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Assessment of forest industries compliance to forest certification standards in northwestern Russia

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Academic dissertation

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ABSTRACT

Russian boreal forests (taiga) cover an area of over 800 million hectares, which accounts for 20 % of the global forest resource and 47 % of the total territory of the Russian Federation. Russian forests are faced with several pressing environmental, institutional, and economic challenges of which illegal logging is a major concern. Forest Certification (FC) is a voluntary, market-driven mechanism involving a third-party auditing service ("the certifier") where the quality of forest management and production practices are systematically assessed against a set of specific requirements ("standards") with the aim of informing end-users of the sustainability of the forests from which the wood originated. Currently, Russia has approximately 43 million hectares of forests under the Forest Stewardship Council (FSC) certification scheme, and the FSC has granted 235 forest management (FM) certificates and 796 chain of custody (COC) certificates. National and transnational timber companies in Russia largely shape and influence the forest certification process. This thesis investigated the perceptions of certified and non-certified companies towards FC, and to what degree the representatives of these companies agree with the benefits and barriers of the FC process in the Russian context. The timber tracking system and the Due Diligence System (DDS) employed by each company were analyzed to investigate their effectiveness in tracking and preventing illegal timber entering the timber supply chain of the company. Moreover, non-conformities (NCs) to FSC Principles during the period 2011–2015 were collected and analyzed to reveal the degree of severity (minor and/or major) as per the FSC principles, geographical location, and size of leased forest area.

The results of these interconnected studies showed that both certified and non-certified companies perceive FC as an economic initiative and as an opportunity for new markets. FC is seen to provide access to new markets and, thus, enables additional sales but also ensures legality of the timber and improves the company's image and competitiveness in foreign markets. The company's own tracking system and DDS appeared functional, but require further improvements to meet EU Timber Regulation requirements (**Article II**). Analyzes of the major and minor NCs in the Northwestern region and within the Russian Federation showed that the number of minor NCs have increased since 2011; from 221 to 363 incidents by 2015, which also coincides with the increase in the number of issued FSC certificates i.e. increased area under certification. The Republic of Karelia and the Arkhangelsk region had the highest recorded minor NCs, particularly for FSC Principle 6 "Environmental impact – to maintain or restore the ecosystem, its biodiversity, resources and landscapes". The results further indicated that the total number of identified NCs was highest for large-size leaseholders in the Northwestern region. However, in the Russian Federation as a whole the majority of minor and major NCs occurred with small-sized leaseholders (**Article III** and **Article IV**). The continuation of FC in Russia requires a wider involvement of the different stakeholders, e.g. logging operators, local authorities, auditing services inspectors, NGOs and local communities living in the nearby forests. Of particular importance is changing the current views and perceptions of certification among

timber companies from an economic expansion mechanism to one where ecological sustainability standards can be adopted and accommodated.

Keywords: Russian Federation, Northwestern federal district, Illegal logging, Forest Certification, FSC, Due Diligence System, non-conformities, Forest industries, Perceptions.

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Maxim Trishkin

Joensuu, April 2019

LIST OF ORIGINAL ARTICLES

The thesis consists of the following articles, which are referred to in the text by the Roman numerals **I–IV**. **Articles I–IV** are reproduced with a solicited permission from publishers.

I. Trishkin M., Lopatin E., Karjalainen T. (2014) Assessment of motivation and attitudes of forest industry companies toward forest certification in northwestern Russia. Scandinavian Journal of Forest Research 29:3; 283–293. http://dx.doi.org/10.1080/02827581.2014.896938

II. Trishkin M., Lopatin E., Karjalainen T. (2015) Exploratory Assessment of a Company's Due Diligence System against the EU Timber Regulation: A Case Study from Northwestern Russia. Forests 6:4; 1380-1396. http://dx.doi.org/10.3390/f6041380

III. Trishkin M., Karjalainen T., Kangas J. An analysis of non-conformities of certified companies operating in northwestern Russia. Manuscript. Submitted to Forests MDPI.

IV. Trishkin M., Kolosovskaya T., Karjalainen T., Kangas J. An exploratory analysis of non-conformities of certified forest companies operating in Russia. Manuscript. Submitted to Journal of Forest Science.

Contribution of the authors

The author (Maxim Trishkin) had the main role in data collection, participation in the field audits, writing the first drafts of the manuscripts, and handled the submission logistics and communications with the journals. Prof. Timo Karjalainen was the main supervisor and helped set up the general framework of the thesis and assisted in establishing the study objectives and the methodological approach. He commented on earlier drafts of the manuscripts and provided feedback for improvements. Prof. Jyrki Kangas agreed to be the main supervisor at the final stage of the work due to sudden death of Prof. Timo Karjalainen. He provided valuable comments and suggestions. Prof. Alexander Alekseev and Dr. Eugene Lopatin provided general assistance. Tatiana Kolosovskaya provided comments and feedback on **Article IV**.

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LIST OF ABBREVIATIONS

CAR- Corrective Action Request
CB - Certification Body
COC - Chain-of-Custody
CW - Controlled Wood
CSR- Corporate Social Responsibility
DDS- Due Diligence System
EIC - East India Company
ENGO - Environmental Non-Governmental Organization
EU - European Union
EUTR- EU Timber Regulation
FAO- Food and Agriculture Organization
FC-Forest Certification
FCRF- World Bank's Forest Carbon Partnership Facility
FD - Federal District
FLEGT- EU Forest Law Enforcement, Governance and Trade
FM/COC - Forest Management/Chain-of-Custody
FMO - Forest Management Organization
FMU - Forest Management Unit
FSC - Forest Stewardship Council
GIS – Geographical Information System
HCVF - High Conservation Value Forests
IEA- International Energy Agency
IFLs- Intact Forest Landscapes
ITTO – International Tropical Timber Organization
MP - Management Plan
NC - Non-conformity
NGOs - Non-Governmental Organization
PEFC - Programme for Endorsement of Forest Certification Schemes
PMF – Priluzye Model Forest
REDD- Reducing Emissions from Deforestation and Forest Degradation
RF - Russian Federation
SFM - Sustainable Forest Management
SPFA – Strictly Protected Forest Areas
SPSS - Statistical Package for Social Sciences
WTO- World Trade Organization
WWF - Worldwide Fund for Nature

1 INTRODUCTION

In the past decades, several emerging trends and challenges have dramatically influenced the global vision of forest resources and the perceived values and effects of traditional forest management practices. In addition to direct carbon sequestration, forests are increasingly conceived to contribute to galvanizing energy security and independence efforts, supporting bioeconomy development strategies, and meeting the renewable energy and bioenergy targets of the European Union (EU) (IEA Nordic Energy Technology Perspectives 2012; Pelkonen et al. 2014). Although global forests currently act as a carbon sink, capturing about 9 % of total global emissions (Pan et al. 2011), the rate of forest cover loss due to deforestation (forest conversion to agriculture and plantations), large scale fires, illegal logging, mining, and oil and gas development (Russian Federation) is a major problem and posits serious concerns as to the future of forests and their essential biofunctions (FAO 2012; WWF 2015; World Resources Institute 2016; FAO 2018). For instance, global tree cover loss (natural forests and plantations) exhibited a record loss of about 30 million hectares in 2016 (equivalent to the size of New Zealand), 51 % higher than the previous year (WRI 2016). In the summer of 2018, large fires caused by the exceptionally hot and dry summer, claimed thousands of hectares of forest in Greece, Sweden and the United States. Large forest fires in recent years have also occurred in Canada and Russia. These challenges come at the crossroads of increasing timber extraction and biodiversity conservation.

The excessive rate of global deforestation and illegal logging calls for urgent efforts to create a framework of international collaboration to find solutions to these pressing challenges under global trade and cooperation (Bettinger et al. 2017). Since the early 1990s, several major policy movements have taken place. The United Nations Conference on Environment and Development (UNCED) (aka. Earth Summit in Rio de Janeiro) was followed by The Montréal Process and continued with FOREST EUROPE (Ministerial Conference on the Protection of Forests in Europe, aka. the Helsinki Process for Europe until 2009) and the formation of the International Tropical Timber Organization (ITTO) (Bettinger et al. 2017). Amongst other targets, these policy frameworks aimed at the conservation of forest ecosystems and the maintenance of their production capacity, as well as their contribution to the carbon cycle (Bettinger et al. 2017). However, these inter-governmental measures appear insufficient and ineffective to combat illegal logging in developing countries where weak forest governance has resulted in excessive forest clearance (conversion to agriculture) and illegal logging under complicit government interference (Ramage et al. 2017). In order to foster sustainable forest management in the global forest biome and to fight illegal logging in developing countries, several action plans and policy frameworks have been adopted and implemented though bi- or multi-lateral agreements and regulations, such as the EU Forest Law Enforcement, Governance and Trade (FLEGT) Action Plan with the aim to improve forest governance and to promote legally and sustainably produced timber. To support this initiative, the Timber Regulation (EUTR) (Regulation (EU) No 995/2010) was adopted by the EU in 2010, and came into force in 2013. This legislative instrument was adopted to "*address the global problem of illegal logging by acting on the side of the demand for timber and timber products*" as part of broader EU response to "*the pervasive problem of illegal logging and its devastating impact on forests*" (EU, 2015, executive summary pp.2). Other mechanisms include the World Bank's Forest Carbon Partnership Facility (FCRF) and the UN-REDD program,

which monitor and verify voluntary national efforts to reduce emissions from deforestation and forest degradation (FCRF 2015). In order to effectively support these international efforts, a number of key wood-importing countries have adopted national action plans to combat illegal logging by adopting stringent trade and labelling regulations but also by incentivizing legal compliance, such as the US Lacey Act 2008 (Section 8204), Japan's Green Purchasing Policy 2007, and Australia's Illegal Logging Prohibition Act (Ulybina and Fennell 2013; McDermott et al. 2015). Another prominent and transformational tool to tackle illegal logging and biodiversity loss by promoting responsible and sustainable forest management practices is the widely known Forest Certification (FC) scheme (Johansson and Lidestav 2011; Lewis and Davis 2015; Jaung et al. 2016; Kalonga et al. 2016). Adopted in the early 1990s, it is a voluntary, market-driven mechanism that involves third-party auditing of wood products. The basic premise of such a non-state governance mechanism is to systematically track wood from responsibly and sustainably managed forests to green-minded end-users, who demand wood products from sustainably and responsibly managed forests. Currently, the two most prominent global certification mechanisms are the Forest Stewardship Council (FSC) with 195 million hectares certified under this scheme (FSC 2019) and the Programme for Endorsement of Forest Certification (PEFC) covering 308 million hectares of certified forest areas (PEFC 2018). At the same time, nearly 70 million hectares of forests globally are covered by both certification schemes or overlap (FSC and PEFC 2017). Thus, 430 million hectares globally are covered by certification. Both certification schemes in total account for almost one fifth of the world's productive and multiple-use forests.

