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Governance of non-wood forest products in Russia and Ukraine: Institutional rules, stakeholder arrangements, and decision-making processes

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ABSTRACT

Aspects of governance of non-wood forest products (NWFPs) include institutional rules, stakeholder arrangements, and decision-making processes that govern production systems from access to resources, their use, and to markets. Compared with other forest products, few studies have investigated the governance of NWFPs in European post-socialistic countries transitioning from a planned to a market economy. This study compares institutional frameworks and stakeholder arrangements related to NWFPs in Russia and Ukraine using a case study approach. Both countries have a legacy of top-down forest government, state-owned forests, and rural communities with a long dependence on plant- and animal-based NWFPs. We analysed legal documents for NWFPs in each country and conducted expert interviews with stakeholders from the public, private, and civil sectors involved in the decision-making process of NWFPs. Institutional frameworks for NWFPs in both countries are complex, unclear, and overlap. Multiple legal documents contain restrictions regarding the extraction sustainability of NWFPs. However, no special laws or policies are solely for NWFPs; all measures are included in legislation that regulates nature conservation and forest management. The government of both countries tends to overlook non-industrial forest use undertaken by marginal local communities, even if economic, social, and cultural values of NWFPs are relatively high for local and regional development. A misfit is observed between legal frameworks and forest companies' business policies with customary rights. This phenomenon caused a shift to introduce new stakeholder arrangements related to NWFPs as a special type of resource in areas where NWFPs are heavily used both for subsistence and for generating household income by local communities. Landscape approach initiatives such as model forests and biosphere reserves may empower local communities to find means to protect their rights, needs, interests, and values related to NWFPs.

1. Introduction

Non-wood forest products (NWFPs) are goods of biological origin other than wood that are derived from forest and woodland landscapes (FAO, 1999). Plant- and animal-based NWFPs have received increasing attention in sustainable forest management (SFM) policies (FAO, 2015; FOREST EUROPE, 2015, 2011). As a consequence, NWFP governance has emerged as an integrated part of the broader concept of forest governance (Wiersum et al., 2014). According to Agrawal et al. (2008) there are three main global trends in forest governance. The first trend is decentralisation of forest government, especially in developing countries where non-wood resources are vital for rural residents. The second trend is the increasing influence of private market forces on forest governance. The third trend is the increasing efforts to certify forests, including NWFPs harvests, as sustainable.

Governing forest resources is often based on command-control regulations using top-down decision-making processes (Agrawal and Gupta, 2005; Arts et al., 2014; Secco et al., 2011). Top-down governance has focused on controlling the allocation of resources among societal actors by operating institutions that provide rules establishing 'who gets what, where, when and how' in society (Howlett et al., 2009). However, the decentralisation of power from state authority to private and civil sector stakeholders at different levels of governance has become a widespread global phenomenon (Howlett et al., 2009). This shift has been frequently referred to as 'from government to governance' (Arts, 2014). One reason for this shift has been the decrease in trust of government authorities to manage, regulate, and

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control forests for the public good (Agrawal et al., 2008; Hackett, 2013; Wiersum et al., 2014). This shift may increase opportunities for diverse stakeholder groups at multiple levels to participate in policy discourse and resource management (Art and Visseren-Hamkers, 2012).

NWFP governance is about rules, decision-making processes, and stakeholder arrangements that govern production systems from access to the resources, their use, and to markets (Dhital et al., 2015; Sandström et al., 2011; Wiersum et al., 2013). Comprehensive studies describing specific cases of NWFPs governance in Africa, Asia, and Latin America have highlighted the need for more research, especially from continental European countries (Ingram, 2014; Laird et al., 2010; Ros-Tonen and Wiersum, 2005; Wynberg and Laird, 2007). However, compared with other forest products, few studies have investigated governance of NWFPs in Europe (Bauer et al., 2004; Bouriaud and Schmithüsen, 2005; Sandström et al., 2011). Given the importance of NWFPs as wild food and medicine for human well-being (Ghirardini et al., 2007; Łuczaj et al., 2012; Łuczaj and Szymański, 2007; Pieroni and Soukand, 2018; Sõukand et al., 2013), there is an insufficient number of comparative studies on the role of socio-economic, political, and cultural contexts in governance of NWFPs (Laird et al., 2010; Wiersum, 2017; Wynberg and Laird, 2007). For example, the governance of NWFPs in European post-socialistic countries in transition from a planned to market economy (Bauer et al., 2004; Bouriaud et al., 2013; Ryabchuk, 1996).

Since the collapse of the Soviet Union in 1991, NWFPs have become increasingly important for the livelihoods of people in rural areas in these countries (Matilainen, 2013; Ryabchuk et al., 2006; Stryamets et al., 2015, 2012). During the era of the Soviet Union, forestry was governed by governmental organisations using top-down decision-making based on a planned economy (Matilainen, 2013; Nijnik and Oskam, 2004; Nijnik and van Kooten, 2006; Sisak et al., 2016; Soloviy and Cubbage, 2007). A collection of mainly plant-based NWFPs was included in state forest management plans, and the government decided what type and how much NWFPs had to be collected by each state forestry enterprise (Nijnik and van Kooten, 2006; Ryabchuk et al., 2006). In rural areas, people had permanent jobs at different state organisations, including state forest enterprises.

The collapse of the Soviet regime led to the restructuring of all economic sectors, and bankruptcies of many state organisations, which caused a high level of unemployment in rural areas (Matilainen, 2013; Nordberg et al., 2013; Ryabchuk, 1996; Soloviy and Cubbage, 2007). As a consequence, many rural households became dependent on subsistence food production from their farms/gardens and from consuming and trading NWFPs (Elbakidze and Angelstam, 2007; Matilainen, 2013; Nijnik and Oskam, 2004; Soloviy and Cubbage, 2007; Stryamets et al., 2012). Therefore, additional research is necessary on legal rights and their implementation for NWFP access, use, and trade in East European countries in transition (Wiersum et al., 2018).

The aim of this paper is to analyse and compare the institutional frameworks and governance arrangements related to NWFPs in the two largest post-Soviet countries (Russia and Ukraine) in transition from a planned to a market economy. We analysed legal documents of plant- and animal-based NWFPs in each country and conducted expert interviews with representatives of stakeholders from public, private, and civil sectors involved in the decision-making process related to NWFPs in both countries. We discussed the impetus of the shift towards the new forms of stakeholder arrangements in governance of NWFPs and the role of landscape approach initiatives in this process.

2. Conceptual framework

Following Wiersum et al. (2014:2), NWFPs' governance is understood as 'the multi-stakeholder and multi-level process of interactive decision-making processes, and creation of institutional frameworks for the allocation, use, and trade' of NWFPs. Our analysis focused on the nature of institutional frameworks and stakeholder involvement in governance arrangements. Many scholars have considered NWFPs as the private or as the public good based on excludability and subtractability (Janse and Ottitsch, 2005; Ostrom, 2015, 2005; Sandström et al., 2011). Often, plant-based NWFPs are understood as public goods because of their low subtractability (e.g., one user's consumption of berries or mushrooms does not reduce the level of consumption by another user) and low excludability (e.g., difficulties preventing the consumption of resources). By contrast, animal-based NWFPs are characterised by high subtractability and high excludability, which are attributes of private goods (Janse and Ottitsch, 2005; Sandström et al., 2011). Each type of good has specific governance challenges that may require different governance arrangements. Because of these differentiations, we analysed the governance of plant-based and animal-based NWFPs separately.

To investigate governance arrangements of NWFPs, we performed a two-dimensional analysis of the existing systems that govern NWFPs in Russia and Ukraine. The first dimension was the institutional dimension. Specifically, we focused on analysis of (i) national legal frameworks such as laws, rules, policies, legal agreements, and regulations produced by official national authorities; (ii) market institutions, in this case the Forest Stewardship Council (FSC) forest certification; and (iii) customary institutions that regulate access to and maintenance of cultural, social, and economic values of NWFPs. Our main focus was to assess the sustainability of plant- and animal-based NWFPs, resources' accessibility, and their markets based on the regulations of the aforementioned institutions.

