



The roles of experts in forest-related participatory processes in Europe - A literature review

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Abstract

Demands for participatory processes in forest related decision-making have grown with the shift from government to new modes of governance. However, conflicts between participants occur due to that they hold different interests and expertise. There is uncertainty about the value and function of experts in participatory processes. There exist many studies of case studies of different participatory processes but few have had a focus on the role of experts in forest-related participatory processes. Thus, the aim of this study is to investigate the role of experts in forest-related participatory processes in Europe and explore what influence they bring into the phases of policy formulation and management planning. This study presents a systematic literature review of 30 articles published during year 2006-2018. Results indicate that experts' values and functions are: Provision of knowledge-base; Supportive attitude towards participatory decision-making; Identified roles as facilitator, organiser and observer; Contribution of social contacts and network. Governmental experts from the top of the hierarchy are evident because the stage of policy formation focus on a future envision. And, in the management planning phase, experts primarily are requested to cooperate with local authority and professionals. Moreover, administratively based experts and scientists are the most identified types of experts. Especially, researchers are frequently recognised as facilitators when participatory processes are assisted by decision-support tools. Expert-facilitator play the multifunctional role to sort technical problems, advise in complex debates and bridge the relations among participants. During the coding process, the textual interpretation of identifying experts was time consuming due to inadequate explanation and description of the role. The suggestion for future research is a more detailed elaboration of the roles will result a better later analysis.

Key words: forestry, public participation, expertise

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1. Introduction

New modes of governance aim to seek collaborative ways for solving social problems and emphasizes the interaction between state, market and society, e.g., accelerate the collaboration between public and private actors. Certain concepts that builds “governance” are: rules and qualities of system; co-operation to enhance legitimacy and effectiveness; arrangements and methods; new processes. The development of governance in the forestry sector has followed this trend (Kooiman, 1999).

Since early 1980's, the shift from state regulation-government has gradually changed to new modes of governance. New modes of forest governance has influenced associated discourses, institutions and actors from local to international scales. Before shifting to new governance, the “command-and-control” forest management systems were directed from hierarchical approaches by national states. Such top-down mechanism, gave rise to problems of miscommunication and misunderstanding. Another reason for motivating the shift is due to unsustainable management practices applied to vulnerable ecosystems. Therefore, the market-based, self-regulatory and voluntary measures have been introduced to replace the old government notion. New modes of governance has focused more on social networks and partnerships, namely, some responsibilities for policy implementation have switched to private sector (Arts et al., 2010, Glück et al., 2006, Kooiman, 1999).

Participation is about finding consensus in diversity and helps to create more informed operative decisions as well as increase the legitimacy by involving social actors. Thereby, participatory process provides a more solid and democratic base for policy outputs (Appelstrand, 2002). Additionally, participatory processes offer a possibility to integrate wider interests, values and perspectives into management and planning processes (Appelstrand, 2012, Sandström et al., 2011, Wallin, 2016).

New modes of governance counteract former deficits to achieve better legitimacy and effectiveness. Effectiveness can refer to the effective governance to achieve policy goals or the efficiency of addressing issues. Democratic legitimacy refers to the perceived legitimacy of the decision-making process and final decision (Bäckstrand et al., 2010).

Debates emerge when it comes to the concerns if participation and new governance can actually increase effectiveness and legitimacy in policy making processes. There still exist obstacles under the new governance, e.g., unequal power distribution and inefficient administrative arrangement. And it also challenges present structure of forest sector, e.g., question about property rights, and call for adaptation of educational measures (Wallin, 2017).

To serve the principle of new governance, expertise is brought in by more democratic procedures. And from normative expectations of governance perspective is to formulate more effective policies by integrating expertise in processes (Kleinschmit et al., 2009). Experts mostly aid in forest-related land-use planning or act as advisors in policy making processes. In practice, land managers and owners often need the support from various

experts (e.g., administratively based-expert, forestry professional, ENGOs, scientist, industry and local knowledge) (Janse and Konijnendijk, 2007, Primdahl et al., 2018).

There are however doubts whether experts support participatory processes in a positive way or not. (Shannon, M.A. et al. 2007) explains that scientists are often used as alibis for politicians, stakeholders or bureaucrats to justify their arguments by drawing upon the positive image of science. Governmental authorities are usually not willing to relinquish their power and use science to stay in control.

Furthermore, uneven expertise distribution and insufficient knowledge resources ultimately change power relationships (Buchy and Hoverman, 2000). It is argued to take into account local demands. This viewpoint, refers to what (Mårald et al., 2015) call “a dynamic science-stakeholder exchange”, the linkage of other expertise-networks (e.g. lay knowledge, societal actors) would not only increase social acceptance but also keep knowledge resources flowing.

There is an uncertainty about the values and functions of experts and there is a need to analyse the role of experts and expertise in participatory processes. Despite many studies carried out about participation, there is yet no study that has synthesised the findings from the many studies focusing on forest-related participatory processes. Accordingly, the aim of this study is to investigate the role of experts in forest-related participatory processes in Europe and explore what influence they bring into the phases of policy formulation and management planning. This study is a systematic literature review of peer-reviewed articles containing case studies describing different forest-related participatory processes. The following research questions were asked:

1. How do experts participate in the phase of policy-formulation and the phase of management planning respectively?
2. How do experts take part in the participatory process?
3. What types of experts are evident in the reviewed articles?

2. Theoretical underpinnings

2.1 The role of experts and expertise in participatory processes in theory and in practice

A sociological conception of knowledge refers not only to the social basis of knowledge but rather to the function that knowledge perform in social action (Stehr and Grundmann, 2011). (Grundmann, 2009) mentions the traditional view of knowledge in society is known as the linear model of knowledge production and application. According to this view, knowledge is first generated as basic research. Later, it becomes applied knowledge “expertise” which can solve specific problems in practice, e.g., through engineering devices or decision making in politics.

In a narrow definition, experts usually connect to occupations, or experts who act as mediators between science and politics. Usually they are themselves scientists or they are scientifically educated. Yet, in a broader definition, experts could be explained as knowledge-based occupations that serve all the strata of the population in society. In this sense, they are based on their routine contact with specific topic and they have accumulated experience in contexts relevant for taking action, for instance foresters have experience in cultivating trees. Experts know how particular knowledge can be mediated or sold (Stehr and Grundmann, 2011).

Scientific research is not purely objective and value free (Spruijt et al., 2016). Science has political value and forestry scientists are generally part of different policy communities. They react to the norms and conventions of their disciplines, as well as political incentives within their professional networks. These characteristics are readily observed as belonging to administratively based experts. The political issues are influenced by administrative mechanisms and it drives how scientists’ knowledge is introduced, communicated and delivered in participatory processes (Janse and Konijnendijk, 2007).

In new governance processes, a scientification of politics is simultaneously connected with a politicisation of science. It implies scientification of politics is expected to enhance democratic legitimacy, and, politicisation of science is that actors use expertise as instruments to support their political interests and power (Kleinschmit et al., 2009).