It is largely believed that the failure of the international community to develop a common-ground approach to tackle the issue of deforestation and forest degradation because of illegal logging was a key element in the creation of the FC schemes (Hackett 2013). Moreover, pressure from environmentally conscious consumers, driven by the rise of social and environmental activism orchestrated by prominent NGOs, created a political shift from government to governance with non-state stakeholders actively participating in the decision-making processes (Hackett 2013). Other drivers for the adoption of FC were economic globalization and multilateral trade agreements, such as the World Trade Organization (WTO), which facilitate the flow of multi-billions worth of goods and commodities between countries and continents (Tian et al. 2018). These new forms of economic neoliberalism and Western-led capitalism created new lucrative international markets that are open for competition, driven by supply and demand, and allow the creation of multinational and transnational companies that operate in several countries. Due to these trends in global markets and social transformation, FC has spread rapidly, and arguably, in countries with advanced forest management standards and low institutional and regulatory complexities, such as the boreal forests in Europe and North America (Siry et al. 2005; Cashore et al. 2006; Pena-Claros et al. 2009; Johansson and Lidestav 2011; Lewis and Davis 2015). However, the two certification mechanisms are fundamentally different, and their adoption depends on the various economic and political circumstances found in the host country. For example, it is believed that the FSC-standard was tailored towards large-scale forest companies by prioritizing the economic, social and environmental interests of different stakeholders (Cashore et al. 2004; Johansson and Lidestav 2011). It is argued that the PEFC mechanism, on the other hand, has been founded to accommodate and materialize the economic interests of small-scale private forest owners (Cashore et al. 2004; Johansson and Lidestav 2011). It operates by endorsing nationally designed FC standards and practices, such as the Chilean CERTFOR scheme and the Malaysian Timber Certification

Scheme. With nearly 500 % growth during the past decade and over 300 million hectares of certified forests, the PEFC scheme continues to gain traction worldwide and has surpassed the area certified by the FSC scheme (about 190 million hectares) (Lewis and Davis 2015).

There are three types of FSC certificates: Forest Management (FM), Chain-Of-Custody (COC) and Controlled Wood (CW). An explanation of each certificate type is presented in Table 1. The process of certification involves the participation of several actors and stakeholders, such as NGOs, local communities, timber companies and national and regional authorities. The process of issuing a certificate, however, is the responsibility of the Forest Management Organization (FMO) and a third-party auditing body called the Certification Body (CB). The latter can be a profit-oriented company or a non-profit organization. The CB issues the verification of compliance to the certification scheme and is accredited by Accreditation Services International (ASI) (ASI 2017; FSC 2017). Besides issuing the certificate, the CB has the authority to suspend or withdraw a certificate. The pre-assessment process is implemented to assist the FMO in identifying challenging issues related to certification; for example, where High Conservation Value Forests (HCVF) and Intact Forest Landscapes (IFLs) areas are involved, or where there is a risk of social dispute arising during the certification process (Tysianchniouk 2006). The CB is responsible for conducting the main assessment by checking the criteria and indictors of the FSC standards, and the process may involve field visits, the review of documents and the conduction of interviews during the audit period. During this process, auditors are required to verify the degree and severity of non-conformities (NCs) that may occur (Nussbaum et al. 2002). The NCs can have different severities – minor or major. The minor NCs have limited impact in time and space and major NCs are regarded as being non-compliant with the FSC standards and require further action from the client. The CB makes the final decision after reviewing comments and feedback from observers and other stakeholders. If a certificate is issued, four audits are carried out during the five-year validity period of the certificate. If NCs are identified during the auditing intervals, the CB submits a Corrective Action Request (CAR), where clients are requested to amend the NCs within a specified period of time. In cases where the NCs are not addressed, a verdict of certificate suspension or termination would take place. Moreover, geographical location, size of the timber company, the role of Environmental NGOs (ENGO), and size of leased area play influential roles in the frequency and severity of the NCs. For example, companies in the Northwestern region perceive FC differently to their counterparts in the Far East region of Russia. Currently, much of the debate around FC in Russia revolves around issues related to Principle 9 “high conservation value forests” (HCVF), Principles 3 and 4 which account for local communities’ rights and activities that impact their livelihoods, such as employment, access to fuelwood and infrastructures (Matilainen 2013; Ulybina 2013; Tysiachniouk and McDermott 2016).

Table 1. Types of Forest Stewardship Council (FSC) certificates (FSC 2017).

Types of certificate	Description
Forest Management certification (FM)	Is awarded to forest managers or owners whose management practices meet the requirements of FSC Principles and Criteria.
Chain of Custody (COC)	Applies to manufacturers, processors and traders of FSC certified forest products. It verifies FSC certified material and products along the production chain.
Controlled Wood (CW)	Is designed to allow organizations to avoid categories of wood considered unacceptable. FSC Controlled Wood shall only be mixed with FSC certified wood in labeled FSC Mix products.

1.1 The Russian forest sector: importance and challenges

With over 800 million hectares, Russian boreal forests (aka. Taiga) account for 20 % of the global forest resources and 47 % of the total territory of the Russian Federation (FAO 2014). The Taiga accommodates more that 55 % of the world's boreal biomass (WWF 2016). However, the enormous forest resource makes an inconsequential contribution (1.3 %) to Russian gross domestic product and to the global forest product trade (~ 4 %) (Proskurina et al., 2018). The Taiga is perceived to contribute quintessential environmental and economic benefits at the national and global levels, however, new visions for sustainable management are required (FAO 2014). For instance, the Russian boreal forest hemisphere accounts for over 50 % of the Northern terrestrial carbon stock (WWF 2016). Yet, Russian forests are threatened by several serious environmental, institutional and socio-economic factors that need to be addressed and tackled in order to preserve productivity and the natural floral and faunal diversity of the forests. These challenges include illegal logging, heat waves and forest fires, coal mining, oil and gas exploration and development, a lack of a well-developed forest infrastructure, and over-maturation and high mortality rates of forest stands in some regions, such as the Far East (Sikkema et al. 2014; LesOnline 2016; Proskurina et al. 2018). Climate change and extreme weather events cause severe fire damages with an average loss between 5 to 6 million hectares annually, i.e. more than 2 million hectares of forest devastated per year (Schepaschenko et al. 2015). The 2003 forest fire in Siberia is said to have destroyed millions of hectares of forests, and the 2016 Amur region fire claimed 2900 hectares in a single day. The fires are mainly caused by the careless behavior of the general public (Earth Observatory 2003; The Guardian 2005; Novaya Gazeta 2016). Extreme weather events may also further intensify global climate change, particularly if 70 billion tonnes of methane is released to the atmosphere from the Arctic shelf (The Siberian Times 2015; Chuvilin et al. 2019).

Illegal logging and the illicit trading of illegal wood products are among the most pressing environmental, social, and economic challenges confronting the Russian forest sector (FAO 2012, p 57). For instance, 40 % of the global roundwood production and trade is from illegal logging (WWF 2014). In the Russian Federation, illegal logging of rare/endangered species, logging in protected areas, falsified commercial logging by companies and/or individuals corresponds to approximately 2 million cubic meters annually as per the Rosleshoz data (official reporting), and around 35–40 million cubic meters (or

20 % of the total timber harvested) as per assessments made by WWF Russia and World Bank (WWF 2007; FAO 2012). In Russian Federation regions in juxtaposition to China, such as Primorsky Krai and Irkutsk Region, up to 50 % of the harvested timber may be of illegal or "doubtful origin" (FAO 2012; WWF 2013). The main drivers of illegal logging and trade in the Russian Federation have stemmed from the increasing demand for wood (finished and semi-finished products) regardless of the origin, corruption and low living standards in rural areas, and institutional and political weakness, such as a lack of transparency and public trust (World Bank 2011; FAO 2012; Pappila 2013; Ulybina and Fennell 2013). Aside from the environmental damage caused by illegal logging, the economic losses are estimated at one billion US dollars per year or up to 30–40 billion rubles. At the region-level, illegal logging and trade is more pronounced in the Far East region compared to the northwestern region, for instance. According to WWF and FSC Russia, "illegal logging" accounts for 80 % of the total volume in regions bordering China (Smirnov et al. 2013). Experts from WWF and the World Bank foresee a 5–80 % reduction in illegal logging turnover in Russia by 2030, depending on the scenario applied (FAO 2012).