The second dimension was the role of the stakeholders related to production systems of NWFPs from extraction to trade. Engagement of multiple stakeholders was recognised as an essential attribute of sustainable environmental management and governance (Colvin et al., 2016). To map the stakeholder arrangements related to NWFPs, stakeholders were divided according to two dimensions (Bromley, 1991). First, drawing on methods used by Elbakidze et al. (2010) and Ingram (2010), we defined three groups of stakeholders according to the sector they represent: (i) the civil sector stakeholder group comprised organisations outside of government, including associations and non-profit organisations that contribute to the public good (Mingioni, 1991); (ii) the private sector stakeholder group comprised for-profit businesses; and (iii) the public sector stakeholder group comprised governmental agencies at different levels. Second, stakeholders were classified into two groups according to the level of activity. These were stakeholders of local (i.e., rayon in Russia and Ukraine) and regional (i.e., oblast in Russian Federation and Ukraine) levels of governance. Our target was to analyse institutional frameworks and stakeholder arrangements in decision-making process related to NWFP to understand if they were effective for sustainability of plant-and animal-based NWFPs production systems.

3. Methodology

3.1. Case study areas

We applied a framework for transdisciplinary research based on place-based case studies for knowledge production and learning towards sustainable forest landscapes (Angelstam et al., 2013, Per 2019). Preparatory work for this study focused on selecting representative examples of societal transitions in Northwest Russia (Naumov et al., 2017, 2016) and in Ukraine (Stryamets, 2016; Stryamets et al., 2012). The Kortkeros rayon in the Russian Federation's Komi Republic and Roztochya in Ukraine's Lviv region were selected as case study areas (Fig. 1). These regions represent post-Soviet contexts with legacies of top-down forest government, state-owned forests, and rural

Fig. 1. Case study areas Roztochya (Ukraine) and Kortkeros district (Russia)

populations with a long history of dependence on NWFPs as wild food and medicine for personal consumption and for trade.

Kortkeros district (rayon) (60°45′ N - 62°50′ N and 50°45′ E - 53°30′ E) is located in the Komi Republic at the eastern edge of the European part of Russia (Elbakidze et al., 2010; Naumov et al., 2017). The total area of Kortkeros rayon was 19,748 km^2, with 90% forest cover (Naumov et al., 2017). The population density was < 1 person per km^2 (Table 1) (Shestyukova, 2012). During the Soviet regime, the state forestry enterprises in the Komi Republic played a critical socio-economic role in rural areas by providing jobs and maintaining rural social infrastructure (e.g. schools, health care, stores, and housing) (Anon, 2013; Matilainen, 2013). As a consequence of the Soviet Union's collapse and subsequent transitioning towards a market economy (Nordberg et al., 2013), forestry sector employment decreased dramatically because of the decline in the forest industry based on the socialistic principles of a planned economy (Naumov et al., 2017). At the time of this study, there were 12 private forest logging companies, Mondi Syktyvkar OJSC was the largest, and some small private entrepreneurs that leased forests and were responsible for forest management (Anon, 2013). In 2013, the official unemployment level in Kortkeros was >50% (Anon, 2013).

Table 1
Socio-economic context in the two case study areas (year 2012).

	Roztochya (Lviv region, Ukraine)	Kortkeros (Komi Republic, Russia)
Forest cover (%)	44	90
Population	59922	19200
Population density (persons/km^2)	80	1
Average monthly salary (Euro)	214	516
Average pension (Euro)	103	205
Forests ownership	State	State
Unemployment (%)	7	ca. 50

Roztochya (50°06′N - 49°06′N and 23°20′ E - 23°54′E) is located in the westernmost part of Ukraine and covered 992 km^2. Forests covered 44% of the area. Roztochya had 120 settlements with approximately 60,000 inhabitants (Table 1), and the population density was 80 persons per km^2 (Anon, 2014). Sulphur mining was the economic driver during the Soviet era and employed >20,000 people. In rural areas, collective agricultural farms were the main source of employment for local people. After the collapse of the Soviet Union, the mining industry closed, and agricultural farms went bankrupt. At the time of this study, there were eight state forest enterprises, one national nature park, and one strict nature reserve (Stryamets et al., 2015). State forestry enterprises were responsible for all forest operations, including wood processing, and were the main employers in the region. Small-scale private enterprises had emerged and employed a large part of the local population. The official level of unemployment was >7% (Table 1).

3.2. Analysis of institutional frameworks

Seventeen legal documents on forest resources (eight legal documents for Russia and nine for Ukraine) were used in the qualitative analysis. A content analysis that followed (Bryman, 2008) was undertaken to understand (i) ownership rights and access to NWFPs and their markets; (ii) issues related to sustainability of the resource; (iii) NWFPs' use; and (iv) decision-making processes related to production systems of NWFPs in each country (Table 2). As a global institution, the FSC forest certification standards were analysed in an NWFP context, and the engagement of different stakeholders in the decision-making process was observed.

3.3. Expert interviews

To obtain further information on the actual implementation of institutional frameworks and the involvement of the groups of stakeholders in their implementation, qualitative semi-structured interviews (Kvale, 2008; Kvale and Brinkmann, 2009) were carried out with

Table 2
Institutional rules related to NWFPs in Russia and Ukraine.

Institutions/Country	Komi Republic, Russia	Ukraine
National legal framework	Forest Code (2006, new edition 2018) Resolution of the Government of the Russian Federation on Red Book (1996) Federal Law on nature protection (2002) Recommendations on public hearing in Komi Republic (2009) Federal law on hunting and protecting of game species 2009, Federal law on animal world The Red Book of the Komi Republic (2009) The law on regulation of forest relations in Komi Republic (2006)	Forest Code (2006) Law on Red Book (2002) Law on nature protection (1991) Law on nature-protected fond (1992) Law on animal world of Ukraine (2001) Law on plant world of Ukraine (1999) Law on hunting organizations and hunting (2000) Resolutions of Cabinet Ministers (1996) Criminal Code of Ukraine (2002)
Global framework	National FSC standard	Interim FSC standard

stakeholders responsible for governance of forest resources in the study areas. The interviews were conducted in November 2013 (in Kortkeros) and June 2014 (in Roztochya) in the interviewees' native languages (Russian and Ukrainian, respectively). Forty-eight in-depth interviews were conducted: 16 in Kortkeros and 32 in Roztochya. Interviewees were identified using the snow-ball approach (Kvale and Brinkmann, 2009). All interviews were conducted by the first author in the Russian study area, and by the first and second authors in the Ukrainian study area. Interviews were conducted with managers of forest enterprises, heads of village councils, and representatives of forest companies; non-governmental organisations (NGOs); and regional and local authorities responsible for forest resources at the regional and local levels. The interviewees represented stakeholders from public (36 from both study areas), private (8), and civil sectors (4) at local, regional, and national levels. The respondents were given full freedom to talk about the subject. Interviews contained a mixture of open-ended questions and specific questions about NWFPs use and governance, including the importance of NWFPs for local livelihoods (Annex 1). Interviews lasted from 40 min up to 2 h, were digitally recorded, and then transcribed. The interviews were analysed using qualitative content analysis (Biernacki and Waldorf, 1981), and the main aim was to identify and analyse the governance/government systems related to sustainability and use of NWFPs and access to the resource and to markets in each country.

4. Results

4.1. Institutional frameworks

4.1.1. Legal frameworks

Basically, two different types of governance arrangements were recorded for NWFPs used for personal consumption and for commercial purposes, respectively. Regulations related to maintaining a sustainable supply and access to plant-based NWFPs for personal consumption were similar in Russia and Ukraine (Table 3). For example, extraction of nuts, mushrooms, berries, and other fruit and plant parts were free of charge and allowed in quantities to ensure timely recovery of plants and reproduction of raw biomass (Forest code of the Russian Federation, 2008).

Our analysis revealed significant differences between the two countries in regulations related to access of plant-based NWFPs for commercial extraction (Table 3). In Russia, commercial use of NWFPs was based on leasing forest land for specific purposes clearly defined by

Table 3
Comparison of the most important institutional rules for NWFPs in Russia and Ukraine.