Scientists are part of social and cultural discourses, thereby, science is not objective. During participatory processes, scientists perceived what they do is not “science”, but a hybrid activity that combines elements of scientific evidences and political judgments, which is meant to apply to their roles as policy advisors (Grundmann, 2009). In expert-driven policy making processes, scientific knowledge is considered as an important factor to influence social and political interests. Forest scientists are called in as reinforcement to mediate the process, on occasion, they are given consultant roles. Ideally, their functions are to deliver scientific information and interpret scientific language to more accessible terminology. (Saarikoski et al., 2012, Kleinschmit et al., 2018).

Inclusion of different expertise is one of key characteristics of the new governance development, but the accountability of expertise is doubted. Participation of non-

governmental actors and expertise create alternatives as well as challenges for democracy in forest policy making. The position of scientific expertise has changed because other types of expertise (lay knowledge, citizens' science) have become increasingly involved (Kleinschmit et al., 2018).

With regard to the growing importance of scientific expertise in decision making processes, some problems have been pointed out, e.g., over-reliance on models, over-promoting of scientific results. Science may provide advice that is out of sync with the political plans and thus be dismissed. Moreover, science may not be sufficiently simple for the needs of policy maker. Although, the traditional concept of linear relation between knowledge and application is transforming with new governance, it is still influential in some fields where decision-making is depended upon great doses of scientific expertise (Grundmann, 2009).

2.2 Arnstein’s ladder

This study employs Arnstein’s ladder of citizen participation (Arnstein, 1969) to analyse the participatory processes of reviewed case studies, to distinguish the democratic degree (bottom-up to top-down). According to Arnstein’s Ladder (see figure 1), informing and consultation, counts as a first legitimate step in participatory approach. When participation is restricted to these levels, people’s voice may be heard before making decision, but it often goes one way of information flow. Techniques like public enquiries, attitude survey and neighbourhood meetings are common held in this stage to divulge knowledge about the decision rather than to seek opinions or to allow influence (Buchy, M.; Hoverman, S. 2000). Under these conditions, city residents lack the power to effect any further, consequently, there is no assurance of changing the status quo. And the rung of placation gives citizens an opportunity to advise or plan, however, power-holder still make the final decision. Gradually mmove to the top of ladder, more power is given to participants to negotiate what they require.

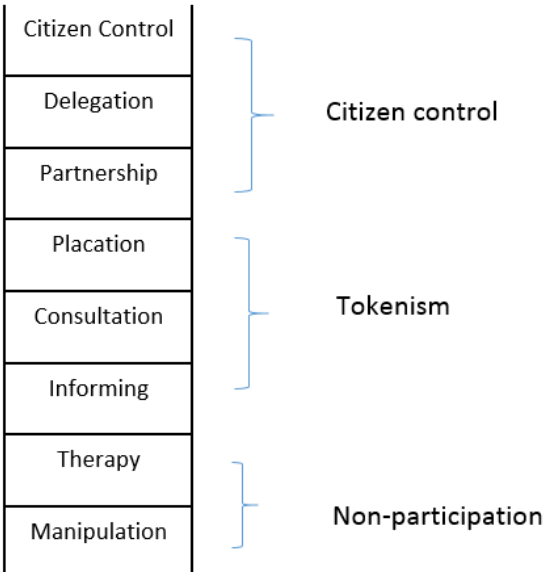


Figure 1 Arnstein’s ladder of citizen participation (Arnstein 1969)

3. Methodology and analytical steps

3.1 Systematic literature review

Systematic literature review is one kind of qualitative research. It aims to address research questions by identifying, integrating and critically evaluating the findings from reviewed studies (Baumeister and Leary, 1997). Compared to a normal literature review, the analytical strategy of systematic literature review is comprehensive. Systematic literature review contain not only a normal procedure of literature review but also carry out a secondary analysis, introducing a new framework of analysis.

Systematic literature review begins with inclusion and exclusion of articles based on criteria set before conducting the selection. Subsequently, data classification processes the initial selected articles into structural meta-data categories. In the later stage, content analysis is introduced to assist labelling and identifying the articles since there is no textual coding system when executing normal literature review (Berg, 2004). In this step, the analytical categories are created with themes in order to extract and analyse the texts more explicitly. Systematic literature review gives a better quality of interpretation and analysis, further, it summaries clearly in the evidence of data synthesis and results.

3.2 Data collection

3.2.1 Selection criteria

A systematic literature review of peer-reviewed articles was initially conducted. Selection criteria were created into three categories of search terms, so as to increase the precision while screening numbers of articles. And, as well to reduce the opportunity to exclude any valuable article, namely, some similar terms might be defined differently by authors. The three selection criteria-categories of search terms are: 1. Forest (forestry, woodland) 2. Participatory processes (participation, community-based forestry management, participatory, collaborative forest management, co-governance) 3. Expert (professional, consultant, scientist, specialist, researcher), see figure 2.

3.2.2 Primary selection

First identification of relevant articles was conducted by crossing 3 selection criteria-categories via the database Scopus. Each scanning section merged one word or one term from each selection criteria-category in sequence, e.g., the combination of forest, participation and professional (see figure 2). The reason to choose Scopus as database was due to it contains more journals, particularly newer and smaller ones (Arts, 2012). The search-time period was set to be unlimited for the purpose of attaining the best optimal inclusion, therefore it depended on how far back articles regarding participatory processes in forestry could be found. While setting the searching options and terms, the search-territory was focused only in European region and the search-field was consisted of article title, abstract and keywords. In total, 68 papers were identified within the primary selection.

3.2.3 Secondary selection

A secondary scan was executed via a thorough examination of the abstracts and ensured that potential articles which include empirical case-studies were selected. Finally, 38 papers were excluded due to any of the following reasons; no case-studies of participation, case-studies were located outside Europe or the articles were written in another language than English. After secondary selection, 30 articles including 3 method reviewing studies during year 2006-2018 were retained. The result comprises 47 cases from 18 European countries (see table 1). The total number of 47 cases were counted according to the abstracts and contents of articles. A detailed textual reading was conducted particularly in the 3 method reviewing studies due to the difficulty of recognising the amount of cases from abstracts. The finally identified articles were clustered into three meta-data categories (see figure 2): Forest Management Planning, Forest Policy Formulation, Decision Support System (see table 1).