In some cases, "gray" illegal logging is practiced by leaseholders who produce legal documentation but at the same time manipulate forest inventory plans to covertly violate the lease (Henry and Tysiachniouk 2018). Moreover, weak law enforcement leads to illegal logging supported by governmental officials through bribes from loggers, few or light punishments, or attempts to resell timber that had been seized as illegally harvested (Vandergert and Newell 2003; Smirnov et al. 2013; Henry and Tysiachniouk 2018). Henry and Tysiachniouk (2018) argue that due to illegal logging activities, some companies, particularly in the Far East, are wealthier than their counterparts in the Northwestern region and may use extra financial resources to influence the institutions and regulations related to FC in order to promote their interests through the creation of an industrial-led alliance with regional governments. The EUTR prohibits illegally logged timber on the EU market; EU operators must exercise a Due Diligence System (DDS) and maintain an up-to-date record system for suppliers and customers. Aside from the EUTR, the Russian government introduced Federal Law 415 in December 2013, which regulates wood trading outside of forests, and requires accounting of the total volume of logged roundwood (Shmatkov 2011; Federal Law 415 2013).

Between the Soviet era and the post-Soviet period, the Russian forest policy landscape went through major changes in order to enhance decentralization of the forestry sector and to follow the international standards and regulations. The 1997 "Forest Code", for instance, transferred several forest management functions to the jurisdiction of 83 federal districts and simultaneously kept legislative and monitoring functions with the federal government (Federal Law 1997). Progressively, Federal Law no.122 (2004), and the subsequent Acting Forest Code (Federal Law 2006) have both aimed at further decentralization and the transfer of future supervisory and monitoring functions to federal authorities. The leasing of forests was introduced through the "Basic Forestry Legislation" of the Russian Federation in 1993 (FAO 2012). The development of a set of national principles for sustainable forest management (SFM) had commenced by 1999 and resulted in the adoption of the Russian National Standard; a key document that describes SFM practices on an indicator-level tailored to Russian conditions. The sustainability principles and criteria are similar to the generic FSC version and have been adopted by the Russian FSC Accreditation Committee (Karpachevskiy et al. 2009). The entry of FC to the Russian Federation has also introduced

more regulatory changes to Russian forest policies, which are briefly described in the following section along with a description of the FC process in the Russian Federation.

The recent Forest Code of the Russian Federation (2006) is considered a contentious and perplexing law (Ulybina 2013). Despite its reforming efforts to fight corruption, a number studies have posited that the new code favors large companies and fails to accommodate the needs of local communities, instead leading to new corruption practices (Ulybina 2013; Tysiachniouk and McDermott 2016). Furthermore, WWF Russia have also identified that the Code appears weak in specifying mechanisms to maintain the ecological stability of the forest and biodiversity protection. Noticeably, the Code has failed to address disputes over forests between the state and local communities, resulting in more frequent illegal logging activities. Moreover, the Code was developed at a time when FC had the leading market position in the country and it does not acknowledge its importance and means for harmonization (Ulybina 2013).

1.2 Forest sector of the Northwestern Federal District

The total forest area in the Northwestern Federal District (FD) of Russia is 117 million hectares with a gross annual increment of 130 million hectares (Karvinen et al. 2011). The region accounts for 10 % of the total forest area in Russia (FSSRF 2019). More than half of forest resources in the region are located in two regions - the Republic of Komi (2.7 billion m^3) and the Arkhangelsk region (3.06 billion m^3) (Karvinen et al. 2011). Based on the designated function, "productive/exploitable forests" designated for commercial use and "protected forests" differ greatly in the Northwestern FD. For example, the highest proportion of production forests exists in the Vologda region (87 %) followed by the Republic of Karelia (79 %) and the Pskov region (77 %), whilst the highest proportion of protected forests exists in the Murmansk (64 %) and Leningrad regions (48%) (Forests in Russia 2010). Moreover, regions with the greatest commercial use of forests, such as the Vologda region, the Arkhangelsk region and the Republic of Komi, also have the highest proportion of mature and over-mature forests stands.

According to the Federal Statistical Service of the Russian Federation (2019), the proportion of the actual cut in the Northwestern FD is about 25% of the total actual cut of the Russian Federation or equal to 60 million m^3 annually. Thus, the Northwestern FD is important in terms of a stable wood supply, especially for the wood processing units located in the European part of Russia, as well as for export to EU countries. Moreover, over 80 % of harvesting operations in the Northwestern FD are done by forest leaseholders (Strategy for Development of Forest Complex in Russian Federation until 2030, 2018).

Key issues related to forest utilization in the Northwestern FD revolve around the availability and quality of forest infrastructure, which is essential for forest harvesting operations and timber transportation, thus largely determining economic accessibility to forests. Moreover, due to intensive cuttings (more commonly known as "wood mining") in the 1920s-1930s and later in the post-World War II period, forest composition in the regions has drastically changed toward an increased proportion of deciduous species in the boreal belt due to insufficient reforestation (Naumov 2014). Aside from forest utilization, the Northwestern FD is important in terms of sustainable forest management practices and

the effective protection of intact forest landscapes. A clear example is the Priluzye model forest (PMF), which was established in the Komi Republic in 1999 with an area of 0.8 million hectares. The main purpose of PMF is to establish sustainable forest management practices and disseminate gained experience to interested stakeholders. The PMF is composed partly from lands in the Pechoro-Ilych nature reserve in the Ural mountains and partly from lands surrounded by productive forests (Forest Trends 2008). The PMF concept was carried out by the Silver Taiga foundation and is recognized as a successful approach both within Russia and outside the country (Komiinform 2008).

1.3 Recent studies on forest certification

A comprehensive EU-level survey in relation to attitudes, expectations and preferences among forest owners, forestry industrial companies and traders towards FC was published by Rametsteiner et al. (1998). In recent years, the breadth of FC-related research has been extensive and intensive. Despite positive observations from scholars, criticism by small forest owners, in particular, has been directed at the low level of knowledge and awareness of the FC process and standards by local authorities and forest owners, the high cost of certification, and the stringent requirements for forest managers (Jaung et al. 2016; Tian et al. 2018). Other studies suggest that FSC has limitations in addressing the complex nature of measuring and monitoring biodiversity (Meijaard et al. 2014; Jaung et al. 2016), and PEFC has been criticized for prioritizing economic gains over environmental concerns (Johansson and Lidestav 2011). It was also noted that that the same standards may be verified differently by different auditors, when identifying the differences from both certified and non-certified areas (Rametsteiner and Simula 2003; Johansson and Lidestav 2011). Recent debate has also suggested that the certification schemes downgrade the role of public institutions and governments in managing natural resources; the FC schemes are used as a political tool by NGOs to impose rules on national forest standards or timber companies (Hackett 2013; Ulybina and Fennell 2013; Henry and Tysiachniouk 2018).

To garner insights on the environmental and socio-economic impacts of FC, I present in this thesis, the most recent findings from country-specific studies. In China, landowners in Shandong province appeared unfamiliar with the FC schemes, although they showed a willingness to consider participation provided sufficient information (cost and benefits) was provided through appropriate outreach and extension services (Tian et al. 2018). The authors also highlighted the costs of FC and third-party involvement as major barriers for landowners considering the FC option. In Sweden, a study using three different types of datasets showed that certification led to more harvesting activities on certified small-scale forest properties than on non-certified properties (Johansson and Lidestav 2011). The same study also found that FC has led to minor improvements in ecological conditions on large-scale FSC certified forests and on PEFC certified small-scale private forest properties. The authors questioned the commonly held assumption that compliance to certification standards may eventually lead to favorable/positive impacts on environmental forest conditions (Johansson and Lidestav 2011). In Ethiopia, Mitiku et al. (2018) found that Rainforest Alliance certification of semi-forest coffee generates higher profits for landowners and labor than non-certified semi-forest and garden coffee, mainly by guaranteeing farmers a better market price. In Mexico, a study that used forest management data offered no concrete evidence that FSC certification affects deforestation. However, the

study emphasized the distinct characteristics of FSC certified forest management units (FMUs); they are larger, offer non-timber products, accommodate carbon-rich forests and are located away from protected areas. Therefore, they concluded that FSC certification has positive ecological implications in Mexico (Blackman et al. 2018).

In Tanzania, Kalonga and Kulindwa (2017) studied the impacts of FC and reported that average household forest income from FSC-certified forests was significantly higher compared to non-certified forests. The study also reported better forest governance and law compliance in regions with FSC certification. The authors supported the premise that incorporating FSC standards may elevate livelihood conditions. Moreover, Kalonga and Klanderud (2016) indicated that certification has improved the ecological conditions in Tanzanian forests (higher species richness and diversity) and in certified community forests compared to open-access and state forest reserves. Thus, they affirm the concept that the certification mechanism is a good management tool for biodiversity conservation. In a global oriented study, 188 forest owners with FSC forest management certification from 57 countries were surveyed through email invitation (Jaung et al. 2016). The study highlighted the positive impacts of certification on forest ecosystem services, capacity building, and lucrative market reach. However, in both United States and China, there were clear barriers to the further expansion of FC; low willingness to pay for the costs incurred by the certification process and the limited market for forest ecosystem services. In Brazilian Amazon forests, McDermott et al. (2015) found that certification favors large producers with external markets and that certification has had limited socio-economic benefits at the local level.