Attribute of NWFPs	Komi Republic, Russia	Roztochya, Ukraine
Sustainability of NWFPs		
Collection Red Listed	Forbidden	Forbidden
Collecting endangered species	Forbidden	May be collected under strict guidelines in each region. For these, a special ticket for picking must be purchased from the forestry enterprise. There are strict regulation rules how much could be harvested
Harvesting of wild food	Be conducted without harm to forest resources, the starting dates of berries collection is restricted	Be conducted without harm to forest resources
Harvesting medical plants	Herbs of the annual plants is allowed to collect once in 2 year period, roots once in a 15-20 years period, and above-ground organs of perennials once in 4-6 years period. Recollection of raw medicinal plants in the same area is permitted only after full recovery of plant species. It is forbidden to pull plants with roots, to damage the leaves (buds) and rhizomes	Harvesting of plant parts and berries is allowed if the berries comprise more than 10% of the ground cover in the forest and the ground cover of medical herbs are more than 5% Less than 10% of roots and 40% of leaves from each plant are allowed to harvest
Collect plant and mushroom species that contain the narcotic drug substances	Forbidden	No information
Access to the resources		
Resin tapping	Leasing of the forests for resin tapping Rules for procurement of resin are established by an authorized federal executive body	The rules on resin tapping has 36 articles which describes the main statements and rules of resin tapping
Sap (for personal and for commercial purposes)	Special rules, free	Have to obtain special ticket, for each species and amount
Harvesting of wild food for commercial purposes	Have to lease forest lands min for 10 years	Have to obtain special ticket, for each species and amount
Harvesting medical plants for commercial purposes	Leasing of forest areas for medical herbs plantations	Have to obtain special ticket, for each species and amount
Hunting	The law on Hunting and protecting of game species has 68 articles which describes the main statements of hunting law	The law on Hunting and protecting of game species has 43 articles which describes the main statements of hunting law

the state forest management unit or by the forest leaser, usually a private forest company. We found rules that allowed plantations of medicinal herbs and berries in forests (Forest code of the Russian Federation, 2008). Individuals and private/public/civil organisations had the right to lease forest lands from the state to grow herbs and berries. Harvested wild food and medicinal plants were the property of a forest land leaser (Forest code of the Russian Federation, 2008). In Ukraine, extraction of NWFPs for commercial use was designated as the 'special use of NWFPs' (Forest Code of Ukraine, 2006). Commercial collection of NWFPs by a private person or a company required a special permit from the state forest enterprise (Forest Code of Ukraine, 2006). Revenue generated from permits went to the local community's budget. According to the Forest Code of Ukraine (2006), local people had to obtain a permit to harvest NWFPs from privately owned forests.

In both Russia and Ukraine several national laws and rules regulated the management requirements of animal-based NWFPs, including certain game species (Table 3). For example, hunting of particular species was allowed during certain seasons. Both countries had state, community, and private hunting organisations. These hunting organisations were responsible for the conservation of game resources and for organising hunting according to the law (Anon, 2000a; Forest Code of Ukraine, 2006). They also protected animals from illegal hunting and took care of game during the winter seasons. In both countries, poaching was illegal.

Regarding the access to markets, no restrictions were observed on access for local communities in the national legislations. Private persons and entrepreneurs had equal rights to sell NWFPs. The main obstacle that limited the access to markets for locals in both countries were badly developed transport infrastructure.

In addition to these institutional frameworks at the national level, regional legislation regulated the NWFPs' production system in Russia. There are 84 Federal Subjects, which have different levels of autonomy. The Komi Republic is a Federal Subject at the highest level and has its own constitution and parliament. Each Federal Subject may also implement its own legislation that does not oppose the federal laws. For example, the law on the Red Book of the Komi Republic (2009) included a specific rare species found in the Republic (Table 3) (Red Data Book of Komi Republic, 2009). Among the regional legal documents, regulations for the allocation of areas for gathering mushrooms and berries by the local population in the territory of the State Forest Fund (Anon, 2004) and recommendations on public hearings related to forest management and use in the Komi Republic (Recommendations on public hearings, 2004) were relevant for governance of NWFPs. These documents were developed through cooperation among governmental organisations, state forestry enterprises, and local communities and facilitated by the Komi Model Forest. Their appearance was triggered by conflicts between local people and forest leasers in the Komi Republic. The recommendations provided opportunities for local people to maintain their customary rights on access and use of NWFPs in forests leased by forest companies.

4.1.2. Forest certification standards

In addition to the national laws, forests in the Russian study area were managed according to the National FSC standard (FSC, 2012). An analysis of the FSC standard showed 17 criteria and 46 indicators (Table 4) that regulated the access, sustainable use, and maintenance of NWFPs. For example, indicator 5.5.9 required that forest management shall not diminish the accessibility of NWFPs to local communities. Indicator 2.2.3 also required that a company shall not violate legal or customary tenure or use rights of local communities to the forest resources, including NWFPs, when managing the forest. Indicators 6.2.7–6.2.9 and 6.2.13 directed that certified organisations were responsible for protection of main game species, key habitats, and rare species. Certified forests were required to allow mushroom and berry

Table 4
Analysis of FSC certification standards in Russia and Ukraine.

FSC certification standard	The Russian Federation national standard	Ukraine (International generic indicators)
Sustainability	Principle 1: Compliance with laws and FSC principles Criterion 1.3. In signatory countries, provisions of all binding international agreements such as CITES, ILO Conventions, ITTA, and Convention on Biological Diversity, shall be respected (Indicator 1.3.1) Criterion 1.5. Forest management areas should be protected from illegal harvesting, settlement and other unauthorized activities (Indicators 1.5.1 and 1.5.2) Principle 5: Benefits from the forest Criterion 5.3. Forest management should minimize waste associated with harvesting and on-site processing operations and avoid damage to other forest resources (Indicator 5.3.4) Criterion 5.4. Forest management should strive to strengthen and diversify the local economy, avoiding dependence on a single forest product (Indicators 5.4.1, 5.4.3) Criterion 5.5. Forest management operations shall recognize, maintain, and, where appropriate, enhance the value of forest services and resources such as watersheds and fisheries (Indicator 5.5.9) Criterion 5.6. The rates of harvest of forest products shall not exceed levels which can be permanently sustained (Indicators 5.6.3, 5.6.6) Principle 6: Environmental impact Criterion 6.2. Safeguards shall exist which protect rare, threatened and endangered species and their habitats (e.g. nesting and feeding areas). Conservation zones and protection areas shall be established, appropriate to the scale and intensity of forest management and the uniqueness of the affected re-sources. Inappropriate hunting, fishing, trapping and collecting shall be controlled (Indicators 6.2.9, 6.2.10, 6.2.13)	Principle 1: Compliance with laws Criterion 1.4 The Organization shall develop and implement measures, and/or shall engage with regulatory agencies, to systematically protect the Management Unit from unauthorized or illegal resource use, settlement and other illegal activities (Indicator 1.4.1). Principle 6: Environmental values and impacts Criterion 6.6 The Organization shall effectively maintain the continued existence of naturally occurring native species and genotypes, and prevent losses of biological diversity, especially through habitat management in the Management Unit. The Organization shall demonstrate that effective measures are in place to manage and control hunting, fishing, trapping and collecting. (Indicator 6.6.4)

Table 4 (*Continued*)