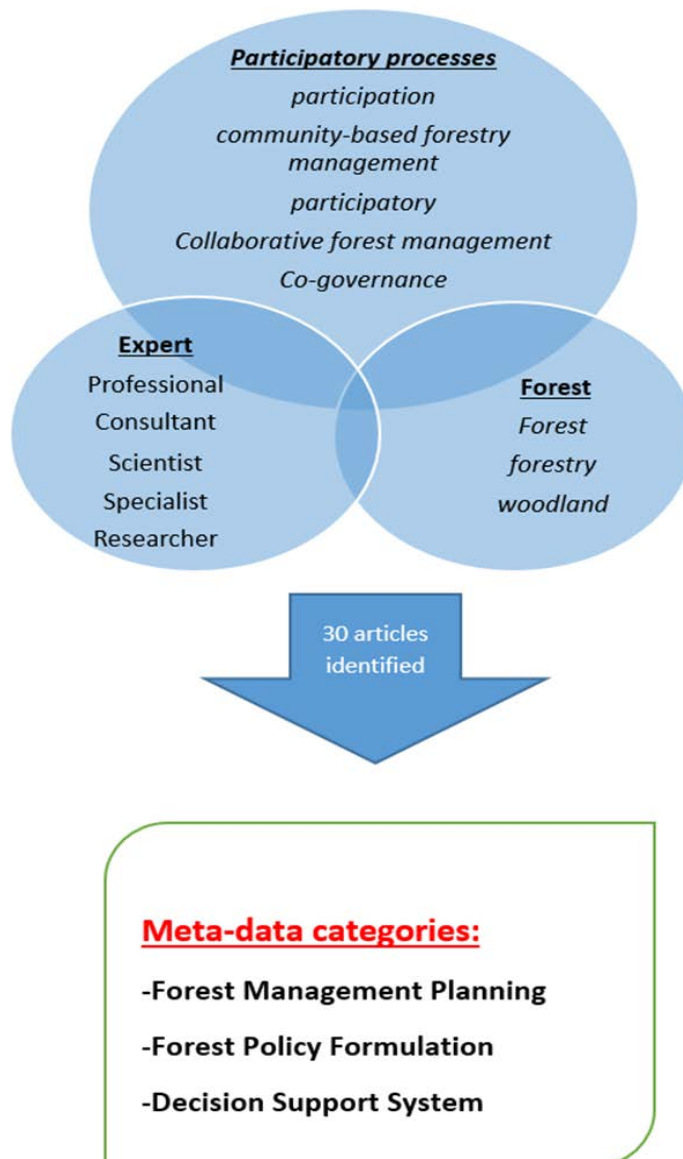


Figure 2 Procedure of data collection: Identification of relevant articles

Table 1. Procedure of data collection: Identification of relevant articles

Meta-data Category	Articles	Location of study	Types of experts
Forest Management Planning	Paletto, A. et al., 2015	Italy	Researcher, administratively based expert (regional authority)
	Martín-Fernández, S. & Martínez-Falero, E., 2018	Spain	Unknown scientist, academic expert, lecturer, environment
	Valls-Donderis, P. et al., 2015	Spain	University academic, cultural and rural development, game management, environment
	Lipej, B. & Male, J., 2015	Albania	University researcher, visual communication (GIS & GPS), administratively based expert (governmental authority)
	Brescancin, F. et al., 2017	Slovakia	University and research centre, administratively based expert (public administration, ministry of the environment)
	Den Herder, M. et al., 2017	Finland	Researcher, game management, environment, landscape planning, recreation, economy, administratively based expert (environmental authority)
	Rautiainen, M. et al., 2017	Finland	Administratively based expert (public authority-Finnish forest centre)

Forest Management Planning, cont.	Grošelj, P. & Zadnik Stirn, L., 2013	Slovenia	Researcher, game management, administratively based expert (Slovenia forest service, institute of the Republic of Slovenia for nature conservation)
	Simončič, T. & Bončina, A., 2015	Slovenia	Researcher, forestry professional
	Mårald, E. et al., 2015	Sweden	Researcher, administratively based expert (governmental authority)
	Sandström, C. et al., 2006	Sweden	Political scientist, ecology, game management
	Carlsson, J. et al., 2017	Sweden	Researcher, education, game management, environment, administratively based expert (national, county level or local authorities)
	Carlsson, J. et al., 2015	Sweden	Researcher, unknown scientist administratively based expert (local and county forest agency)
	Marta-Costa, A. et al., 2016	Portugal	Fishery management, fire management, administratively based expert (technical bureaus of forestry, territorial administrative units, national forestry authority)

Forest Management Planning, cont.	Carvalho-Ribeiro, S.M. et al., 2010	Portugal	Visual communication, administratively based expert (municipal forestry office)
	Janse, G. & Konijnendijk, C.C., 2007	Urban woodland case study (Italy, Belgium, Finland, Bulgaria, UK, Sweden/Denmark)	Silviculture, urban forestry, landscape architecture, sociology, human ecology, visual communication (GIS), administratively based expert (municipal administration, town council, forest administration of the ministry, agricultural agency, environmental administration, monuments and sites division, land-use planning department)
	Lakicevic, M. et al., 2014	Serbia	Administratively based expert (local authority)
	Köck, G.& Brenner, H., 2015	Austria	Scientist of University, recreation, administratively based expert (environmental authority)
Forest Policy Formulation	Saarikoski, H. et al., 2012	Finland	Administratively based expert (regional forestry centre, regional environment centre)
	Sarvašová, Z. et al., 2014	Slovakia	Administratively based expert (state and public institutions, forestry agency)
	Balest, J. et al., 2017	Czech Republic	Forestry faculty of Czech university, administratively based expert (ministry of agriculture and ministry of the environment, nature conservation agency)

Forest Policy Formulation, cont	Sandström, C. et al., 2016	Sweden	Researcher, Swedish Defense Research Agency(research Centre)
	Wallin, I. et al., 2016	Sweden	Researcher
	Sotirov, M. et al., 2017	Germany	Researcher, forestry scientist, administratively based expert (public forest manager)
	Maier, C. et al., 2014	Germany	Scientific expert, unknown scientist, administratively based expert (state forest service and state conservation)
Decision Support System	Vacik, H. et al., 2014	literature review (selected case studies in six European countries Austria, Czech Republic, Finland, Germany, the Netherlands and Slovakia)	Unknown scientists, forestry professional, visual communication (GIS)
	Lange, E. & Hehl-Lange, S., 2010	UK	Landscape planning, recreation, visual communication (3D vision), administratively based expert (national park authority)
	Huber, P. et al., 2017	Austria & Finland	Researcher, non-wood forest products yield expert, administratively based expert (provincial forest authority)
	Hujala, T. et al., 2013	Global Review	Researcher, forestry professional, visual communication (GIS)
	Khadka, C. et al., 2013	Global Review	Researcher, visual communication (GIS)

3.3 Content analysis

3.3.1 Establishment of analytical categories

Identified articles were subjected to an assessment by using two-levels of analytical categories (see figure 3). The main analytical categories correspond to the research

questions. They were intentionally created to distinguish how experts participate and function in different contexts. And, the sub-analytical categories were for a more in-depth analysis of the differences and similarities of the roles of experts between case-studies.

First main analytical category - *Type of participatory process*; according to the ladder of citizen participation (Arnstein, 1969). Reviewed case-studies were divided either into sub-category (informing and consultation) or sub-category (placation and partnership). It was intentionally to find out how experts are placed in different degree of democratic participatory processes.

Second main analytical category - *Importance of expert-based knowledge*; explores the contribution and critical arguments of experts. Contribution refer to the value, function and actual assistance that experts bring into participatory processes, for instance, providing scientific advice, facilitating processes or giving technical support.

