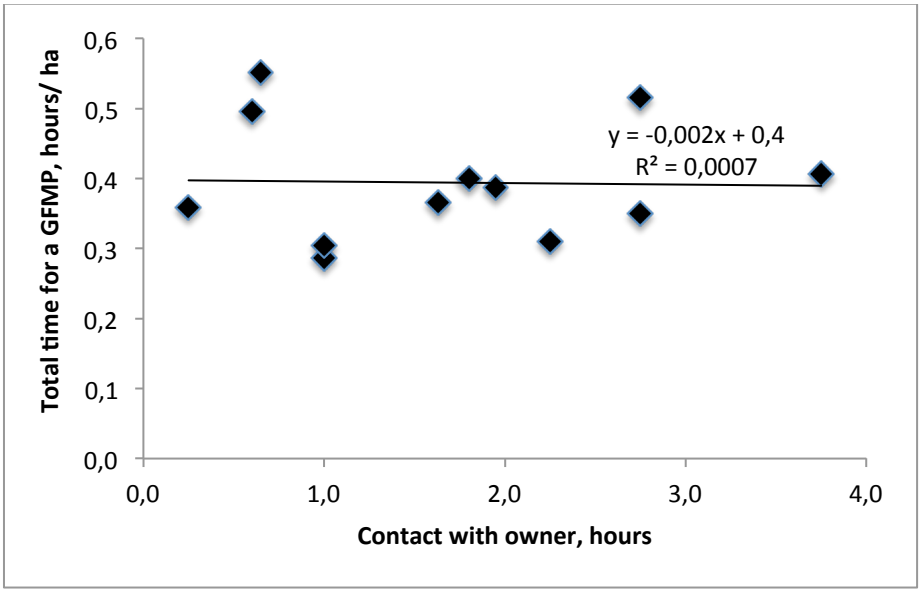

Fig. 3. Duration of Swedish planners' contact with owners versus the total time input per GFMP

The instances of bribery, long driving distances to districts under the aegis of well-disposed inspectors, and the potential obstacles in approval routines all add significantly to the *costs* of FMPs. Although salaries are considerably lower in Lithuania, the FMP price per ha (in euro) for an average estate is 1.2 times higher than in Sweden, and 2.3 times higher after adjusting by purchasing power parities (Eurostat, 2011).

Our interviews revealed signs of *dissatisfaction* with their work among Lithuanian respondents, primarily due to the perceived overregulation. While most planners felt that the planning system largely functions smoothly, in terms of meeting the intended aims, many questioned the overall purpose of detailed steering, and some were bluntly disillusioned. A planner who started his career over a decade ago with hopes of doing a meaningful job for the benefit of forest owners, summarises his general impression as follows: "*Punishment, punishment – this is encoded in the law. As for incentives, there are none. I see such a dreadful picture, working in this system. I made some money and that is all*".

Concerning management of private forests, large proportions of Lithuanian forest owners are passive and lack knowledge of both forestry and the associated bureaucratic routines. The regulatory maze that has to be negotiated in order to acquire and follow FMPs has further aggravating effects on *owners' motivation*. The requirement for an FMP appears to be particularly onerous for small estates. Most interviewed planners found it ridiculous that estates covering up to 3-5 ha need an FMP to carry out final fellings, especially as cutting permission is required in any case. The requirement for an FMP was dropped for estates smaller than 3 ha at the beginning of 2011. This could be a sign of emerging, and much-needed, softening of regulation through planning.

7. Concluding remarks: the fusion of planning and policy analysis

Planning scholarship increasingly recognises the need to incorporate policy theories and methods, notably analysis of policy tools can facilitate explorations of intertwined technical and political dimensions of planning frameworks (Ponzini, 2008). Thus, it can help in getting a better grip of the purpose, i.e. the true value of a particular planning endeavour and how it performs in practice in relation to the purpose. Policy analyses, on the other hand, underutilise its capacity for explaining complex social phenomena (Flyvberg, 2001). Planning practices thus constitute a promising arena for contextualised social research. However, few studies to date have examined the policy instrumentation of natural resource planning empirically, beyond deductive theorising.

We accepted the challenge of grounding our analysis by scrutinising the routines and perceptions of forest management planners in Sweden and Lithuania. The exercise proved to be worth the effort, not only enabling us to set planning properly into policy contexts, but also yielding valuable insights into implementational realities, such as the variation in planners' contact time with owners in Sweden. Forest management planning encompasses much more than the sum of technological operations involved in carrying out a forest inventory and preparing an FMP. However trivial it may sound, such revelation demonstrates that further research on the interface between forest policy and planning is warranted.

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References

Ananda, J. and Herath, G. 2009. A critical review of multi-criteria decision making methods with special reference to forest management and planning. Ecological Economics 68: 2535–2548.

Baskent, E.Z., Keles, S. 2005. Spatial forest planning: A review. Ecological Modelling 188 (2-4): 145-173.

Brukas, V., Kuliešis, A., Sallnäs, O., Linkevičius, E. 2011. Resource availability, planning rigidity and realpolitik in Lithuanian forest utilization. Natural Resource Forum 35 (2): 77-88.

Bush, T. 2010. Biodiversity and sectoral responsibility in the development of Swedish forestry policy, 1988-1993. Scandinavian Journal of History 35 (4): 471-498.

Cook, M., Young, A., Taylor, D., O'Shea, A., Chitashvili, M., Lepeska, V., Chomentauskas, G., Ventskovsky, O., Hermochova, S., Uhlar, P. 1998. Personality profiles of managers in former Soviet countries: Problem and remedy. Journal of Managerial Psychology 13 (8): 567 – 579.