FSC certification standard	The Russian Federation national standard	Ukraine (International generic indicators)
Access to the resources	Principle 2: Tenure and use rights and responsibilities. Criterion 2.1. Clear evidence of long-term use rights to the land (e.g. land title, customary rights, or lease agreements) shall be demonstrated (Indicators 1.2.1-1.2.2) Criterion 2.2. Local communities with legal or customary tenure or use rights shall maintain control, to the extent necessary to protect their rights or resources, over forest operations unless they delegate control with free and informed consent to other agencies (Indicators 2.2.1 and 2.2.3) Principle 5: Benefits from the forest. Criterion 5.4. Forest management should strive to strengthen and diversify the local economy, avoiding dependence on a single forest product (Indicator 5.4.3) Principle 7: Management plan. Criterion 7.1. The management plan and supporting documents shall provide: a) Management objectives; b) Description of the forest resources to be managed, environmental limitations, land use and ownership status, socio-economic conditions, and a profile of adjacent lands; c) Description of silvicultural and/or other management system, based on the ecology of the forest in question and information gathered through resource inventories; d) Rationale for rate of annual harvest and species selection; e) Provisions for monitoring of forest growth and dynamics; f) Environmental safeguards based on environmental assessments; g) Plans for the identification and protection of rare, threatened and endangered species; h) Maps describing the forest resource base including protected areas, planned management activities and land ownership; i) Description and justification of harvesting techniques and equipment to be used (Indicator 7.1.1)	Principle 4: Community relations. Criterion 4.1 The Organization shall identify the local communities that exist within the Management Unit and those that are affected by management activities. The Organization shall then, through engagement with these local communities, identify their rights of tenure, their rights of access to and use of forest resources and ecosystem services, their customary rights and legal rights and obligations that apply within the Management Unit. (Indicator 4.1.2)
Access to markets	No information	No information

Protection of customary rights	Principle 2: Tenure and use rights and responsibilities. Criterion 2.2. Local communities with legal or customary tenure or use rights shall maintain control, to the extent necessary to protect their rights or resources, over forest operations unless they delegate control with free and informed consent to other agencies (Indicators 2.2.1 and 2.2.3) Principle 3: Indigenous peoples' rights. Criterion 3.1. Indigenous peoples shall control forest management on their lands and territories unless they delegate control with free and informed consent to other agencies (Indicators 3.1.1-3.1.9) Criterion 3.2. Forest management shall not threaten or diminish, either directly or indirectly, the resources or tenure rights of indigenous peoples (Indicators 3.2.1-3.2.3) Criterion 3.3. Sites of special cultural, ecological, economic or religious significance to indigenous peoples shall be clearly identified in cooperation with such peoples, and recognized and protected by forest managers (Indicators 3.3.1-3.3.7) Criterion 3.4. Indigenous peoples shall be compensated for the application of their traditional knowledge regarding the use of forest species or management systems in forest operations. This compensation shall be formally agreed upon with their free and informed consent before forest operations commence (Indicators 3.4.1-3.4.3)	Principle 3: Indigenous peoples' rights Criterion 3.1 The Organization shall identify the Indigenous Peoples that exist within the Management Unit or those that are affected by management activities. The Organization shall then, through engagement with these Indigenous Peoples, identify their rights of tenure, their rights of access to and use of forest resources and ecosystem services, their customary rights and legal rights and obligations, that apply within the Management Unit. The Organization shall also identify areas where these rights are contested. (Indicators 3.1.1-3.1.2) Criterion 3.2 The Organization shall recognize and uphold the legal and customary rights of Indigenous Peoples to maintain control over management activities within or related to the Management Unit to the extent necessary to protect their rights, resources and lands and territories. Delegation by Indigenous Peoples of control over management activities to third parties requires Free, Prior and Informed Consent. (Indicators 3.2.1-3.2.4) Criterion 3.3 In the event of delegation of control over management activities, a binding agreement between The Organization and the Indigenous Peoples shall be concluded through Free, Prior and Informed Consent. The agreement shall define its duration, provisions for renegotiation, renewal, termination, economic conditions and other terms and conditions. The agreement shall make provision for monitoring by Indigenous Peoples of The Organization's compliance with its terms and conditions. (Indicators 3.3.1-3.3.3) Criterion 3.4 The Organization shall recognize and uphold the rights, customs and culture of Indigenous Peoples as defined in the United Nations Declaration on the Rights of Indigenous Peoples (2007) and ILO Convention 169 (1989).(Indicators 3.4.1-3.4.2). Criterion 3.5 The Organization, through engagement with Indigenous Peoples, shall identify sites which are of special cultural, ecological, economic, religious or spiritual significance and for which these Indigenous Peoples hold legal or customary rights. These sites shall be recognized by The Organization and their management, and/or protection shall be agreed through engagement with these Indigenous Peoples. (Indicators 3.5.1.-3.5.3.) Criterion 3.6 The Organization shall uphold the right of Indigenous Peoples to protect and utilize their traditional knowledge and shall compensate local communities for the utilization of such knowledge and their intellectual property. A binding agreement as per Criterion 3.3 shall be concluded between The Organization and the Indigenous Peoples for such utilization through Free, Prior and Informed Consent before utilization takes place, and

picking, hunting, and recreation. Forest management should include collection of berries and mushrooms, hunting, and fishing among other long-term socio-economic benefits for local communities (Indicator 7.1.1). Locations where local communities traditionally collected berries and mushrooms, hunted, and fished were recognised as areas of a special value called high conservation value forests. In the FSC standard, the traditional use of natural resources was explained as a specific integrated system for management of natural resources and included animal husbandry, agriculture, hunting and trapping wildlife, and the use of NWFPs. These practices were of cultural importance for local communities in Komi. The FSC standard also stipulated the following: protection for traditional knowledge of nature resource use, and compensation for local communities for the application of their local knowledge (Indicators 3.4.1–3.4.3).

In Ukraine, a generic FSC standard was used to certify forest management because a specific National FSC standard had not been developed. Eleven criteria and 16 indicators in the generic standard concerned use of NWFPs. Criteria required that 1) the rights of local people to collect NWFPs had to be secured, 2) information on the use of NWFPs should be available and, 3) the multi-functional use of forest resources including hunting and NWFPs for traditional handicrafts should be maintained. An additional criterion focused on animal-based NWFPs and required the control of hunting in certified forests.

Currently, new National FSC standards are under development in both countries, which should be based on free, prior, and informed consent of indigenous people and local forest-dependent communities on forest operations. This creates a new opportunity for local communities and others to protect and maintain their rights in certified forests related to the access to and maintenance and use of NWFPs.

4.1.3. Customary institutions

In addition to the formal institutional frameworks, customary institutions may regulate the access to NWFPs. This case applies where forests are inhabited by indigenous people. Although, the Russian legislation does not recognise the Komi people as indigenous (Anon, 2000b). According to the interviews, the Komi people had strong customary institutions related to NWFPs. The access to and use of plant-based NWFPs had been maintained by the Komi people for centuries and was perceived as their customary rights. Additionally, other local forest-dependent communities perceived the access and use of plant-based NWFPs as their rights.

The main forester of the Kortkeros forestry enterprise summarised the situation, '*It is so-called "people's forests", which people are using for timber, firewood, and for collecting NWFPs. There are not so many villages; therefore, this social forest is only up to 5% of our territory. It is a very good way to prevent conflicts in the area.*' Furthermore, the Vice head of the Kortkeros region highlighted that the use of *NWFPs 'is essential for satisfying social needs in the Kortkeros region*'. Regarding animal-based NWFPs, the respondents highlighted that the Komi people had strong customary rights for hunting areas that had been passed down through generations. The local people knew locations of traditional hunting areas belonging unofficially to members of their communities and controlled the fulfilment of these customary rules.

In the Ukrainian case, customary institutions no longer existed. According to interviews, plant-based NWFPs were considered public good that belonged to everyone with free access and uncontrolled use. However, we observed a clear understanding that access, maintenance, and use of animal-based NWFPs were restricted and controlled by the state.

4.2. Stakeholder arrangements

4.2.1. Responsibilities of governmental organisations from the public sector

Russian Federation

Six national-level governmental organisations—two for plant-based NWFPs and four for animal-based NWFPs—were found to be responsible for sustainability of NWFPs (Tables 5 and 6). The Ministry of Natural Resources and Ecology of the Russian Federation developed public policy and regulations related to natural resources, including NWFPs. The Federal Agency of Forest Resources was responsible for the development and implementation of legislation related to maintenance of NWFPs and the access to these resources (Tables 5 and 6). Animal-based NWFPs, such as wild game, were a state resource, and the Federal Hunting department under the Ministry of Agriculture of the Russian Federation was responsible for game management. In addition, the control of hunting and game management was performed by the Ministry of Natural Resources and Ecology of the Russian Federation, the Federal Agency of Forest Resources and Federal Border Service of the Russian Federation, and their regional representatives (Table 6).