Third main analytical category - *Relations of stakeholders*; looks into how experts balance or be balanced in power distribution during the processes, moreover, to see how experts play their roles in different alliances or oppositions among stakeholders.

Fourth main analytical category - *Types of experts*; are defined to recognise types of experts in divergent situations, and to review how much weight can authors elaborate experts from practical cases? Beyond, to find out how exhaustive that experts could be described in articles.

3.3.2 Text coding procedure

NVivo was the software program used to support the process of text coding. It helped to construct and organise a multi-hierarchical category system efficiently and it was a practical tool to note and mark key threads as well as to produce statistical results in diagrams. Coding procedure: 1. Read through the texts 2. Identified potential evidence (words, terms, themes, phrases, sentences, paragraphs) 3. Assessed and interpreted the meanings 4. Choose a suitable analytical category to place it in.

For instance, one sentence “The government-led participation process in Baden Württemberg was rather a complementary consultation process (Sotirov et al., 2017).” was identified and categorised in sub-analytical category of informing and consultation.

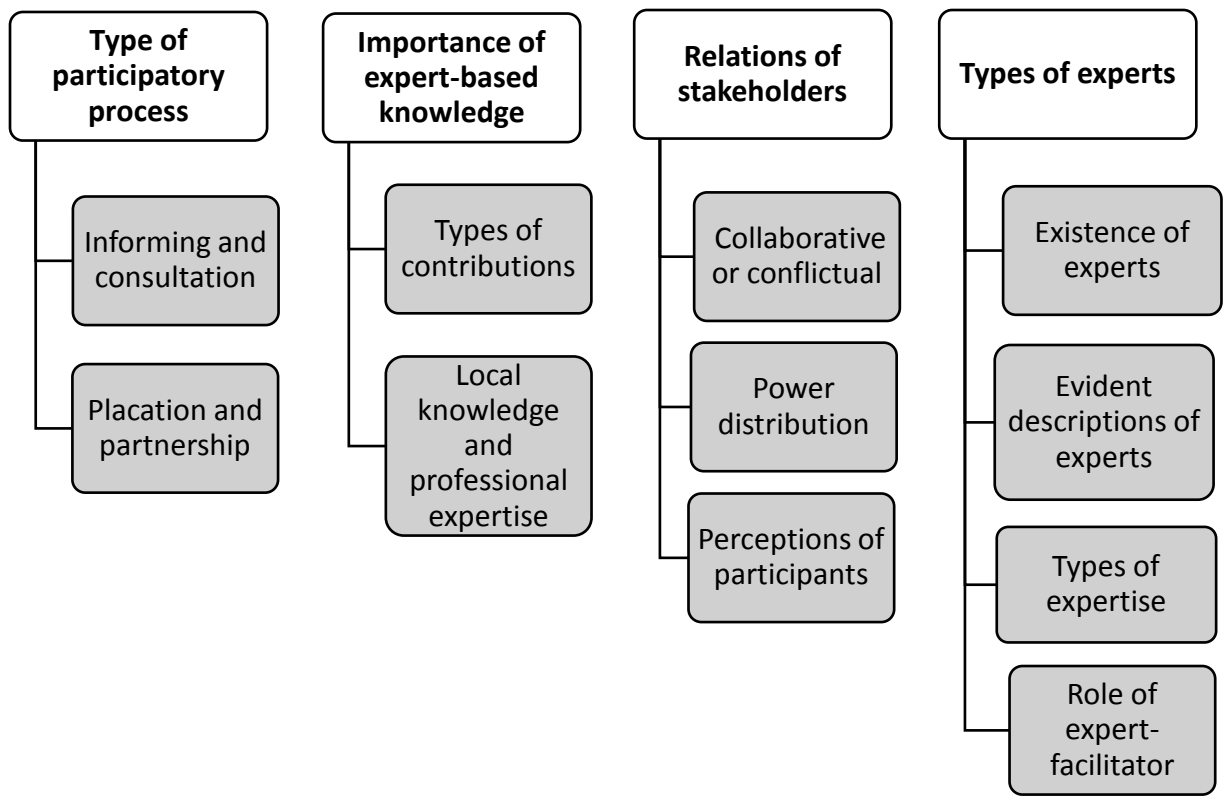


Figure 3. Framework of main and sub-analytical categories

4. Results

4.1 Type of participatory process

4.1.1 Informing and consultation cases

Ten coded informing and consultation case-studies are from Southern or Eastern Europe, only one case was held in Germany. In informing and consultation cases of participation, experts often function as consultants. They give one way advice and information. For instance, (Brescancin et al., 2017) analyses stakeholders' involvement in the implementation of the Natura 2000 network in Slovakia and points out that experts from environmental NGOs, universities and research institutes worked with locals and gave the technical support with designation and analysis of the sites.

Some evidences have been found that scientist are used as alibies. With scientific support, governmental authorities usually hold on to the power and are in control. For instance, the formulation and implementation of the National Forest Programme in Czech Republic (Balest et al., 2016) and the public participation in sustainable forest planning in Slovakia (Sarvašová et al., 2014), are cases of scientific expert-driven policy formation and management planning.

The case of the Austrian Wienerwald biosphere reserve (Köck and Brenner, 2015) reveals an inefficient outcome of informing participatory process. It took a long time and still many city-residents are not even aware they live in a biosphere reserve.

4.1.2 Placation and partnership cases

Eighteen placation and partnership case-studies are found, mainly recorded in Northern Europe. Here gives opportunities to other participants to get deeper involved in planning and decision making, so experts are no longer the only adviser. Instead, experts mix their roles more like "expert-facilitator". For example, certain cases concern the collaborative management with reindeer husbandry and indigenous Sami people (Sandström, et al., 2006), the endangered animal protection project: grouse-friendly forest management in Finland (Rautiainen et al., 2017) or the contradiction of economy oriented biomass utilization towards to environment conservation (Den Herder et al., 2017).

Following studies demonstrate the value that experts add in the facilitation during the processes: Albanian case (Lipej and Male, 2015) recorded a successful participatory mapping work were completed together by researchers, local professions and public authority. (Wallin et al., 2016) applied participatory action research model and attempted to engage local stakeholders in visioning their common future, (Sandström et al., 2016) reports in a conception of achieving a desired sustainability in future forest management and (Carlsson et al., 2017) aggregated from local to national level of authorities, ENGOs, forest industries and entrepreneurs as well as researchers, collectively to create a better integrated landscape planning.

Even though some efficient outcomes are seen by involving more groups' interest and expertise, the study (Janse and Konijnendijk, 2007) of collaborative urban research project mentioned the complexity and difficulty to organise such partnership-participation.

4.2 Importance of expert-based knowledge

4.2.1 Types of contribution by experts

The identified contribution of experts are categorised into four types: Provision of knowledge-base; Supportive attitude towards participatory decision-making; Roles as facilitator, organiser and observer; Contribution of social network and external contacts.