Diaz-Balteiro L., Romero, C. 2008. Making forestry decisions with multiple criteria: A review and an assessment. Forest Ecology and Management 255 (8-9): 3222-3241.

Ekelund, H., Hamilton, G. 2001. Skogspolitisk Historia. [History of Forest Policy] Rapport 2001:8A. Skogsstyrelsen, Jönköping, 264 pp. (In Swedish)

Eurostat 2010. GDP per inhabitant in purchasing power standards. Eurostat news release 195, 15 December 2010.

Eurostat 2011. Comparative price levels. Hyperlink: http://epp.eurostat.ec.europa.eu/tgm/table.do?tab=table&init=1&plugin=1&language=en&pcode=tsier010 (Accessed on June 24, 2011).

Flyvberg, B. 2001. Making Social Science Matter: Why Social Inquiry Fails and How it Can Succeed Again. Cambridge University Press, Cambridge, 216 pp.

FSC (Forest Stewardship Council) 2010. Swedish FSC Standard for Forest Certification including SLIMF indicators, V2-1 050510, FSC, Sweden.

Hokajarvi, R., Hujala, T., Leskinen, L.A., Tikkanen, J. 2009. Effectiveness of sermon policy instruments: forest management planning practices applying the activity theory approach. Silva Fennica 43 (5): 889-906.

Hood, C. 1983. The Tools of Government. Macmillan, London.

Hujala, T., Tikkanen, J., Hanninen, H. and Virkkula, O. 2009. Family forest owners' perception of decision support. Scandinavian Journal of Forest Research 24 (5): 448-460.

Ingemarson, F., Jansson, V., Malmhäll, J., Merkell, B., Nasic, S., Svensson, S.A. 2007. Hur drabbades enskilda skogsägare av stormen Gudrun? Resultat av en enkätundersökning [How were private forest owners affected by the Gudrun storm? Results of representative survey]. Skogsstyrelsens förlag, Jönköping, 69 pp. (in Swedish)

Lascoumes, P., Le Gales, P. 2007. Introduction: understanding public policy through its instruments—from the nature of instruments to the sociology of public policy instrumentation. Governance 20 (1): 1-20.

Lutz, D.A., Washington-Allen, R.A., Shugart, H.H. 2008. Remote sensing of boreal forest biophysical and inventory parameters: a review. Canadian Journal of Remote Sensing 34 (Supplement 2): 286-313.

Maciejewski, W. (Ed.) 2002. The Baltic Sea Region - Cultures, Politics, Societies. Baltic University Press, Uppsala, 676 pp.

Martins, H., Borges, J.G. 2007. Addressing collaborative planning methods and tools in forest management. Forest Ecology and Management. 248 (1-2): 107-118.

MERL (Ministry of Environment of the Republic of Lithuania) 2003. Dėl Lietuvos Miškotvarkos Taisyklių Patvirtinimo

[Lithuanian Regulations of Forest Management Planning]. Order by the Minister of Environment, Vilnius. (in Lithuanian)

MERL (Ministry of Environment of the Republic of Lithuania) 2010. Lithuanian Statistical Yearbook of Forestry 2010, Ministry of Environment, State Forest Service, Kaunas.

Miles, M.B., Huberman, A.M. 1994. Qualitative data analysis. An expanded sourcebook. Second edition. Sage publications, Thousand Oaks, London, New Delhi.

Mårtensson, M., Söderström, T., Johansson, T., Persson, A., Spross, R. 2003. SVO:s Framtida Planverksamhet – en Förstudie. [National Forest Agency's Future Planning Activities – a Pilot Study]. National Forest Agency, Department of Forest Service, Jönköping. (in Swedish)

Ponzini, D. 2008. New Italian perspectives on urban planning: A policy tool approach. Planum, December, pp. 1-31

Salamon, L.M. (Ed.) 2002. The Tools of Government: A Guide to the New Governance. Oxford University Press, New York, 669 pp.

Serbruyns, I. and Luyssaert, S. 2006. Acceptance of sticks, carrots and sermons as policy instruments for directing private forest management. Forest Policy and Economics 9: 285– 296.

SFS (State Forest Service) 2010. Privačių Miškų 2000-2009 Metų Individualių Miškotvarkos Projektų Sąvadas [Register of Forest Management Plans for Private Estates in 2000-2009]. Kaunas. (in Lithuanian)

Skogsstyrelsen, 1983. Skogsstyrelsens Författningssamling 1983:427 [Swedish Forest Agency's Collection of Legislation]. Skogsstyrelsens förlag, Jönköping. (in Swedish)

Swedish Forest Agency 2010. Swedish Statistical Yearbook of Forestry 2010. Jönköping.

Vasiliauskas, V. 1999. Neramios Miško Dienos. Miškų Valdymo Politiniai Aspektai [Unsettling days in forest. Political aspects of forest administration]. Aušra, Kaunas. (in Lithuanian)

Vedung, E. 1998. Policy instruments: typologies and theories. In: Bemelmans-Videc, M.L., Rist, R.C., Vedung, E. (Eds.), Carrots, sticks and sermons. Policy Instruments and Their Evaluation. Transaction publishers, New Brunswick, New Jersey. pp. 21-58.

Verbyla, V. 2003. Apsauga nuo savavališkų miško kirtimų. [Protection from illegal logging]. In: Kairiūkštis, L. (Ed.), Lietuvos Miškų Metraštis XX a. Aplinkos ministerija, Vilnius, pp. 274-277 (in Lithuanian, with English abstract)

World Bank Group 2010. Global governance indicators (hyperlink: http://info.worldbank.org/governance/wgi/index.asp, accessed on May 15, 2011).