At the regional level, the Forest Committee of the Komi Republic was responsible for sustainable use of forest resources, including NWFPs. Within the Forest Committee, the Public Council was supposed to ensure communication among citizens, civil organisations, and the Forest Committee to consider the needs and interests of the stakeholders, to protect their rights and freedoms and the rights of public associations in the development and implementation of state forest policy. Regarding animal-based NWFPs, the Republican Society of Hunters and Fishermen was the biggest hunting association.

The state forest management units represented local-level state interests in forest resource use, including NWFPs. According to interviews with heads of state forest management units in Kortkeros, the consumption of NWFPs was vital for only rural residents. During the time of the Soviet Union, collection of NWFPs from forests was a critical part of the state forest enterprises' economy, which included collection of medical herbs, berries, and mushrooms. A respondent from one state forestry enterprise explained that 20 years ago, it dried and sold several tons of mushrooms, lingonberries, and blueberries per year.

According to the Director of Storozevsk, a forestry enterprise, '*During Soviet times, we were collecting a lot of different kinds of medical herbs, and we even had plantations of four different species of medical herbs. Nowadays, according to the law, we are not allowed to do anything concerning NWFPs, there are private companies that buy berries and mushrooms from local people.*'

A respondent from the regional administration explained, '[the] *Forestry sector is still critical for our region as it provides 40% of the employment. At the same time, NWFPs are a source of income for >20% of the local population. There are private companies that buy berries and mushrooms from the local population*'.

Ukraine

Eighteen public organisations at national, regional, and local levels were responsible for sustainability of NWFPs and regulations regarding access to these resources. At the national level, the Ministry of

Table 5
Decision-making process related to sustainability and extraction of plant-based NWFPs in Russia.

Main stakeholders	Reasons of interest	Reasons of influence
Ministry of Natural Resources and Ecology of the Russian Federation	Control the sustainable use of resources	Developing public policy and regulations
Federal Agency of Forest Resources	Development and implementation of legislation	Control use of natural resources
Forest Committee of the Komi Republic Public	Control sustainable use of forest resources Consider the interests of different stakeholders	Developing and implementation of state forest policy
Main Department of Natural Resources and Environmental Protection of the Komi Republic	Define the regional Red Listed species Nature protection	Coordinate of work of subordinate departments Control the use of natural resources
State forest enterprises	Control the use of plant-based NWFPs	Define the time and max volumes of collecting berries within the territory of enterprise
NGO' Silver Taiga'	Protection of interests of local people	"Recommendations through public hearings" "Recommendations on the use of berries and mushrooms"
Private business	Income through re-sale of NWFPs	Have little or no influence
Local people/ Local communities/The public	Wide range of NWFPs Additional income through selling of NWFPs	Little or no influence Can jointly influence through NGOs

Table 6
Decision-making process related to sustainability and extraction of animal-based NWFPs in Russia.

Main stakeholders	Reasons of interest	Reasons of influence
Ministry of Natural Resources and Ecology of the Russian Federation	Control of hunting and game management	Developing public policy and regulations
Federal Hunting department (under the Ministry of Agriculture of the Russian Federation)	Responsible for game management	Control hunting
Federal Agency of Forest Resources and Federal Border Service of the Russian Federation	Development and implementation of legislation	Protection of species Control the compliance to the law
Forest Committee of the Komi Republic Public	Control sustainable use of forest resources Consider the interests of different stakeholders	Developing and implementation of state forest policy
Council Republican Society of Hunters and Fishermen	Control hunting Game management and hunting	Issuing the licenses to hunt Protection of the rights and legitimate interests of the organization
Main Department of Natural Resources and Environmental Protection of the Komi Republic	Define the regional Red Listed species Define the amount and diversity of species	Issuing the limits of hunting species (amount and diversity).
State forest enterprises	Supporting game species	Have little or no influence
Hunting organizations	Game management and hunting	Have little influence
NGO' Silver Taiga' NGO' Komi Voityr'	Protection of interests of local people	Developed recommendations for traditional hunting areas
Local people/ Local communities/ The public	Customary hunting areas Customary hunting	Can jointly influence through NGOs

Ecology and Environment of Ukraine and State Agency of Forest Resources of Ukraine under the Ministry of Agrarian Policy and Food were responsible for NWFPs (Tables 7 and 8). The main functions of the Ministry of Ecology and Environment of Ukraine were to (1) be responsible for the management, restoration, and protection of all plant and animal species; (2) provide legal regulations related to the protection, use, and restoration of plant and animal species; (3) maintain the national assessment of game animals; (4) define limits on the use of wild animals and the collection of technical, medicinal, aromatic, and food raw materials from wild plants; and (5) develop the Red List of plant and animal species. The main responsibilities of State Agency of Forest Resources of Ukraine were to develop procedures for issuing permits for the use of forest resources, including NWFPs, and to control the compliance of the legislation on hunting(Red Data Book of Ukraine, 2009).

At the regional level, the Regional Department of Ministry Ecology and Environment of Ukraine approved the limits on use of NWFPs and controlled the compliance with the law on nature protection (State Agency of Forest Resources of Ukraine, 2016). Each Regional Agency of Forest Resources and Hunting controlled use of animal-based NWFPs. The Regional State Administration was responsible for approving limits on special uses of NWFPs and issuing prices for each NWFP type. The agency also was responsible for assigning the hunting areas proposed by the Regional Agency of Forest Resources and Hunting. If a private person or business wanted to extract plant-based NWFPs, they had to contact the state forestry enterprises to obtain a permit called a 'ticket for special use of NWFPs'. Each 'ticket' was issued for a specific type and amount of NWFPs to control and provide fair use of forest resources. Income from 'ticket' sales for extraction of NWFPs contributed to the local communities' budget. Prices for tickets were low; in 2013, the price for a "ticket" for 1 kg of blueberries was UAH 0.5 (less than USD 0.02), and the market price for 1 kg of blueberries was UAH 25–28 (approximately USD 3 at the time of the study). The full use of the limits for NWFPs in the Lviv region, in which Roztochya is located, could provide revenues of approximately 1 million UAH to the local budgets.

However, the practice of issuing 'tickets' to gain access to NWFPs almost did not exist in the case study area. According to the representatives of the Regional Agency of Forest Resources and Hunting, plant-based NWFPs were of little economic interest. One interviewee explained, '*This year there was only one entrepreneur who wanted to buy tickets for collecting blueberries. Local people collect NWFPs for*

Table 7
Decision-making process related to sustainability and extraction ofplant-based NWFPs in Ukraine.

Main stakeholders	Reasons of interest	Reasons of influence
Ministry of Ecology and Environment of Ukraine	Protection of plant and animal species Management and restoration	Define the Red listed species Define limits on the use of wild animals, the collection of technical, medicinal, aromatic, food raw materials from wild plants
State Agency of Forest Resources of Ukraine (under the Ministry of Agrarian Policy and Food)	Control the compliance of the legislation on use of NWFPs	Develop procedure to provide special permits on game species and plant NWFPs
Regional Department of Ministry Ecology and Environment of Ukraine	Control the compliance to the law Control the availability of NWFPs Approve the limits on use of NWFPs	Calculate the number of permits that should be issued
Regional Agency of Forest Resources and Hunting	Control use of NWFPs	Calculate the amount of NWFPs that could be used (number of tickets)
Regional State Administration, Permit Department' of Lviv City Council	Tax income from use of NWFPs	Tickets for special use of NWFPs
State forestry enterprises	Control the amount of NWFPs (availability and recovery of resources)	Sell tickets for use of plant-based NWFPs
Local people/ Local communities/ The public	Interested in wide range of NWFPs for different reasons Collection of berries and nuts Collection of mushrooms Collection of medical herbs	Individual have little or no influence Can influence jointly in NGOs

Table 8
Decision-making process related to sustainability and extraction of animal-based NWFPs in Ukraine.