Provision of knowledge

(Balest et al., 2016) observes significant weaknesses during the national forest programme formation as being connected to the skill and knowledge of participants. One participant even asserted: "I think that one of the most important elements to promote a good participation is a high level of knowledge. I think that it represents the foundation of the discussion." (Martín-Fernández and Martínez-Falero 2018) shows a case study followed democratic formalities and organised by a form of third party which comprised scholars and scientists from the university and it mentioned, due to this firm knowledge base, the confidence was reinforced substantially among the participants.

In practice, (Paletto et al., 2015) also points out the importance of scientific knowledge when conducting inventory or mapping sites. Expertise of visual communication and process facilitation are often involved in large scale landscape planning. For instance, the rural infrastructure project (Carvalho-Ribeiro et al., 2010), operated under landscape cooperation with regional government agency.

In some occasions, expert serves as a consultant or so called an advisor. E.g., in (Lakicevic et al. 2014), experts consult in defining management policy as well as in (Simončič and Bončina, 2015) academic and governmental experts give advice of evaluating if forest functions is a useful tool for multi-objective forest management planning. The public participation often take place in an iterative form which enclose survey, questionnaire, workshop, consultation meeting, etc., and alternatively, it requires expert-based assessment or analysis. (Carlsson et al., 2015) regards the consistent analysis of task is best handled by experts who could provide both professional knowledge and overview.

Supportive attitude towards participatory decision-making

Principally, academic experts manifest a supportive attitude towards participatory decision-making, they agree that society should be involved in sustainable forest management to increase the legitimacy (Maier et al., 2014). Moreover, (Sotirov et al., 2017) demonstrate the federal-state level of case studies which concern about increasing participation of non-governmental societal groups in policy making stage. Researchers from the study of forest fire prevention (Marta-Costa et al., 2016) call for that the government should increase awareness and willingness of residents to be part of participation.

Roles as facilitator, organiser and observer

(Sandström et al., 2016) and (Sotirov et al., 2017) give examples in which the researcher plays role as facilitator, they prepared and guided the processes. In this type of process, scholars try to lead it in non-biased condition, ensure that every voice is heard. In addition, a controversial management issue (Mårald et al., 2015), concerning the introduction of tree species to adapt climate change, the engaged researchers acted as organiser, observer and as well expertise provider.

Contribution of social contacts and network

In the phase of forest management, (Saarikoski et al., 2012) indicates the representatives of environmental NGOs found that their expertise were identified advantageous and added value to the regional forest planning because they have additional contacts with private amateur naturalists who know forest nature or particular species better than administration. (Janse and Konijnendijk, 2007) reveals the network development between local and professional expertise. In addition, Grouse-friendly forest management in Finland use local contacts to aid grouse restoring project (Rautiainen et al., 2017).

4.2.2 Collaboration of local knowledge and professional expertise

In the sense of reaching sustainable forestry, participatory approach should ideally be offering a more equal platform where every participant is given equal right to express themselves. In environmental policy making, scientific information is essential but maybe not sufficient to make judicious decision. In some nature conservation cases the locals are more familiar the potential habitat sites and be able to provide useful know how (Brescancin et al., 2017, Köck and Brenner, 2015). Still, inequalities exist which result in omitting local knowledge, customary right and accessibility of land use. For example (Wallin et al., 2016) concluded that in their case the local voice was ignored by national policy-makers.

On the contrary, in state-owned forestry, the professional expertise is the only or the main mechanism to conduct interventions in forests. Activities highly depend on professionally privileged individuals, e.g., administrative foresters (Balest et al., 2016, Simončič and Bončina, 2015, Sarvašová et al., 2014). Therefore, (Marta-Costa et al., 2016) calls for the government to take responsibility to promote the exchange of expertise.

Examples of actual collaboration between local knowledge and professional expertise: In an Albanian participatory mapping activity (Lipej and Male, 2015), authority shifted the power to community, hence the locals held the lead and conducted map-making with researchers and governmental expert. Even though the entire process took more than a decade, the achievement was satisfactory. Another case, was carried out in northern Sweden where there is a complicated situation of land-use involving reindeer husbandry (Sandström, 2015). Together with researchers, the state, regional agencies and the community of reindeer husbandry launched a participatory process to overcome this issue that proved successful.

(Janse and Konijnendijk, 2007) illustrates a radical action to promote lay knowledge. It initiated “connoisseur approach”, namely, intended to stimulate capacity building amongst

the local experts. Further, it aimed to facilitate the exchange of ideas and connect the network of scientific professionals and actual forest managers to be part of management decision making for local scale. Authors especially noted the selection of local connoisseurs was difficult owing to the diverse levels of interest and capability.

4.3 Relations of stakeholders

Three articles were coded including evidence of collaborative and none were coded including clear description of opposition among stakeholders. Some evidences of unequal power distribution were identified.

4.3.1 Collaborative or conflictual relations between participants

The majority of actual participatory processes are related to economic or environmental issues. Stakeholders are often in some kind of conflictual relation with each other, yet, some exceptional expert-led examples of alignment are revealed from the results. For example, grouse-friendly forest management in Finland (Rautiainen et al., 2017), resulted in an increasing number of grouses and awareness of private owners who after the intervention believe in the possibility of maintaining simultaneously stable timber production and abundant grouse population. Additionally, in Serbia (Lakicevic et al. 2014), a researcher-led process collaborated local authorities and experts, and came to the end with a selection of the most appropriate management policy. (Huber et al., 2017) also shows a successful participatory assessment of non-wood forest products. It integrated expert-driven and experience-driven knowledge, and further it proceeded to a set of stakeholder interplay processes.

4.3.2 Unequal power distribution

Some negative influence of uneven power and expertise distribution were identified. At policy formation stage, public participation in sustainable forestry is supported by legislation, while there is no resolute guidance of who should be represented in processes. Therefore, it involves plurality of groups with different expertise and interests. This may give prominence to the risk of associated lobby and acceptance among participants (Sarvašová et al., 2014). For instance, if the more powerful participants collaborate together, the less powerful participants have less influence in decision making. In addition, (Maier, C. et al. 2014) raises an example of unfair processes: citizens who feel pressured and unconfident sitting across the table with public authorities, industrial delegates and ENGOs. (Balest et al., 2016) also mentions that during national forest programme formation, the process was unable to raise awareness with required specific expertise, thus, it reduce citizens' willingness to join in processes.

4.3.3 Perceptions of participants

Engaging numerous of stakeholders to work on the decision making has its limitations. Perceptions of participants are influenced by certain limitations, for instance, issue of trust, inequality of participatory degree and lack of willingness and capacity. Khadka et al., (2013) and Wallin, (2016) refer that when conducting a process needs to consider the issue of building participants' trust. Placation cases give citizens an opportunity to advise, however, such unequal participation potentially induce negative perceptions (Balest et al., 2016,

Sarvašová et al., 2014). (Maier, C. et al. 2014) raises an example that citizens who feel unconfident to be in the participation due to lack of capacity. Additionally, lack of willingness is influenced by participant's perception during the process and it may increase the possibility of absence (Mårald et al., 2015).