In Malaysia, Lewis and Davis (2015) analyzed the PEFC-endorsed Malaysian Timber Certification Scheme and found that certification, with regular assessment intervals, leads to significant improvements within the FMUs over a relatively short time. However, the study emphasized the difficulties associated with compliance with the ecologically focused certification criteria compared to the economic and social criteria. The authors also highlighted the role of increasing institutional capacity and experiences in resolving non-compliance issues effectively. In Cameroon, Cerutti et al. (2011) suggested that uniform and transparent national FSC standards with clear rules on timber harvesting are required to strengthen the role of certifying bodies in their negotiations with the logging companies on determining the annual allowable cut. However, the authors pinpointed the role of certification in improving the institutional frameworks that had previously allowed unsustainable forestry practices.

In Vietnam, Maraseni et al. (2017) found that net returns from certified timber production were higher compared to non-certified timber provided the costs of certification were covered by external aid. The authors also found that a forest size of 3000 hectares is the minimum requirement for certification to be cost effective in Vietnam. The study concluded that the cost of certification remains a key discouraging factor for growers to engage in the certification process and suggested that sawmills could offer better prices for growers and that the government should support the creation of smallholders' associations. In Chile, Tricallotis et al. (2018) found that both FSC and PEFC certification schemes have been largely positive and have helped address the deforestation issue, improved the rehabilitation of natural ecosystems, brought benefits to local communities and developed a constructive dialogue between business owners and stakeholders. Nonetheless, the certification impacts were found to be greater for forest plantations and large businesses. A remaining challenge, however, is the ability of the certification standards to tackle disputes related to indigenous peoples' land rights and workers' livelihoods.

In the Russian Federation, several studies have implemented an interview-based approach to determine perceptions towards FC (Matilainen 2013; Ulybina 2013; Ulybina and Fennell 2013; Tysiachniouk and McDermott 2016; Henry and Tysiachniouk 2018; Proskurina et al. 2018). These studies have highlighted the role of NGOs in advocating FC in Russia and that FC has introduced various favorable institutional constitutional changes in Russian forestry. However, the studies have identified key challenges to FC in Russia, such as the top-down state influence, the prioritization of economic benefits over social and environmental sustainability and the welfare of local communities, the favoring of larger companies, weak forest infrastructure and low productivity.

1.4 Forest certification in the Russian Federation: Challenges and developments

The FC process in Russia is shaped by several internal and external factors. As described above, the adoption of international standards, the emergence of social and environmental movements led by NGOs, globalization and subsequent trade agreements are some of the external factors. At the domestic-level, deterioration of forest resources and weak involvement of public institutions to improve forestry practices, the desire of timber companies to maximize profits in short term, and the rise of ethical forest management have been seen as key internal factors promoting forest certification in the Russian Federation (Ulybina and Fennell 2013). However, the process has been deemed slow and prolonged, and has been subject to opposition amid a period of contentious politics (Henry and Tysiachniouk 2018). Russia is second to Canada in terms of FSC certified forest territory. Russia has the fifth largest number of FSC certificates (NC-FM/COC-023735) with approximately 2.5 million hectares covered by a single certificate. As of March 1st 2019, Russia has approximately 43 million hectares of FSC certified forests and the FSC has granted 235 forest management (FM) certificates and 796 COC certificates (FSC Russia 2019). It is believed that demand for FSC certification by European buyers has paved the way for FSC dominance (Tysiachniouk 2013).

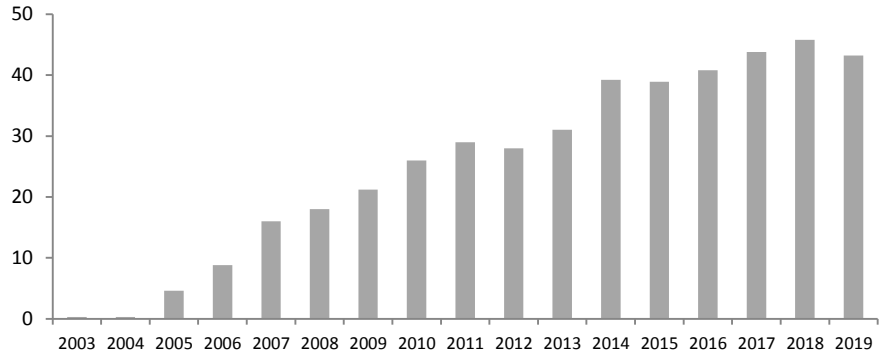

Figure 1. Development of Forest Certification in Russia (in million hectares).

The rapid process of FSC certification since 2000 has affected the quality of the issued certificates (Malets 2014), and has consequently led to the temporary suspension of certificates with a notice to improve forest management practices (Henry and Tysiachniouk 2018). This perplexing situation has promoted the recognition of the Russian National Forest Certification Scheme under PEFC as an alternative certification program at the international and domestic levels. Promoted by timber industry participation, the area of Russian forest certified by PEFC grew to reach 8.2 million hectares by the end of 2016 (PEFC 2017) and has continued to grow rapidly, reaching 20.8 million hectares at the beginning of 2019 (PEFC Russia 2019). Thus, PEFC certified areas have more than doubled in the most recent 3-year period, although the majority of newly certified PEFC certified forests overlap with FSC certified forests. The forest certification process and debate in Russia is highly influenced by a number of key elements including, *inter alia*, the high level of biodiversity in the Far East region, proximity to markets that both value certified wood and markets that do not value certification, knowledge of the FSC process and standards, the degree of stakeholder participation, and conservation targets in HCVF territories (Ulybina and Fennell 2013; Henry and Tysiachniouk, 2018). Since early 2000, FC in Russia has gained momentum, accompanied by changes in the forest policy landscape and by debate. The Forest Code, which was adopted in 2006 and enforced in 2007, was a form of decentralization that transferred the monitoring responsibilities of forest management from the federal level to regional agencies (Lesnoi Kodeks RF 2006). It has also resulted in a shift of tenure rights (e.g. introduction of long-term leasing contracts) from the state forest management units to private forest leaseholders. Leasing rights were extended from 10 to 49 years (Torniainen 2009).

The Forest Code does have some weaknesses, which include the request that forest leaseholders undertake and fulfill new management roles, such as firefighting and the monitoring of endangered species. However, leaseholders do not have sufficient expertise to carry out these new tasks (Hitchcock 2010; Henry and Tysiachniouk 2018). The adoption of FC has also been driven by several NGOs, mainly WWF-Russia and Greenpeace International. The latter was involved in the development of IFL Motion 65, which was adopted by the General Assembly of the FSC in September 2014 (Greenpeace Canada 2015). The motion affirms the existing commitment of the FSC to the protection of IFL as a category of HCVF. The Motion 65 resolution led to a modification of National Standards to ensure that FSC certification safeguards IFLs in areas that are FSC certified. Although the FSC is grounded in ten principles, Motion 65 is directly connected with Principle 9 (Maintenance of High Conservation Value Forests). As per the Motion's requirement, logging should not affect more than 20 % of IFL within the management unit, and logging should not reduce the territory of IFL below a 50,000 hectare threshold in the landscape (FSC Russia 2017). The discussion related to the practical implementation of the Motion 65 resolution has led to a robust debate between FSC certified companies and NGOs, with a common understanding currently absent (Forestforum 2016).

The most recent development on certification policy has been the adoption of the "7th version of Russian's FSC National Standards", approved in October 2012, then revised and again approved in April 2015 (Henry and Tysiachniouk 2018). One of the special features of this policy development is the creation of a Special FC commission based in the Far East region with the aim to create new methodologies for allocating HCVF areas. In 2011 and 2012 and before the adoption of the "7th version of Russian's FSC National Standards" a multi-faceted anti-certification discourse emerged in the Far East region questioning the overall legitimacy of FC. Companies in the Far East perceived FC as a threat to their

existing economic activities by arguing that certification is stricter in Russia and that FC has become an obligation for export rather than a voluntary choice (Henry and Tysiachniouk 2018). In contrast, companies in the Northwestern region have attempted to avoid certain certification indicators rather than collusion with the whole process (Tysiachniouk 2008). Henry and Tysiachniouk (2018) further explain that these regional differences initially resulted in a collective mobilization effort to weaken or undermine the certification standards, yet eventually paved the way toward constructive dialogue between stakeholders in 2013–2017. The authors concluded that new and inclusive channels and forums of negotiations will lead to further growth and expansion of certification as a key element in forest governance in Russia.

Other theories governing/influencing the implementation of FC in Russia allude to "path dependence", which is a social phenomenon characterized by a form of social and economic undesirable 'self-reinforcing processes' that persist in a society with high costs of reversing (Ulybina and Fennell 2013). For instance, communism-era mentality (a strong path-dependence) may still persist in Russia, and has led to a stagnation of reform efforts, particularly in forest management and use (Ulybina 2010; Ulybina and Fennell 2013). Other forms of institutional and political barriers to natural resource governance in Russia are grass-root based. The country still has a dominant state power, and so multi-governance and/or participatory approaches that involve ENGOs, relevant stakeholders and environmental activism, for example, struggle to establish a strong and influential identity (Ulybina 2010; Henry 2010; Ulybina and Fennell 2013). Moreover, FC as such is a form of governance, yet again; it remains a perplexing and contentious process in Russia (Ulybina and Fennell 2013) due to its external nature and the lack of understanding of its basic characteristics and motives. In this sense, study of FC in Russia is essential in order to acquire deeper insights and to explore the attitudes and motives that drive the path-dependent social phenomena.