Main stakeholders	Reasons of interest	Reasons of influence
Ministry of Ecology and Environment of Ukraine	Protection of plant and animal species Management and restoration	National assessment of game species Define the Red listed species Define limits on the use of wild animals, the collection of technical, medicinal, aromatic, food raw materials from wild plants
State Agency of Forest Resources of Ukraine (under the Ministry of Agrarian Policy and Food)	Control the compliance of the legislation on hunting	Develop procedure to provide special permits on game species and plant NWFPs
Regional Department of Ministry Ecology and Environment of Ukraine	Control the species diversity and richness	Calculate the number of permits that should be issued
Regional Agency of Forest Resources and Hunting	Assigning hunting areas Propose areas for hunting Control the number of species to hunt	Issue the number of permits to hunt
Regional State Administration, Permit Department' of Lviv City Council	Approve the limits on special use of NWFPs	
State forestry enterprises	Have responsibilities for game management	Control the game species Control hunting Control against poacher
State hunting organization	Hunting and game management	Control hunting
Private hunting organizations	Hunting and game management	Have little influence
Local people/ Local communities/ The public	Interested in wide range of NWFPs for different reasons Hunting Birdwatching	Individual have little influence Can influence jointly in NGOs

personal needs, and even if they sell collected NWFPs, they do not buy tickets for NWFPs extraction. The enterprises get permits for NWFPs only if they export NWFPs abroad'. Respondents also recognised the potential of NWFPs for economic development, especially as valuable export product. One interviewee explained, '*I believe that use of wild berries and mushrooms has great potential, because these are organic products and demand for those products will increase'*.

Regarding access for extraction of animal-based NWFPs, hunting areas were leased for at least 15 years, and the size of hunting areas had to be at least 3000 ha (Anon, 1992). Hunting organisations had to allocate at least 20% of the hunting area for protection and reproduction of game animals. The hunting areas were leased for free through 2014. Starting in 2015, a new law required payment for a hunting lease to the landowner (Anon, 2000a). However, according to the interviews, neither lease prices nor the mechanism for payment had been developed. The representative of the Military Hunters and Fishermen Association in Western Region of Ukraine explained: '*To establish of a hunting area of 3000 ha, many landowners and land users have to be interviewed and approve this decision, which makes it impossible from the beginning*'.

At the local level, the state forestry enterprises, as permanent forest users, were responsible for the protection of the NWFPs from illegal or harmful consumption. However, respondents claimed that these functions were difficult to fulfil. The representative of the state forest enterprise commented: '*We do not have enough staff to protect forest against illegal logging; so definitely, we are not able to control the use of NWFPs. People can harvest as much as they like, and these resources are renewable, so it will grow again*'. According to local people, the state forestry enterprises were not interested in extraction of NWFPs because of low market prices, lack of demand at the national and regional levels, and seasonal markets.

Interviews with the representatives of local village councils showed that plant-based NWFPs were vital to local people for income, food, and medicine. However, the interviewees reported that the number of local trade places (as they explained, the places where locals could sell their NWFPs in substantial amounts to big companies) or markets to sell wild products were insufficient. One local interviewee explained, *'If we had places for selling wild berries and mushroom as it was during the Soviet time, our village life would be much easier. Nowadays, we have to spend our time to bring NWFPs to markets in the closest cities. There are no entrepreneurs in the villages who are able to organise collecting points*.'

Regarding governance of animal-based NWFPs, two state hunter organisations were identified under the state forestry enterprises. A forestry enterprise director commented, *'Hunting is very cheap in Ukraine, compared with Poland where you have to pay 156 euro for one hunting day with a licence. In Ukraine, people are poor, and poaching is widespread. But I think that forestry enterprises should only do forestry and not hunting and other activities'*. Poaching was mentioned as a problem in the area.

The Roztochya case study area had two protected areas of national importance—Roztochya strict nature reserve and Yavorivskyy national nature park. According to the nature protection law (Anon, 2000a), collection of any type of NWFP was forbidden in strict nature reserves and in the core areas of national nature parks and was allowed only in the buffer and transition zones of national nature parks. According to the legal documents, the administration of the Yavorivskyy national nature park had to obtain permits for the collection of NWFPs from a number of public organisations, including the Ministry Ecology and Environment of Ukraine, State Agency of Forest Resources of Ukraine, Permit Department of Lviv City Council, and Regional State Administration. This procedure was obligatory and had to be done every year. According to the law, without those permits, the administration of Yavorivskyy national nature park was not allowed to collect any NWFPs. However, according to the interviews, NWFPs were not considered economically valuable resources by the national nature park administration. The representative of the national nature park's administration explained, '*We collected medical herbs for production of herbal tea last year. But the demand for those products is low, so we stopped doing it. If collecting points for NWFPs were organised, we would collect and sell NWFPs'*. The main problem was illegal hunting. Both the strict protected reserve and the national nature park had a security service, but these individuals did not protect the animals against poachers. *'We have a security service in the reserve, but sometimes we found poachers' traps. The poachers with the traps are the worst because it is hard to catch them'*, explained the director of the strictly protected reserve.

4.2.2. Involvement of private sector stakeholders in use and trade of NWFPs

Russian Federation

Two private companies purchased NWFPs from local people for trade. Respondents from the private company that purchased NWFPs from local forest-dependent communities explained that NWFPs were critical for their business and for locals. This private company exported NWFPs mostly to Germany, Latvia, and Lithuania. '*NWFPs are the only way to earn something in the area. About 12 000 people live here, and all of them are collecting NWFPs,*' stated a state forestry enterprise director. People used different NWFPs, including moss for insulation in buildings, medical herbs for personal consumption, and birch bark for handicrafts. Contrary to the Soviet era, no medical herbs were harvested in industrial volumes. However, according to the interviewees, the prices on NWFPs were unfair, and locals sold NWFPs only to local companies because they often did not have the means to transport NWFPs to other markets. Thus, the private companies were monopolists and controlled the prices on NWFPs.

Conflicts were observed between the logging companies and the local indigenous people related to harvesting of NWFPs. For example, we observed cases where logging activities destroyed places for traditional collection of NWFPs, especially for hunting. Notably, the director of a local forestry enterprise explained that the conflict had deeper roots, '*The conflict with Mondi is due to high unemployment and growing dissatisfaction of the economic situation in the region. During Soviet times there was a lot of timber harvesting in the area; so, people had jobs and were less dependent on NWFPs—there were no conflicts'*. According to a representative of the Mondi Syktyvkar OJSC Company, the FSC forest certification resulted in them cooperating with local stakeholders and negotiating conflicts. '*We are sending to each village council a map of the proposed forestry activity,'* explained the representative of Mondi Syktyvkar OJSC. '*During the council deputy meetings the maps have to be discussed and approved by village councils. Only after the approval is a forest company is able to harvest the forest*'. A respondent from the rayon administration asserted, '*Only large, certified companies discuss their plans with the village councils, and not all forest enterprises'*.

Hunting, mostly for meat, was popular in Kortkeros, where almost 90% of the local people were hunters according to the interviewees. '*There are villages that live on game meat and berries',* explained one of the directors of state forestry enterprises. During the Soviet times, hunting for different furs (e.g., hare, squirrel, fox, beaver) was popular. '*On weekends and vacations I earned 5 thousand roubles by selling fur of wild game, when the average salary was 120 roubles,*' explained one respondent. '*Now, bear hunting is popular because one can sell a fur for USD 1000, which corresponds to several months' salary'*, stressed the representative of the hunting organisation. The Komi people had long traditions of protection of their hunting areas, which they considered their customary rights. The '*Komi people have very old traditional ways of*

hunting, they know a lot of special secrets for good hunting. They hunt with traps and with weapons,' explained the representative of hunting organisation.

Ukraine

Private sector stakeholders used NWFPs in Roztochya and were not interested in being involved in the decision-making process related to extraction of plant NWFPs. '*I am using medical herbs for my patients, but I am not buying any tickets, this resource is free,'* commented the representative of a private company that collected medical herbs. The respondents from the private companies explained that they were buying NWFPs from local people; therefore, they were not involved directly in extraction of NWFPs from the forest.