The difficulty when conducting modelling approach is that it requires proficient expertise and also challenges experts to establish a firm trust among the participants. Furthermore, it needs to clarify how the group-learning type of action differs from expert-driven planning. The obstacle is that it receives different perceptions from participants. An intense scene was recognised from Khadka et al., (2013), it described that the process-preparation placed resource-experts and locals in a same level of learning positions, then it induced unexpected frustration and loss of professional dignity.

Solutions for adapting such issue can be, first, change the learning position immediately to avoid the big gap of learning ability when it sense the frustration appears. Second, gather participants afterwards to discuss how they feel and how they suggest to adjust the position-placement for the future monitoring and improvement.

Once frustration become exhaustion, it affects the quality of the process, e.g., time consumption and final outcome. Here emphasis again on the importance of expert-facilitator's responsibility and sensitivity. They need to pay more attention on behavioural, emotional, and physiological responses among the group. In addition, they also need to regulate the intensity of contradiction for strengthening the facilitation.

4.4 Types of experts

4.4.1 Evident description and existence of experts

The sub-analytical categories: existence of experts and evident descriptions of experts try to review the weight that authors elaborate experts from practical cases and to find out how exhaustive that experts could be discussed in articles. The category of existence of experts shows the coded texts contain only one word or one phrase to represent experts. The category of evident descriptions of experts signify two kinds of coded texts, first is contain manifest types of experts with very limited information about experts, second is contain detailed elaborations about experts. Results indicate that the majority of articles failed to describe experts but still some evidences (extracted texts) are identified and demonstrated as below.

-Examples of code texts contain only one word or one phrase to represent experts:

"Other stakeholders to be involved include organized interests such as conservation or recreation groups, forest owners, experts and the general public." (Maier et al., 2014)

"The involvement of supporting organisations including governments (at various levels), non-governmental organisations, universities and other actors engaged in development and land-related planning." (Lipej and Male, 2015)

-Examples of coded texts contain manifest types of experts with very limited information about experts:

“Scientists from the multidisciplinary project teams (i.e. experts in silviculture, urban forestry, landscape architecture, sociology and human ecology)” (Janse and Konijnendijk, 2007)

“The interdisciplinary research team included one ecologist, one economist, one professor in reindeer herding, one political scientist and one research communicator (facilitator)” (Sandström et al., 2006)

“A group of 34 people participated. Their profiles were analysed and they were classified in the following groups: users for recreation (14 participants), environmentalists (9), hunters (2), forestry professionals (4, both with and without a university degree) and professionals of cultural and rural development activities (5)” (Valls-Donderis, P. et al., 2015)

-Examples of coded texts contain detailed elaborations about experts:

“The roles of the facilitator (expert in democratic and constructive group communication), the modeller (expert in modelling, i.e. problem structuring in particular), and/or the analyst (expert in decision analysis)” (Khadka et al., 2013)

“Here, we define scientific knowledge as more general and expert-oriented in different societal areas, whereas stakeholder knowledge is expert knowledge on the local situation and relations.” (Carlsson et al., 2015)

4.4.2 Types of expertise

An overview of resulting types of expertise identified can be seen in figure 4 and table 2. Here I will briefly describe what is meant with the different types of expertise.

Administratively based-experts

Administratively based experts include policy analysts, economists, legal adviser, etc. (Primdahl et al., 2018). They specialise in administrative matters and specific issues such as ecology and cultural heritage. Experienced professionals from environmental and forestry administration handle the data collection, analysis of forest related growth and utilisation, as well as ecological value (Maier et al., 2014, Saarikoski et al., 2012). In the nature of public service, the preparation and coordination of participatory approach are evidently directed by administratively based-experts (Sarvašová et al., 2014).

Expertise of forest management planning and policy formulation phases

Administratively based expert, scientist and forestry professional are commonly recognised in policy formulation phase. Expertise such like education and economy are particularly identified in management planning phase. Environment and game management (reindeer herding, hunting) are observed as prevalent subjects of experts. Experts of non-wood forest products and visual communication, e.g., GIS (Geographic Information System) and 3D-vision are seen as a present and near future tendency when the processes make use of decision support tools (see table 2).

The projects of collaborative landscape planning with local or regional government agency in rural area touch upon subjects: engineering; fire management; fishery management; landscape architecture and planning; cultural and rural development (Sami culture). The dense residential region requires a pool of expertise. Experts of urban forestry and recreation are fundamental required. Disciplines as human ecology, sociology are also interestingly included (table 2).

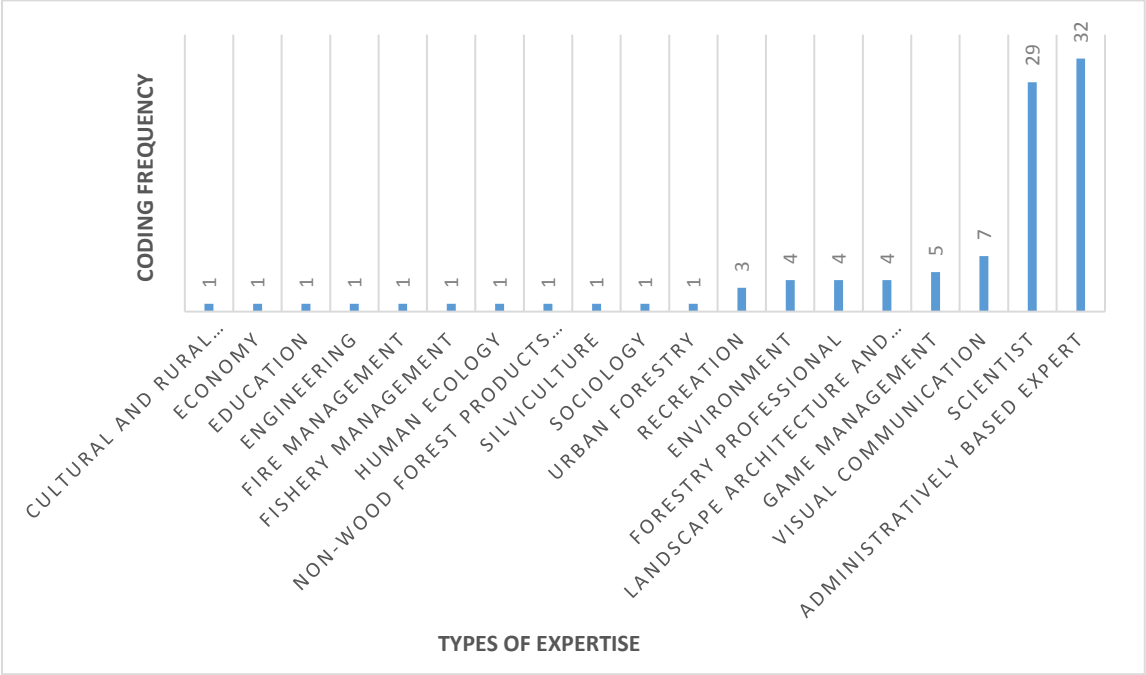


Figure 4. Coding frequency of identified expertise per case. The result comprises 47 case-studies from 18 European countries (see table 1). The total number of 47 case-studies were counted according to the abstracts of articles. For more information see 3.2.3.