Attitudes are essentially a construct of social psychology (Milfont and Duckitt 2010) and provide a potential advantage for the understanding and prediction of human behavior, and that attendance to attitude brings changes in behavior (Milfont and Duckitt 2010; Zyadin 2015). This latent construct cannot be measured directly but inferred from overt actions and can have immediate influence on closely related behavior (Zyadin 2015). Attitudes consist of beliefs, feelings, and emotions about the object (FC in this case) and the behavioral elements of attitudes may surface as actions and responses within social and cultural boundaries and in contexts such as path-dependent or state dominant social phenomena (Milfont and Duckitt 2010; Zyadin 2015). An extensive body of scientific literature suggests that attitudes, emotions and beliefs regarding FC should be examined closely rather than simply streaming knowledge to relevant stakeholders. Furthermore, in studying attitudes, "objective" factors such as age, experience, political orientation and business profile (in the case of timber companies) may also steer behaviors and perceptions in a certain direction. There are several ways to measure attitudes. A questionnaire seems the most suitable procedure as it garners a representative sample, although people may seek to edit their answers before they communicate them and that changes in the question format or even question sequence may affect the answers considerably (Schwarz 2012).

1.5 Theoretical background

The East India Company (EIC) (16^{th}–19^{th}-century) is an example of a company with an absolute monopoly, for example, over tea, silk, species, and opium trading from the Orient (India and China). The EIC had an army and was able to introduce laws and regulations in colonized countries. However, the company also provided 10 % of total British income through taxes and made tea an affordable commodity available to the public (Robins 2006). With the evolvement of industries and agricultural expansion, more companies were formed and cross-border resource exploration was needed to maintain production in the homeland. Since then, business principles and operations have evolved and have drastically changed. This has been a major tenet in neoclassical theory that market-based economic growth will result in an increase in gross domestic product, which will result in various benefits for all levels of society (Longo et al. 2016). The rise of capitalism offered opportunities for business expansion and wealth accumulation (for a small number of business leaders). However, in recent times mega-companies- or unicorns- have been under public scrutiny in regard to their social and environmental performance and legitimacy rather than for their economic performance. The economic crisis in 2008–2009 and the subsequent economic recession called for a revision of the capitalist financial model and how companies operate on the global markets.

In the late 20^{th} century, environmental devastation was becoming more fully recognized. In some cases, the public have used "naming-and-shaming" campaigns to bring large corporations to account for spillovers, loss of biodiversity, and deforestation. These norms and social sanctions have played a pivotal role in fostering the adoption of sustainability standards, of which forest certification was a complementary mechanism (Van der Ven and Cashore 2018). Even though sustainability standards were (and still are) inherently voluntary, social and environmental activism, propelled by ENGOs, has transformed the voluntary form of natural resource governance into a semi-obligatory one (Meidinger 2006; Van der Ven and Cashore 2018). Corporate legitimacy and social contracts have continually evolved due to the rise in social democratic systems, business ethics, indigenous group rights, and environmental activism. Therefore, corporate legitimacy has shifted from simply focusing on certain stakeholders (e.g. stakeholder theory) to a wider social base (systems theory), and from single financial performance to broader social and environmental performance (informative theory) (Panwar 2008). Panwar (2008) also argues that NGOs have sought broader social legitimacy by finding and highlighting "problems" that are considered important to society - the greater the legitimacy the more power is gained.

These transitional changes have also led to the emergence of new and contemporary trends in natural resource governance with the introduction, adoption, and implementation of Corporate Social Responsibility (CSR) or similar [social license to operate], and forest certification (FC) schemes in the forest sector. These information-based environmental governance (Van der Ven and Cashore 2018) complementary tools seek to improve the social and environmental status quo of forest industries by providing information to steer consumers' behavior and perceptions, and simultaneously provide the companies with

guidelines and standards on how to manage, for example, the natural resources in an environmentally appropriate, economically viable and socially beneficial manner (FSC 2014; Bullock 2017; Van der Ven and Cashore 2018; Liu et al. 2019). By doing so, corporations have gained more accountability, a better reputation, and visibility in global markets, particularly green-minded and environmentally sensitive markets, such as the European Union (EU).

The transition toward broader social and environmental legitimacy in forest industries was orchestrated by several institutional and societal changes amid public recognition of natural resource devastation, of which, forests were most affected. In a recently published book, Hansen et al. (2014) identified two overarching features of the traditional forest sector: low-cost orientation and industry fragmentation characterized by a low-profit outlook. Focusing on reducing operational and production costs, the existence of numerous small-scale industries increased intra-competition (competition within the same industry), which resulted in relatively poor profitability levels and reduced competitiveness and innovativeness in the industry. The authors further argue that the adoption of highly sophisticated technology for the extraction of raw materials and for the manufacture of products, and the unprecedented global financial crisis (Hansen et al. 2017) have instead created a shift from a raw material-focused business orientation to a market-focused one. Hansen et al. (2017) carried out a study on 89 US-based forest companies to investigate their reaction to the "chaotic business environment" observed during periods of economic downturn. They found that the companies that had focused on finding new foreign markets with a stronger customer business orientation thus gained higher process innovativeness (Hansen et al. 2017). Cashore et al (2005) used survey data from companies in Canada, the United States and Germany to investigate the reasons why a particular company would prefer and/or choose a certification scheme and found that companies choose to certify for economic grounds and to gain access to markets.

Re-orienting sales toward foreign markets has also been propelled by globalization, WTO international trade agreements, and low production costs overseas, especially in countries with minimal environmental regulations (Hansen et al. 2014). To avert the consequences of low profitability, consolidation and/or vertical acquisition has also occurred within the forest industrial sector, which has shortened the value chain, improved product distribution, and created a platform for knowledge exchange and innovations that have sparked the production of new wood-based products, such as the use of wood-based fiber in textile and bioplastic packaging, and notably in (bio)energy and the generation of liquid transportation biofuels (bioethanol, biomethanol). These transformational and multidimensional changes have also been orchestrated by stringent environmental and sustainability policies and regulations (mainly in the EU), and the introduction of renewable and bioenergy targets (Hansen et al. 2014).

Cooperative organizations/associations (Heras-Saizarbitoria et al 2018) have also witnessed resurgence in recent years, as these decentralized entities are viewed as effective tools to bridge the legitimacy gap (Panwar 2008) between society and corporations. They were regarded as effective in "addressing environmental and social issues while also generating economic benefits for members and for communities" (Heras-Saizarbitoria et al 2018). This emerging business concept in the EU (German, Spain, UK and Denmark),

Canada and the United States has been deemed risk resilient, sustainable, with least public opposition (Heras-Saizarbitoria et al 2018). In Finland, for instance, farm cooperatives (milk, meat producers) and family-owned forest companies have product standards that are higher than the targets set by the EU laws (pers. comm). As such, they have gained explicit social legitimacy, long-term support and acceptance by the general public, even at product prices that are slightly higher compared to imported (cheaper) products. Therefore, it is compelling to argue that societal acceptance and support provides a reputational premium to companies operating in global markets and may signal better economic performance for the company in the future, reduce risk exposure (Lys et al. 2015), and allow informed investment decisions (Cohen et al. 2011). Matilainen (2013) argues that FC can be regarded as an CSR initiative in the Russian forest sector and mainly involves the company, its employees, and local communities. Matilainen also argues that the openness to EU markets and their elevated consumer awareness has propelled the adoption of CSR in Russian forest companies. In Russia, CSR has been a consideration for a long time; in the Soviet era, companies in remote areas were called "town constituting enterprises" (gradoobrazuiushchee predpriiatie) (Matilainen 2013). These companies regarded the residents as primary stakeholders (or vested stakeholders) and provided considerable social services and infrastructure to local towns (Yudakhin et al. 2002; Kortelainen and Nystén-Haarala 2009; Kuliasova 2010). This was a form of explicit CSR as the state also provided resources to companies to carry out these social services. In the aftermath of the collapse of the Soviet Union, the shift to market economy stakeholders became secondary (non-vested), as the social services became a fiscal burden. It was argued that the provision of social services was a key reason for the bankruptcy of many forest companies (Kuliasova 2010; Matilainen 2013). However, many FC studies in Russia have referred to the entrance of large foreign companies into the Russian forest sector as reshaping the concept of CSR in the whole sector. With the rise of modern telecommunication systems and social media, NGOs in Russia have shifted slightly from being secondary to primary stakeholders, thereby affecting the decision making processes and orchestrating the adoption of forest certification and the key principles of CSR.

1.6 Research objectives

Given the importance of Russian forests for the global environment and timber trade, it is critical to analyze the FC process and the perceived impacts and benefits of FC as viewed by timber companies - a key and influential actor in the development of sustainable forest management in the Russian Federation. Since EU timber companies are urged to exercise a DDS and maintain an up-to-date record system for suppliers and customers, an analysis of the selected DDS system might bring insights on how illegal timber is currently tracked down and excluded from the markets. Moreover, the frequency and intensity of NCs may provide an indication of the extent that forest companies currently implement the FSC standards and the Russian National Forest Management Standard. Therefore, the main objectives of this thesis are to:

I. Examine the attitudes and motivation of representatives from forest industry companies currently operating in the northwestern Russia towards forest certification. Specifically, (1) analysis of the forces that drive the development of forest certification; (2) identification of the benefits and primary barriers of forest certification among certified and non-certified forestry companies; and (3) identify variations in perceptions and motivation to forest certification among certified and non-certified companies (**Article I**).

II. Analyze the existing information held by suppliers, risk assessment and risk mitigation measures as parts of an operating company's DDS based on data obtained from 2007 to 2011 and possible suggestions for improvements (**Article II**).

III. Examine the NCs of certified companies as per FSC principles, and geographical location. The northwestern FD will be investigated initially, followed by a study examining the Russian Federation during the period 2011–2015 (**Article III** and **Article IV**).