Regarding animal-based NWFPs, two private hunting organisations were in Roztochya. The key problem according to the people interviewed was poaching. A respondent from a hunting association commented, '*The only way to combat poaching is to increase environmental awareness of people, to make them understand that poaching damages nature. However, there are poachers that generate their main income from selling game meat to fancy restaurants in the cities'*. A member of the private hunting organisation explained, '*One issue is that fines for poaching are too small. I would propose to confiscate the weapon from poachers - then it would be more effective.'* Additionally, wild animals had damaged gardens and crops of the local households, which created conflicts between local people and the hunting organisations. A respondent from the Military Hunters and Fishermen Association in Western Region of Ukraine explained that there was no mechanism to provide compensation to local households for damages created by wild animals.

4.2.3. Stakeholder participation from the civil sector

Russian Federation

The civil sector was represented by two NGOs (Silver Taiga and Komi Voityr) who had key roles in conflict resolutions related to NWFPs. *'Silver taiga NGO was used as an independent platform for a dialogue between local people and our company'*, explained the representative of Mondi Syktyvkar OJSC. The Komi Voityr represented the Komi people's interests. '*Indigenous Komi people have trapping sites that they have been using for several centuries. But they have no legal documents to protect their hunting places'*, explained the founder of Komi Voityr.

To solve conflicts regarding the access to the forest resources and their use, management, and governance, the Komi Model Forest was established in 2006. As a pilot project to protect the customary rights of local communities regarding the access to and use of NWFPs, ten villages were used to map all traditional hunting areas and trapping sites. '*We interviewed each hunter in the villages. It was difficult because the hunting areas and trapping sites were family secrets, so we got help from the local communities. Then, all traditional hunting areas were mapped, and Mondi agreed to not do clear-cuts in those areas. So, the conflict was solved,'* clarified the representative of Silver Taiga. As a result, Silver Taiga developed "Recommendations for public hearings" (Anon, 2002) and "Recommendations on the use of berries and mushrooms" (Anon, 2004) that were legitimised by the government of the Komi Republic and used by local communities to protect their rights, including customary rights, through decision-making processes related to forest management.

Ukraine

Civil sector stakeholders were represented by the NGO related to the Roztochya Biosphere Reserve (BR). A representative of the BR commented, *'Berries and mushrooms are vital to locals in forested villages. The demand for these products is increasing because people now think more about healthy products, and wild food is one of them. Especially young mothers want to have wild berries for their kids. So, we believe that the BR will set up a good example in sustainable use of NWFPs.'* The establishment of the BR was accompanied by conflicts with local people concerned about losing their free access to plant-based NWFPs within the BR (see also Elbakidze et al., 2013). '*Today, the administration of BR is trying to maintain and protect local ecological knowledge related to use of NWFPs as wild food and medicine and to increase public awareness about these forest products,'* commented the manager of Roztochya BR. Respondents from the civil sector discussed the role of NWFPs for local livelihoods, but no action was taken. Managers of the BR explained that poaching was the main problem of animal-based NWFPs. *'There is illegal hunting, which is why we cannot see the wildlife in the forest'*, the respondent explained. Both representatives of the civil sector in Roztochya highlighted that the punishment for poaching had to be increased and that environmental awareness of local people to be raised. '*We need to increase the ecological or environmental awareness of the people, and then the poaching would stop,'* the respondent from the civil sector explained.

5. Discussion

5.1. What do institutions regulate?

Our study demonstrated that institutions in Russia and Ukraine regulate the access to and sustainability of NWFPs. Multiple legal documents contained restrictions regarding extraction and sustainable use of NWFPs. No special law or policy on NWFPs was observed; instead all measures were included in legislation that regulated nature conservation and forest management. The legal measures related to access to plant- and animal-based NWFPs differed: free access to extract plant-based NWFPs for personal consumption and paid access for commercial harvest in both countries. However, according to respondents, free use of these resources was considered a traditional practice deeply embedded in the culture of Russia and Ukraine, respectively; thus, local trade of NWFPs was not perceived by locals as commercial use of the resources. Thus, plant-based NWFPs in both countries are perceived as public goods (Stryamets, 2016). Local communities continued to use these resources as natural and social assets vital to their livelihoods in both case studies, which is similar to many developing countries, especially in Eastern Europe and tropical countries (Ingram et al., 2014; Ros-Tonen and Kusters, 2011; Stryamets et al., 2015).

Additionally, our study demonstrated that despite the many measures in legal documents, no law enforcement has been conducted related to plant-based NWFPs by responsible governmental organisations in either of the case study areas; the only exception was the control of the harvest of NWFPs in protected areas. We assumed that the law enforcement related to the sustainability of and access to plant-based NWFPs might have a high cost, resulting in the uncontrolled use of these resources being more 'economically feasible'. Notably, several scholars have shown that governance of public goods might be challenged by collective-action problems, which occur when short-term private interests diverge from public values, interests, and intentions (Ostrom, 2015; Sandström et al., 2011).

By contrast, in both countries, we observed paid access to animal-based NWFPs, which was also controlled by governmental organisations at multiple levels. Therefore, a fee and other restrictions limit the access to these resources. Traditionally, private goods are viewed as being optimally managed by markets or private institutions (e.g., Vatn, 2005; Vining and Weimer, 2005). However, poaching was perceived as the main problem in both case study areas. Thus, there are governance challenges to sustaining animal-based NWFPs. Our study showed that the multiple governmental organisations responsible for animal-based NWFPs do not have the capacity or willingness to sustain these resources. Another reason might be that the legal framework for extraction of animal-based NWFPs was complex, relatively expensive, and lacked clarity. Simple and clear systems for issuing hunting permits could improve the governance of animal-based NWFPs (Laird et al., 2010). Additionally, the respondents blamed the problem of

poaching on what they considered to be the low environmental awareness of local people.

No legal measures were observed on the use and trade of NWFPs in both countries, including access to markets. One reason for this 'legislative gap' was that at the national level, the importance of NWFPs' contribution to national economies, livelihoods, food security, and health was unknown or underestimated. By contrast, at the local level, public organisations in both countries considered NWFPs an economically valuable resource that generated income and potentially could provide even more benefits for the livelihoods of local communities.

Our study identified that FSC forest certification as a civil–society-driven institution had the potential to maintain customary rights related to access and use of plant- and animal-based NWFPs. New requirements for FSC certification might strengthen the protection of the rights of indigenous and local communities if the negotiation processes at the national level in Russia and Ukraine result in their proposal (FSC, 2018). For example, obtaining free, prior, and informed consent (FPIC) of indigenous peoples and forest-dependent local communities before undertaking forestry operations on lands they legally or customarily own and/or use is an essential requirement in the new FSC Principles and Criteria for forest management. FPIC is the 'right for indigenous and local communities to protect themselves from significant impacts on the resources and territories for which they can make a justified claim of long and established use' (FSC, 2018). The literature has confirmed this finding (Laird et al., 2010; Ørebech et al., 2006), that is, effective natural resource regulations are built upon the relationship between existing customary and national laws and policies considering the existing context.

In general, we conclude that legal measures on NWFPs are complex, overlap, and are unclear, and these aspects represent a common concern for many countries (Laird et al., 2010). One reason for it was that in both Russia and Ukraine, the governments tended to overlook non-industrial forest use undertaken by marginal local communities, even if economic, social, and cultural values of NWFPs were relatively high for local and regional development. Additionally, NWFPs were complex forest resources that 'include a broad range of species with extremely different ecologies and cultural and livelihood roles, and equally diverse market chains, end products, and consumers' (Laird et al., 2010, p. 346). This complexity creates additional challenges for the development of comprehensive legislation to regulate all aspects of NWFPs' production systems.