Table 2. Coding frequency of identified expertise in metadata categories

Meta-data category	Identified expertise	Coding frequency	
Forest policy formulation	Scientist	8	
	Administratively based expert	7	
	Forestry professional	1	
Forest management planning	Administratively based expert	23	
	Scientist	17	
	Game management	5	
	Environment	4	
	Landscape architecture and plan	3	
	Visual communication	3	
	Recreation	2	
	Economy	1	
	Education	1	
	Forestry professional	1	
	Human ecology	1	
	Silviculture	1	
	Sociology	1	
	Urban forestry	1	
	Cultural and rural development	1	
	Engineering	1	
	Fire management	1	
	Fishery management	1	
	Decision support system	Scientist	4
		Visual communication	4
Administratively based expert		2	
Forestry professional		2	
Landscape architecture and plan		1	
Non-wood forest products yield		1	
Recreation		1	
Total		99	

4.4.3 The role of expert-facilitator when the participatory process is assisted by decision-support tools

Many experts of natural resource management are invited or expected to use decision-support tools to accelerate participatory approach. Problem structuring, collaborative planning, GIS, 3D-vision, aerial photographs, remote-sensing images and GPS (Global positioning systems) are repeatedly used in articles and noted that their practical contribution such like analysis of distinctive subject focusing on vegetation situation, flood risk management and spatial location of facilities (Huber et al., 2017; Lipej and Male, 2015; Vacik, H. et al. 2014; Hujala et al., 2013; Khadka et al., 2013; Sandström et al., 2012; Lange and Hehl-Lange, 2010). Two other case-studies are assisted by decision-support tools,

(Janse and Konijnendijk, 2007) reported an urban forestry research project called Neighbour Woods and (Lakicevic et al., 2014) carried out the multi-criteria approval method in order to define the best management policy.

With respect to common issues of participation, public and experts' perceptions are sometimes based on biases, anecdotal evidence and false assumptions. Yet, scientific experts usually provide statistical data, conduct facilitating models, use computer-based techniques, etc. to consolidate the processes. However, it is still required to take consideration of public perception and preference for achieving the legitimized degree (Janse and Konijnendijk, 2007).

When the participatory processes are assisted by different tools, experts are prevalently observed as modeller or facilitator. Modelling approach not only supplies enough flexibility to incorporate opinions, knowledge and information between public and scientists, but also stimulates the capacity-building and the association of distinct disciplines. Meanwhile, expert function as facilitator to bridge up the relations among participants. Their responsibilities are to mediate and advise in the complex debate between multiple actors as well as solve the technical problems (Albert & Vargas-Moreno, 2011).

Many obstacles are encountered in practice, since applying decision-support tools and specific methodologies requires specific knowledge, available data and proficient personnel. The modelling process also challenges the expert to set up new inputs and react timely. It needs to consider technological facilities or software investment and the public/political willingness about introducing new technology (Lange and Hehl-Lange, 2010).

5. Discussion

5.1 Experts in phases of policy formulation and management planning

In comparing management planning and policy formation, the common feature is that experts need to deal with multiple kinds of stakeholders. Yet, in the management planning stage, it is chiefly experts that are requested to work with local authority and professionals. Hence, experts are suggested to be more authentic and consider to put their feet in locals' shoes to adapt the conditions. Administratively-based experts are particularly required to transform themselves to be more flexible than the former traditional bureaucratic manner, meanwhile strengthen the technique and ability for mediating such occasions (Kleinschmit et al., 2018).

Policy making processes from regional to international scale focus rather on higher level objective, and the structure of the participatory process is framed in accordance with conceptual direction and future envision. Thereby, the participants, including the experts (e.g., researchers, administratively based-experts from state forestry and state conservation agency) are mainly arriving from the top of their organisations hierarchy, for instance, the district head officer.

Modern societies are characterised by a multitude of knowledge sources and high levels of scientific literacy. However, it does not imply that society in general and politics in particular are now informed by better knowledge. A problem has been identified when evaluating the importance of scientific expertise for decision making: an over-selling of scientific results based on the assumption that science could speak truth to power (Grundmann, 2009). And, this ultimately leads the inequality of power and expertise distribution, or, the perception of an unfair process, or, a risk of becoming tools in the hands of already powerful actors to advocate their interests, or, instead of finding an applicable solution as consensus, the contradictions emerged increasingly with antithetical opinions. The issue of "neglect of local voice" is connected to this point. With this regard, a coordinator can be set on the linkage of local knowledge and professional expertise. Moreover, the co-production such as tools, methods, solutions and findings are generated between local practice and scientific knowledge. They potentially influence the outcome in a positive way because the combination covers reliable and realistic local information, e.g., the case of natural conservation management gives a good example of collaboration of local and scientific expertise. The coordinator can also be a key to connect external channels of experts, administrators and politicians on different levels, e.g., the local level of environmentalist or national level of agricultural agency.

In addition, the diverse skill, expertise and resource accessibility among stakeholders can strongly compromise the process with personal influence. For instance, experts from NGOs which are branded with exceptional competence and knowledge are considerable vital in processes. Without such higher level ability, it can be difficult to articulate own principles and interests in a systematic manner, especially in open discussion conference. And this may directly and indirectly influence the final decision. Moreover, experts of NGOs are commonly marked as advocacy scientists. Typically, advocates are motivated by the

concerns regarding the future of society and the environmental issues (Grundmann, 2009). In such contexts, experts use their scientific expertise as instrument to influence relevant policy formulation or specific course of action.

5.2 Demand for developing expertise network

In participatory processes, knowledge exchange takes place. Under new modes of governance, the expertise and relevant resource are built on a more complicated network. If experts could collaborate with their own social contacts of expertise and also with the experts from other representativeness, it would be beneficial inputs for processes. This reveals a message that is how to integrate different expertise to become a more efficient and robust connection. Instead of a focus on taking oppositions against each other in the processes, it should concentrate on utilizing the modern technology to build information sharing sites for more transparent and quick accesses. This platform-site could ideally assist participants to find expertise-resource, to inquire relevant questions or to create a discussing forum. Yet, the concern is who should be responsible on setting and maintaining such platforms? However, the difficult encounter is that participants are characterised with numerous level of skills and willingness, the probability of a successful knowledge integration is perhaps low. Legislation has its compulsive effect, therefore, a legislative change on the formation of relevant mechanism and organization may increase its possibility.

5.3 Urban forestry

Urban forestry stands out in the results. Two reviewed articles including seven urban woodland case studies across Europe refer the clear need for a diverse range of professionals in public participation.