This thesis also aims to contribute to the existing national and international discourse regarding the impacts of FC schemes on forest ecosystems and on the livelihood of local communities, and will contribute to ongoing research efforts in a Russian forest context. The thesis also seeks to provide policy insights for the promotion of FC in Russia as a tool for sustainable forest management, a platform for negotiations, and ultimately an instrument to effectively tackle the problem of illegal logging.

Based on the previous analysis of the FC process in Russia (see section 1.2 and section 1.3 above), including the legislative reforms and the debate surrounding FC, this thesis aims to test a number of null hypothesizes:

(a) The size, location, and market orientation of a forest company in Russia plays a significant role in the willingness of a company to adopt FC schemes (null hypothesis 1)
(b) FC may help address the problem of illegal logging by reducing the frequency and intensity of non-conformities to FC standards (null hypothesis 2)

By market orientation, I refer to whether timber companies export their timber products to local markets, Chinese and/or Asian markets, or EU markets. It is my contention that market orientation has an effect on a company's propensity to engage in forest management or in the COC certification process.

2 MATERIALS AND METHODS

2.1 Study area: Northwestern Federal District

The Northwestern Federal District (FD) was selected for this study as it is a major supplier of industrial roundwood to Europe. Its juxtaposition to Europe and the export-orientation of the operating companies is another reason to investigate FC development and

implementation in this region. This region includes Arkhangelsk, Vologda, Karelia, Komi, Leningrad, Novgorod, Murmansk, Pskov and Kaliningrad. Some of these regions (e.g. Karelia) are believed to have been logged heavily during the Soviet era (Esipova et al., 2004, (Henry and Tysiachniouk, 2018). The region has also engaged in a series of training workshops related to FSC and, thus, has developed a community of FSC experts. Moreover, large and transitional timber companies operating in the region, such as Mondi, UPM-Kymmene, and Stora Enso, are well accustomed to FSC standards as they acquired global certificates before entering the Russian market (Henry and Tysiachniouk, 2018).

Figure 2. Map of Russia with division into Federal Districts (RusBiz Team 2016).

2.2 Research methods and data collection

In general, there is a shortage of research related to application of quantitative methods and data for determination of the cause-and-effect relationship between FC and the overall performance of forest growth and its biological components (Johansson and Lidestav 2011). Therefore, studies remain country-specific and focus mainly on long-term objectives of a country, and on forest utilization and management policies in that country. Surveys and interviews have been commonly used to investigate forest certification in Russian studies (see e.g. Ulybina and Fennell 2013; Henry and Tysiachniouk 2018). Moreover, the issue of illegal logging and implicit wood trading, particularly in Russia, means that approaching timber companies is a rather difficult task as companies seek confidentiality, and may consider such studies a threat to their operations. In this thesis, primary and secondary data were collected and used for the analysis. Both quantitative and qualitative data were collected, processed, and analyzed using multiple methods, such as survey methods (questionnaire, emails and interviews through phone calls and personal visits), field excursions, and review of the DDS portfolios of the companies.

To assess the motivation and attitudes of Russian forestry companies toward FC (**Article I**), a survey-based study was conducted with special focus on the Northwestern FD. The targeted companies were categorized as certified and non-certified at different operational scales, those with several wood sourcing regions, and companies with restricted domestic and multiple export markets (market orientation). The profiles and contact details of these companies were retrieved from the Industrial Business Handbook of Russia (2012). Companies with clear contact information and visibility in the timber markets were selected. A notification regarding a willingness to participate in the survey study was sent to 100 companies with appropriate and clear contact details. A total of 35 companies (35 % response rate) replied and participated. A company representative was identified to participate in the interview. A snowball process was also used to find and interview representatives of the companies. In this process, the interviewee may recommend another acquaintance in his/her circle join the interview. While the process is subject to a certain level of bias, difficulties in finding and interviewing company personnel is always a challenge in scientific studies. It is preferable that the interviewee is the Managing Director in small companies and/or the person responsible for wood sourcing and certification in the larger companies. A total of 43 questions were tailored for the certified companies and 32 for the non-certified ones. The data collection was conducted through phone calls, emails, and on-site interviews with the company's representatives. To assess the degree of agreement to the perceived benefits of certification and the barriers to its implementation, a 5-point Likert-like scale was developed where 1 corresponds to *very low* and 5 corresponds to *very high* benefits. The benefits were tested through 15 items and 8 items related to barriers. The statistical package IBM SPSS was used and the non-parametric test Mann-Whitney U-test was used to reveal any statistical differences between the certified and non-certified companies. Non-parametric tests are normally used for non-normally distributed datasets as is the case for survey-based studies.

For the second part of this thesis (**Article II**), an explanatory and qualitative assessment was conducted for an anonymously selected forest company in Northwestern Russia. The

company was chosen as the case study due to its 20-year long operational history in Russia, and for its export-to-EU market and business orientation. The company has exported several million cubic meters of roundwood to EU countries. Moreover, the selected company has an efficiently-functioning DDS, and employs its own wood tracking system, which consists of statement of origin, geographic information system (GIS) mapping, and suppliers' databases, which covers suppliers' audits and logging site checks. The company holds an FSC COC/CW certificate (valid from 2007) to fulfill the requirements of the FSC COC/CW standards.

In the second part of this thesis (**Article II**), the aim was to perform an independent analysis of existing information in relation to the case study company's supply chain information, risk assessment, and risk mitigation as part of its DDS regulations and standards. A revision of the following documents was performed for this part of the thesis: (1) DDS documents related to its three main elements, (2) the existing publicly available standard by the monitoring organization NEPCon, (3) the standard FSC COC/CW report retrieved from the certification body's checklist. In addition, Annexes 1–3 of the LegalSource standard, which was developed by NEPCon (and designed to implement DDS so that risk evaluation of wood or wood products could be carried out and appropriate mitigation measures taken if necessary) were also reviewed (LegalSource, 2013). For risk assessment and risk mitigation, the information was collected based on verification of legal documents and results of field verifications from 2007 to 2011.

The third objective of this thesis was dedicated to analyzing the minor and major non-conformities (NCs) of the FSC certified companies in Northwestern Russia during the period 2011–2015 (**Article III**). The main purpose was to identify, in principle, the minor and major NCs, and to identify the regions with the most failures. The study area included the following regions in the Northwestern FD: Karelia, Komi, Arkhangelsk, Vologda, Leningrad, Novgorod, Murmansk, Pskov and Kaliningrad. All active certificates (as of 18th July 2016) from the Northwestern part of Russia were used in this study (Table 3, **Article III**). A total of 69 certificates were identified and used for this study. These certificates refer to either an individual certificate (one company) or a group certificate. The data was coded, based on the size of the leased forest area where 1 = 0–100 000 hectares (small size), 2 = 100 001–300 000 hectares (medium size), 3 = over 300 001 hectares (large size). The number of NCs were also re-coded for statistical analysis. Thus, for minor NCs; 1 = 1–5 NCs, 2 = 6–10 NCs, 3 = over 10 NCs; whereas for major NCs; 1 = 1–3 NCs, 2 = 4–6 NCs, 3 = over 6 NCs. Information regarding NCs was garnered from public reports available in Russian and English on the FSC web-site (www.info.fsc.org). Identified NCs were recorded in a Microsoft Excel database and were allocated to the ten FSC Principles according to severity (minor or major) (Table 2). In addition, the database included information on certified area and type of certificate. The collected and coded data were analyzed using IBM SPSS Statistics. The non-parametric Kruskal-Wallis test was used to reveal significant differences among FSC-certificates within different sized leased forest areas and was done separately for the major and minor NCs. The Kruskal Wallis test enables the identification of statistical differences among three or more independent variables and can be used for non-normally distributed data. It should be noted that during the period of assessment (2011–2015), the Russian National Standards were upgraded from 6.0 to 6.1. Therefore, companies with certification before 2013 were analyzed using version 6.0 and those certified after 2013 were analyzed using version 6.1. To further expand the scope of this thesis, the minor and major NCs of the FSC certified companies were expanded to include the whole Russian Federation (**Article IV**). In doing so, all valid certificates registered in

Russia (as of 30th November 2016) were used in the analysis. The ten FSC Principles were used to measure the frequencies of NCs in both the Northwestern region and in the Russian Federation as a whole (Table 2). These NCs were categorized according to their severity (i.e. minor or major).

Analysis of NCs was carried out using FSC public annual reports (FSC 2017). When analyzing the reports, a database in an excel sheet was created to identify the names of the companies, their locations, and the size of the certified forest areas of each company. The NCs were identified according to Principles 1 to 10 and according to their severity (i.e. minor or major) for the period 2011–2015. The data was coded separately for major and minor NCs and according to the size of leased forests and the number of NCs.

Table 2. Forest Stewardship Council (FSC) principles (FSC 2012) and structure of Russian National Forest Management Standard on criteria and indicator level.