5.2. Shift towards new governance arrangements

This study showed that the main stakeholders governing NWFPs are from ministries—and their divisions at regional and local levels—responsible for nature conservation and forestry in both Russia and Ukraine. Thus, NWFPs are rather a 'stepchild' of these two major directions of nature resource management and are considered either as secondary products in forest management or red-listed species under protection in protected area management. We observed a misfit between legal frameworks and forest companies' business policies with customary rights. This difference caused a shift to introduce new stakeholder arrangements related to NWFPs as a special type of resource in areas where NWFPs were heavily used both for subsistence and for generating household income by local communities. This phenomenon occurred in the Russian study area, where a conflict between the forest companies and local communities around customary rights related to the access and extraction of NWFPs in public forests led to the establishment a new stakeholder arrangement in the form of the Komi Model Forest (see Elbakidze et al., 2010). This resulted in the establishment of a legitimised procedure of public hearings developed through the partnership of multiple stakeholders in the Komi Model Forest. Forest companies used this procedure to address the customary rights and interests of local communities regarding NWFPs before performing logging operations. It was also legitimised by being included in the Russian National FSC standard (FSC, 2012).

In the Ukrainian case study, the extraction of plant-based NWFPs by locals did not conflict with the interests and needs of other stakeholders. According to interviews, forestry was not perceived by locals as an obstacle to harvesting NWFPs. All interested parties were able to harvest NWFPs in the necessary quantities at any time and in any place outside the protected areas. Therefore, no efforts from stakeholders to shift towards new forms of stakeholder arrangements related to NWFPs were observed. By contrast, stakeholders from the private sector preferred uncontrolled use of plant-based NWFPs. The dominant mind-set among local people was to 'mine' plant-based NWFPs, rather than to process the raw material and produce value-added products. Notably, conflicts may emerge if access to the resource is closed or permitted. In the Ukrainian case study, local communities resisted the establishment of the BR because of fears that that action might introduce new restrictions on local communities on the extraction of plant-based NWFPs (Elbakidze et al., 2013).

In summary, our study confirmed that for NWFP users in the subsistence and supplementary categories, the priority was access to resources and protection from competing claims by other users of the same resource (Stryamets, 2016; Stryamets et al., 2012). Shifts from government to governance can occur when NWFPs are characterised by a rivalry that might lead to overexploitation of NWFPs and their degradation or when forest use and management trigger conflict among the interests and values of forest companies and local communities highly dependent on NWFP resources (e.g. Sandström et al., 2011). Our results demonstrated the importance of customary institutions and forest certification in the regulation of the access to and sustainability and use of NWFPs that might lead to decentralisation of forest governance, as other studies have indicated (Agrawal et al., 2008; Ros-Tonen and Kusters, 2011).

However, decision-making on NWFPs is often reactive (Laird et al., 2010), attempting to respond to the conflict of resource use, often with high economic value for local livelihoods. For example, in Russia, there is an on-going discussion on payments for extracting plant-based NWFPs, which was triggered by conflicts between forest companies, large buyers of NWFPs, and local communities. The Ministry of Agriculture proposed a seasonal payment for commercial extraction of mushroom (RUB 6000, or approx. USD 100) per person per year, and for berries (RUB 4500, approx. USD 76). This proposal alarmed many stakeholders. Later, the Ministry of Agriculture changed the proposal such that only private commercial companies had to obtain a ticket to harvest berries and mushrooms. The new regulations were implemented in September 2018; thus, commercial pickers of mushrooms and berries can now lease forests for at least 10 years and pay taxes. The state authorities highlighted that the new regulations would not harm the local population, rather legalize the shadow market of berries and mushrooms. However, if locals can extract NWFPs in the "leased forests" and how the sustainability of NWFPs will be controlled remain unclear (Syshyna, 2018).

5.3. Governance of NWFPs in a broader context

This study demonstrates that the current legal frameworks in Russia and Ukraine have focused on NWFPs as wild products that can be collected in natural or semi-natural forests. Similar findings have been found mainly for tropical countries (Ingram et al., 2017; Ingram, 2014; Laird et al., 2010; Shackleton et al., 2011). Additionally, further intensification of forest management due to global market demands for different types of wood might trigger conflicts between local use of NWFPs and 'global' wood production, and new demands of the global society to increase areas for biodiversity conservation (e.g.

Aichi biodiversity targets, 2010) could also affect the power dynamics among forest stakeholders, increasing forest-dependent communities' concerns regarding losing access to NWFPs.

As our study also shows that governmental organisations responsible for law enforcement do not have the capacity or willingness to mediate new relations. In the context of countries in transition, such as Russia and Ukraine, with state property on forested lands, increasing demands for tangible and intangible forest products from multiple stakeholders creates insecurity for individuals who directly depend on NWFPs for their livelihoods (Elbakidze et al., 2013; Pieroni and Soukand, 2018; Stryamets, 2016). These changes have not been reflected in the legal measures regulating NWFPs to balance a wide range of objectives from the protection of species under threat, to distribute greater benefits to harvesters and producers, quality control, the generation of government revenues through taxation, and support for local businesses (Laird et al., 2010).

In Ukraine, with development of the private ownership of forests, new forms of NWFP governance might be implemented, such as in Poland (Bauer et al., 2004), where permission from the landowner must be obtained. Differentiation between approaches to regulate personal and commercial collection of plant-based NWFPs has also been discussed in a number of countries (Bauer et al., 2004; Laird et al., 2010), including Russia. Regarding animal-based NWFPs, social and cultural values related to locals' hunting practices must receive more attention in legal documents and decision-making processes at multiple levels (e.g., Fischer et al., 2013), such as the cultural importance of hunting in Sweden (Sandström et al., 2011) or the supplementary importance of hunting in African countries (Fischer et al., 2013; Ros-Tonen and Kusters, 2011; Shackleton et al., 2011). European countries have discussed more transparent permit mechanisms and local control of hunting (Mustin et al., 2011). Thus, there is an urgent need for more research on social innovations related to management, use, and governance of plant- and animal-based NWFPs in diverse contexts.

Thus, we argue that new governance arrangements can be established to empower local communities to find means to protect their rights related to access to use, management, and trade of NWFPs. Challenges in NWFPs governance may be overcome through stakeholder partnerships with increasing involvement of private and civil sector stakeholders, which is in line with the findings of Ros-Tonen and Kusters (2011). Landscape approach initiatives such as Model Forests and BRs may be used to solve governance concerns regarding natural resource use and governance in general (Angelstam et al., 2019a; Axelsson et al., 2011; Elbakidze et al., 2013; Sayer et al., 2013), and for NWFPs in particular. Sayer et al. (2013) and Angelstam et al. (2019b) highlighted that one of the key principles of the landscape approach is equal engagement of all stakeholders in the decision-making process. Additionally, Hahn et al. (2008) showed that engaging local stakeholders in the decision-making process can help achieve resilience in social-ecological systems. Thus, empowering local forest-dependent communities in the decision-making process supports the implementation of SFM policy, including governance of NWFPs as an integral component (Angelstam and Elbakidze, 2017; Laird et al., 2010; Wynberg and Laird, 2007).

6. Conclusions

Governance of NWFPs is challenging because they include many sub-categories with economic, social, cultural, and ecological importance for a diverse range of stakeholders. In times of societal crises, such as in countries in economic system transition, NWFPs provide critical support for rural livelihoods in forest-dependent communities. The legal frameworks related to NWFPs in Russia and Ukraine are complex, overlap, and are unclear and have a distinct difference between the legal requirements related to access to plant- and animal-based NWFPs. Governance challenges were observed related to the control of animal-based NWFPs and the absence of law enforcement related to the sustainability of and access to plant-based NWFPs. We argue that weak governance of NWFPs creates challenges to the sustainability of these resources. Governance of plant- and animal-based resources must fulfil stakeholders' demands in terms of access to and use and marketing of these resources to sustain the livelihoods of local residents. Landscape approach initiatives with place-based stakeholder collaboration that respects customary rights and considers local specific contexts should be used to prioritise polices and stakeholder involvement in the decision-making process related to plant- and animal- based NWFPs. Therefore, further research on the governance of NWFPs in the European context is necessary.**Acknowledgments** We thank all stakeholders and local people in the case study areas in Russia and Ukraine for sharing their knowledge on use and governance of NWFPs. Funding for this work was provided by the Swedish Ministry of Environment and research council FORMAS to Marine Elbakidze (grant number 2017-00826) and Per Angelstam (grant number 2011-1737, 2017: 1342). Thanks to Yevgenij Glog for supporting the field study and to two anonymous referees who provided extremely valuable comments that helped to improve considerably the article.

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