Urban forestry is not only concerning traditional public areas, e.g., parks but also kinds of ownership or co-management arrangements such as community wildlife gardens and school nature areas. This provides opportunities for community involvement and requires different types of expertise for consultation or education. The awareness of urban forestry become prevalent can be explained with a growing recognition that the urban forest can moderate some environmental and social issues, e.g., air pollution, storm water flooding, decreasing biodiversity and social exclusion (Jones et al., 2005).

Urban forest management is employed closely to the city life which is related to a great amount of population with specific requirement. Consequently, incorporation of the extensive scientific knowledge into forest-related landscape planning is a rigorous task for scientists, city residents and decision-makers. Since participatory approach is a process of communication, the relations between stakeholders could seriously vary the capacity of communicating scientific resource (Shannon, et al. 2007). For future urban forestry, to develop adequate joint knowledge resources, collaborate local and professional expertise as well as make decisions locally obtain not only greater acceptance and facilitation of policy implementation, but also beneficially generates more effective management planning.

5.4 Facilitator and broker

Facilitator is a key factor to promote successful participatory processes. Their function is to take a neutral position to intervene conflicts and to balance power distribution during the participation. On the one hand, they have to be familiar with participants' backgrounds in terms of culture and economy for responding different requirements or concerns. On the other hand, they also need to connect between local knowledge and professional expertise, as well as be sensitive to the inequalities of communicative competence and dynamic mood amongst members.

From local to national scale, landscape management related participatory processes demand multitudinous expertise and a strong leadership - landscape coordinator, so called broker (Carlsson et al., 2017). Broker is basically functioned as an expert-facilitator, but they are required for more responsibilities, e.g., interpret scientific knowledge and legislative policies into practical advices, advocate the landscape perspective and secure quality evaluation as well as monitor the processes.

In comparison to facilitator, a broker has operational capacity to steer the process. Broker can also be a group-form to share the workload or tasks. Make sure the interests of stakeholders and promote the collaboration in local region are their duties. In this respect, the small voice of local knowledge could possibly obtain some help from them. Occasionally, under the circumstance when the roles of expert and facilitator are mixed, as combined their expertise of problem settlement and technique application. Participants may become confused with the information they receive and wonder if it is an advice or a command

5.5 Inadequate explanation and description of experts

Referring back the coding process, the textual interpretation of identifying expert was particularly time consuming. Certain ambiguities such as definition and characterization of the role became a confusion while evaluating the meaning of phases and categorising the texts. Some terms, e.g., “forestry professional” or “scientist” were identified with inadequate explanation of the position, these roles' appearance are most likely just an “existence”. In the sense of representativeness, a “forestry professional” could be employed by private sector or public authority and a “scientist” could specialise in any kind of field.

Another example, it was aimed to find any evidence regarding the concern of “which institution or organisation expert represents from?” while proceeding the category of decision support system. Yet, in most of articles, there were just not enough clues or descriptions. Such basic information of character's profile should be remarked in any participatory approach related study. Certainly, there are examples of sound description are already presented in above section (evidence of expert).

There are two possibilities could be explained. First, those experts maybe exist in cases but the authors miss-describe them. This may reflect to why some experts such like machinist, veterinarian, agronomist, biologist, historian, geographer, legal specialist are all potentially relevant to actual management but they were not found in the articles. Second, in the majority of reviewed articles, experts play their roles as facilitators and use decision-support tools to accelerate processes, thus they stress rather on how processes influence

final outcomes. This results the problem of inadequate explanation and description of the role, and could possibly affect other later researches' results and quality.

5.6 Limitations of the study

This study confirmed that executing content analysis requests experienced technique to select articles and assess reviewing material. Some errors are noted for future improvement.

First, regarding time consumption. Ensuring that searching terms and set-ups on Scopus are correct is important when conducting first article selection. A mistake was made due to the territory was forgotten to choose in Europe region. It needs a lot of efforts to trace back in articles/ texts and examine again. Moreover, the definition of words or phrases must be clarified and understood since that can affect the accuracy of code results, e.g., “research centre” and “ecology” were miscategorised in category–scientist while identifying types of experts.

Second, the realisation of knowing how limited clues of expert could be identified came after the coding process, and this leads the difficulty: lack of materials to work on final analysis. Thus, the lesson has learned is try to keep research questions more general when choosing a topic that it has already known as a narrow theme. Because there were moments caused the back and forward adjustments of meta-data / analytical categories to make sure that the process can answer research questions. Furthermore, a better and more detailed discussion with guidance is necessary for initiating the drafts of article-selection criteria and structural meta-data / analytical categories frameworks as well as the evaluating checklist and criteria.

6. Conclusion

There is uncertainty about the value and function of experts in participatory processes. Even though there are many studies of case studies of different participatory processes, very few have had a focus on the role of experts. Thus, the aim of this study is to investigate the role of experts in forest-related participatory processes in Europe and explore what influence they bring into the phases of policy formulation and management planning.

The identified values and functions of experts are:

- Provision of knowledge-base
- Supportive attitude towards participatory decision-making
- Identified roles as facilitator, organiser and observer
- Contribution of social network and external contacts

Results indicate the necessity and importance of experts' involvement. Without their knowledge and support, the participation cannot possibly process, particularly, in practice with demands of multiple expertise under different scenarios. The contribution of social contacts with external expertise that experts deliver in the process requires a collaborative development on building a network for obtaining more efficient resource and outcome.

Governmental experts from the top of the hierarchy are evident because the stage of policy formation focus rather on a future envision. And, in management planning phase, experts primarily are requested to cooperate with local authority and professionals. Researchers are frequently recognised as facilitators when participatory processes are assisted by decision-support tools. Expert-facilitator play the multifunctional role to sort technical problems, advise in complex debates and bridge the relations among participants.

Administratively based experts and scientists are the most identified types of experts. Both roles are confronted by dealing with other type of experts (local knowledge, societal actors). They are no longer the only alternative for advices, in fact, they are situated a relatively strategic position between phases of politics and implementation. Thus, they need to alter former attitude and manner to seek an effective way to communicate with other stakeholders. Particularly in rural forestry context, it exists a significant scarcity of communication. Moreover, upgraded social skill and sensibility are expected from the role of expert-facilitator for avoiding the emergence of frustration or exhaustion among participants.

Despite scientific expert's position is biased, political as well as situated in between of government and public. This shows how experts need to communicate in an appropriate way to handle the requirements from the bottom to the top of societal and political hierarchy. At the same time, they continue on experimenting and attempt to improve the procedure. Consequently, expert contribution should not be ignored.

Recommendations for future research, first, a better elaboration on the role of expert may conduce a fine later analysis. During the coding process, the textual interpretation of identifying experts was time consuming due to inadequate explanation and description of the role. This is not only a call for the single role "expert", other roles also deserve better

description in the article, particularly when reporting such multiple stakeholders involved case-study. Second, propose a vast exploration on a larger scope of “expertise” which includes greater variety of experts, e.g., local knowledge, technical professional, and could deliberate further on shifting to the global scale.

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