Principles	Criteria		Indicators	
	N	%	N	%
P1: Compliance with the laws and FSC principles – to define, document and legally establish long-term tenure and use rights.	6	11	20	7
P2: Tenure and use rights and responsibilities – to define, document and legally establish long-term tenure and use rights.	3	5	9	3
P3: Indigenous people's rights - to identify and uphold indigenous peoples' rights of ownership and use of land and resources.	4	7	22	7
P4: Community relations and worker's rights - to maintain or enhance forest workers' and local communities' social and economic well-being.	5	9	32	11
P5: Benefits from the forest – to maintain or enhance long-term economic, social and environmental benefits from the forest.	6	11	27	9
P6: Environmental impact – to maintain or restore the ecosystem, its biodiversity, resources and landscapes.	10	18	81	27
P7: Management plan – to have a management plan, implemented, monitored and documented.	4	7	28	9
P8: Monitoring and assessment – to demonstrate progress towards management objectives.	5	9	28	9
P9: Maintenance of high conservation value forests – to maintain or enhance the attributes that define such forests.	4	7	25	8
P10: Plantations – to plan and manage plantations in accordance with FSC Principles and Criteria.	9	16	27	9
SUM	56	100	299	100

2.3 Data limitations

The number of companies listed in the Industrial Business Handbook of Russia (2012) with approachable contact information was limited, thus making it a challenge to generate a representative sample Thus, I was constrained from conducting a stratified random

sampling strategy. Instead, companies were shortlisted and contacted directly to establish research cooperation, and their acquaintances in the field were also considered through the snowball method.

It was assumed that interviewing one expert from a company would provide objective perceptions in regard to the company's operations. However, this assumption is associated with uncertainties and I was fully aware of these constraints. Nonetheless, the participant companies in this study represented approximately 70 % of the market share of wood consumption in the Northwestern region of Russia. The focus of this study was not to quantify the on-site impacts of FC in Russia but rather to provide an overview of perceptions toward FC, and to examine the nature of non-compliances made by various types of timber companies (e.g. large vs. small), location (northwestern vs. whole Russia), and export markets (China vs. EU). The conclusions drawn from this thesis do not attempt to assess the impacts of FC on forest growth and on their biophysical conditions in Northwestern Russia since such an assessment would require field observations in previously certified forests, as well as practical expertise and competence.

3 SYNTHESIS OF RESULTS

The business portfolio of the interviewed companies revealed several distinctions between the certified and non-certified companies (**Article I**). As mentioned in the introduction, reasons for non-certification may arise from the unfamiliarity of the industrial forest companies with the certification process, principles and standards, an inability to pay the certification fees, political and institutional reasons (e.g. FC is viewed or perceived as an external influence), and/or uncertainties about the outcomes of the FC process. For instance, it was found that certified companies are usually medium or large (up to 1000 employees) in size, whilst most of the non-certified companies are very small in size (less than one hundred employees). Non-certified companies were also found to have primary products (roundwood, and partly sawnwood) with an intermediate customer, compared to certified companies that had a more value-added product supply chain (e.g. veneer, furniture components, panels, paper and packaging) and industries as their main customers. It was also found that non-certified companies have slightly more forest leasing contracts (58 %) compared to certified companies. In regard to the certification process, it was found that the majority of certified companies (21 out of 35) have had a combined certificate (forest management/COC and/or COC/controlled wood) mainly from FSC. This was not a surprise as the data from FSC 2014 and PEFC 2014 shows that Russia has close to 38 million hectares certified by FSC compared to about 3 million hectares certified by PEFC (FSC, 2014; PEFC, 2014). This study has also found that the combined certificates were granted by FSC only.

The general attitude toward FC revealed some difference between the certified and non-certified companies. For instance, non-certified companies considered market demand and the interest of stakeholders as key drivers of FC participation. These companies also perceived FC as generating a positive economic impact on their operations and highlighted the importance of FC in tackling illegal logging. The certified companies, on other hand, indicated the importance of the corporate "internal policy" as a driving force toward FC and also highlighted the importance of market demand, stakeholder interest, and the demands of

foreign customers (e.g. EU importers) for certified wood as key factors in the FC process. The perceived benefits from certification were tested through 15 items (Table 2, **Article I**). For the certified companies, "ensuring the legality of the wood materials" had the highest importance (90 %), followed by "improved image of the enterprise for the stakeholders" (67 %), "higher interest to certified products from the customers" (62 %), and "better access to demanding markets" (57 %). The certified companies ranked "advantages in bank loans" and "easier functioning with authorities" as providing the least benefits from FC. For the non-certified companies, the perceived benefits of FC had a higher rating compared to certified companies, with the exception of "ensuring the legality of the wood materials" (86 %). Other issues perceived to be of considerable importance for the non-certified companies included "additional sales of wood products" (86 %), "improving the image of the enterprise" (79 %) and "improved occupation health and safety issues" (71 %).

A key element in this study was an investigation of the barriers to FC as perceived by the participant companies (Table 3, **Article I**). Certified companies indicated that "voluntariness of certification" appeared to be a barrier with high importance (57 %). For the non-certified companies, however, "economic inaccessibility" had the highest importance (79 %) followed by "voluntariness of certification" (64 %), "absence of legal requirements from customers" (50 %) and "low level of preparedness of management system" (43 %). Surprisingly, issues related to accountability and transparency was not perceived as important barriers to FC. For instance, the statement "subjectivity of assessment by auditing companies" and "unawareness of top management" were ranked lowest in terms of importance as barriers. Overall, this study revealed that the level of awareness and acceptance of FC is relatively high among certified companies compared to non-certified ones. However, both groups of participants showed positive attitudes towards FC. Moreover, the study showed that FC is seen as a tool for economic growth for small non-certified companies but for large companies it is viewed as a tool to maintain their reputation.

Large timber companies have considerable influence on wood procurement from legal sources. In this study (**Article II**), I selected a large timber company as a cases study to investigate its operational framework by analyzing its DDS against the EUTR. The company outsourced wood materials through signed agreements with its suppliers to conform to national and international principles and regulations, in a manner similar to FSC CW risk assessment. If there is non-compliance with the bilateral agreement, the company may eventually reject the load or terminate the contract. The company prioritizes new suppliers and larger-than-normal loads, although it places extra emphasis on suppliers with delayed legal documentation, multiple-actor suppliers, and additional attention is paid to suppliers that operate near highly-valued conservation forest areas, as per FSC standards. To do so, the company has an Information Tracking System that consists of three elements: statement of origin, a database and GIS mapping, and field verifications. The supplier's information reflects the number of the actors involved into supply chain for further risk assessment and mitigation measures (Table 4, **Article II**). The results indicated that the majority of supply chains involve at least two actors, and the proportion of a 3-actor supply chain system has increased from 21 % to 28 % between 2007 and 2011. The number of supply chains has also decreased during the same period. Information available from the case study company suggests that the company prefers larger loads at a time, instead of multiple smaller ones. With an updated GIS database in regard to strictly protected forest areas (registered, moratorium), the company is able to decline loads from these protected areas, as per the National CW FSC risk assessment (FSC CW Risk Assessment 2013).

The second part of this study involved sample-based field auditing of fifteen forest sites in the Leningrad region and in five districts (Table 5, **Article II**). The Leningrad region was chosen, as the majority of suppliers are based here. The routinely performed auditing process is carried out by two persons and is based on Annex 3 of the FSC CW standard (FSC Company Evaluation/CW, 2014). Auditing is carried out once every five years for regular suppliers, new suppliers, and suppliers with a history of NCs or non-compliance. Table 6 (**Article II**) provides an overview of the frequency and timing of the field audits between 2007 and 2011. Data shows that the number of audits has declined from 229 in 2007 to 170 in 2011, probably due to the shift toward larger loads and, thus, fewer audits were required. Between 2007 and 2008, the majority of audits were carried out during and after logging but before transportation. From 2009, the audits were carried out after logging and transportation. It is believed that poor communications between the auditing committee and the suppliers may affect the timing of the auditing process. This can be regarded as a process weakness as it is advisable to carry out the field checks during the logging operation, especially for multi-actor suppliers.

Several types of major NCs were identified based on the experience of the company, FSC CW requirements and field verifications: legal documentation, quality of preparation before logging, quality of logging operations, fire safety and waste handling, and work safety (Table 7, **Article II**). NCs in work safety were high in 2007, although by 2011 the number had decreased by 30 %. Over the same time period, poor quality preparation work increased from 9 % to 18 % but the quality of logging operations increased (i.e. the number of NCs decreased from 18 % to 7 %). For major NCs, 23 sub-categories of violations were identified (Table 8, **Article II**). Issues (violations) such as lack of site information and maps, absence of data on logging pole, soil damage, littering, and the absence of warning signs were some of the most frequently NCs/violations recorded during and after logging operations. Risk assessment showed that the company had adopted and implemented appropriate and stringent measures to explicitly show its compliance with national and international legislations, specifically related to illegal harvesting avoidance or any potential political conflicts that may result from sanctions imposed by UN Security Council in accordance with Article 6, 1b of Regulation (EU) 995/2010. For the Risk mitigation assessment, the company provided written feedback to the suppliers regarding detected NCs in the supply chain. Extra verification efforts were deployed to avoid over-logging, logging at unknown locations, use of forbidden tree species and/or forbidden cutting machinery. The company requested initial information from the supplier to verify the load or to decide whether further verification was needed. The supplier was asked to sign a declaration that FSC requirements were followed, which improves the process of verification. In addition, stringent measures, such as contract termination, were performed if the statement of origin was not delivered one month prior to load delivery. These measures implemented by the company highlight the role of the companies to ensure that only appropriately logged wood is delivered to foreign customers. The case study company appeared to have invested significant effort into developing its DDS, which is in harmony with the requirements of FSC COC/CW standards and appeared in line with the EUTR requirements.

The third part of this study investigated the NCs (major and minor) in the Northwestern part of Russia (**Article III**). The total area of certified forests in the six districts of the Northwestern region is presented in Table 3 (**Article III**). As noted, the number of FSC certificates has steadily increased since 2011, and by 2015 slightly over 20 million hectares of forest areas have been certified by FSC, which represents 16 % of the total forest area in

this region (Karjalainen et al. 2009). As per the ten Principles, the number and frequency of minor NCs have been recorded (Table 4, **Article III**). The analysis showed that the number of minor NCs has increased since 2011, from 221 up to 363 incidents by 2015, which also coincides with the increase in the number of issued FSC certificates. Moreover, the majority of minor NCs that occurred in the Republic of Karelia violated Principle 6 "Environmental impact – to maintain or restore the ecosystem, its biodiversity, resources and landscapes" in accordance with FSC Principles and Criteria". In 2013–2015, the majority of NCs occurred in the Arkhangelsk region, again with Principle 6. The results also showed that the total number of identified NCs was highest for large-sized leaseholders. For the major NCs, the majority of incidents occurred under Principle 6 (Table 6, **Article III**). It was also noted that while the number of issued FSC certificates increased, the number of major NCs also increased. As per the size of leased forest area, the number of major NCs was highest (49) in the large-sized leaseholders' group (Table 7, **Article III**).

Using a similar approach, an overview of FC and the number and frequencies of minor and major NCs were recorded and analyzed for the whole Russian Federation (**Article IV**). The total number of FSC certificates during the 5-year period increased by more than 2-fold from 47 to 129 certificates, with over 50 % of the certifications issued for the Northwestern FD.

By 2017, over 42 million hectares of forests have been certified (Table 3, **Article IV**). About half of all certified forests are in the Northwestern FD, followed by the Siberian and Far Eastern federal districts and represent 40 % of all certified forests in the Russian Federation. The analysis shows that the highest number of minor and major NCs occurred under FSC Principle 6. In the period 2011–2015, the number of minor NCs increased 2.2-fold, while the number of certificates in the same period grew 2.7-fold (Table 4, **Article IV**). For the same period, the number of major NCs increased 4.6-fold, although the number of certificates increased 2.7-fold. (Table 5, **Article IV**). The Northwestern FD had the highest number of recorded minor NCs, although a significant increase in minor NCs occurred under Principle 6 in 2015, with 97 NCs recorded in the Siberian FD. The Siberian (15) and Northwestern (11) FDs had the highest number of major NCs during the study period. In 2013, a large number of NCs was issued in the Volga FD under Principle 4 (27) and Principle 6 (23). In 2015, a significant increase in NCs also occurred under Principle 6 (34) in the Siberian FD. The frequency and distribution of both minor and major NCs were examined against the size of leased forest area. In contrast to the results from the Northwestern region (**Article III**), the majority of minor and major NCs in the Russian Federation occurred within the small-sized leaseholder group. Moreover, a substantial proportion of minor NCs (94) and major NCs (30) were identified under the large-sized leaseholder group, and under FSC Principle 6 (Table 6 and Table 7, **Article IV**).

4 DISCUSSION

The level of awareness and acceptance of FC in the Northwestern region of Russia was found to be higher in certified companies compared to non-certified companies. This finding is in line with previous studies that investigated the entrance of large foreign companies into the Russian market with new standards and principles of CSR and visions

for the stakeholders' power and legitimacy (Matilainen 2013; Ulybina 2014; Tysiachniouk and McDermott 2016; Proskurina et al. 2018). The shift towards a market economy and non-state governance (propelled by NGOs) is considered to have been the impetus for certification.

In general, both certified and non-certified companies exhibit positive attitudes toward FC. This could be explained by the link between certification and the anticipated economic benefits from certification, such as access to EU markets, price premiums, but also non-economic benefits, such as an exclusive CSR and social license to operate (Jenkins and Smith 1999; Van der Ven and Cashore 2018). Furthermore, the respondents in this study appeared optimistic about the certified wood markets and believed they have the potential to grow for export-oriented companies. The demand for roundwood is expected to grow by 2 % annually with 3500 Mm^3 extracted and traded annually (Ramage et al 2017). However, the respondents were skeptical in regard to potential growth in the domestic markets. According to a recent study by Henry and Tysiachniouk (2018), FSC certification in the Northwestern region is an arduous process that requires institutional transformation and maturation. However, companies in this region have engaged in the certification process critically but have not directly opposed its introduction. The region has benefited from FSC-related training sessions (with the assistance of WWF-Russia), which has contributed to positive local experiences and to the development of a community of experts (Henry and Tysiachniouk (2018). Due to transnational corporate policies supporting certification (Pappila 2009), timber companies in the Northwestern region choose to avoid specific certification indicators rather than taking an explicitly opposing stance to the whole certification process (Tysiachniouk 2008; Henry and Tysiachniouk 2018). These factors seem to have paved the way toward rapid adoption of FC in the Northwestern region compared to the Far East region, for example. The respondents in this study considered the "legality of wood origin" to be of high importance, which guarantees access to European markets that demand legally felled timber from sustainably managed forests (Ptichnikov and Park 2005). According to Ulybina and Fennell (2013), the main driver for FC is not related to awareness of ecological problems or environmental values but is, instead, a market incentive and profit maximization target, e.g. through the reduction of expenses associated with forestry works. Other benefits associated with certification (as indicated by the respondents) were the company's image and the competitiveness of its wood products, which are directly connected to access to European markets.

The respondents indicated that the largest barrier hindering the potential development of FC in Russia is the voluntary concept of the certification process. Companies may view the process as non-mandatory, especially small-scale companies or companies with a history of illegal harvesting activities, or companies with access to markets that are least demanding for certified wood (Henry and Tysiachniouk 2018). In addition, the non-certified companies referred to "economic inaccessibility" and "low level of preparedness of the company's management system" to be highly important, whilst certified companies considered these factors to be of low importance. Non-certified companies in this study represented small-scale companies, whilst respondents from certified companies represented medium- to large-scale companies. Therefore, it is rather compelling to argue that the certification process has not been successful in engaging small-scale forestry companies. The cost of certification remains a crucial aspect in the way that FC is accepted and promoted, not only in Russia but also in the United States and China (Jaung et al. 2016; Tian et al. 2018). Small-scale non-certifying companies are, in general, unaware that the participatory fees for certification can be outsourced in some countries (Tian et al. 2018) or charged against the

company's annual turnover (FSC AAF Policy 2011). In contrast, larger companies tend to have quality management systems and resources in place and are likely to pay lower costs than smaller companies when implementing certification (Vidal et al. 2005). For large companies, certification itself reduces costs as forestry work is reduced in cases where partial felling and natural regeneration is implemented (Henry and Tysiachniouk 2018). Similar concerns in regard to certification costs have been voiced in Russia (Ulybina and Fennell 2013) as the certification process requires a substantial amount of changes to be introduced to existing financial and administrative systems of non-certifying companies.

Other barriers to certification in Russia include a lack of experts (Ulybina 2013), ineffective management, illegal migrant workers, timber procurement from dubious sources, and a lack of wood processing facilities in some regions (Ulybina and Fennell 2013). Overall, there is a need to introduce changes in people's attitudes, especially for those working in the forestry sectors with regard to how forest as an ecosystem is valued for purposes other than timber harvesting. There are other socio-economic, demographic, and political factors that may result in support or rejection for certain ideas. For example, education level, age, political ideology, professional experience and openness are some factors that may shape the perceptions and attitudes towards FC in Russia (Ulybina and Fennell 2013). In the Russian Federation, a number of mechanisms already exist to ensure the legality of timber products. These include compulsory state-based reporting mechanisms at federal and regional levels, as well as voluntary FC mechanisms (FAO 2012, Russia and EUTR 2018). Many private timber companies have developed their own tracking systems to identify the origins of the purchased wood. Large corporations emphasize the so-called "wood-flow control" in their management system, which makes their operations more efficient in finding the optimum balance between guaranteeing a steady supply of raw materials and maintaining storage capacity at economically feasible levels (EFI 2005).

Less than 30 % of supply chains to a company involve only one actor, or direct supply without the involvement of an intermediate party. About 50 % of supply chains in the 2007–2011 period involved two actors, and 20 % involved more than two. This increases the risk of substitution of raw materials when changing the ownership of the material from one supplier to another, even though the declared volumes might be correct. This is a threat for both the DDS system and FSC certification alike. The proportion of FSC certified input materials are relatively low compared to the total volume of procured materials. In Russian national wood risk assessment, three out of five FSC controlled wood (CW) categories are considered as unspecified risks (FSC CW Risk Assessment, 2013). Two of these three categories of CW, graded with unspecified risk, mainly deal with assessment on a national scale, whereas the CW HCVF category mainly deals with regional risk assessment and could be assessed more locally. This creates inconsistencies in the measures related to verification of illegally logged wood. In order to address this obstacle in the verification process, the company constantly updates its list of SPFAs (Strictly Protected Forest Areas) and their boundaries, re-categorizing either with official status and/or moratorium territories. Moreover, all the logging sites of the supplier are verified using a GIS map, and land and civil rights are guaranteed through communications channels with stakeholders, such as NGOs, labor unions and the Union of indigenous people, in a constant and transparent manner. Indeed, the companies that follow such a socio-political systems of openness and communication with NGOs and regional authorities tend to avoid the issuing of low quality FSC certificates, seek new knowledge and experiences of the certification process, and comply to a large degree with auditing Corrective Action Requests (CARs).

Field audits by the company focus on five main categories that are part of a DDS: legal documentation, preparation work before logging, logging operations, fire safety and waste handling, and work safety. In order to meet the EUTR requirements as reflected in the LegalSource standard, the following categories could be added and implemented under the timber harvesting section: timber harvesting regulations, protected sites and species, environmental requirements, health and safety, and legal employment (LegalSource 2013). The timing of a field audit is a quintessential element in a company's DDS. A field audit during the logging operation is considered to be the most suitable time as it offers the ability to verify the five categories in Annex 1 (LegalSource 2013). During the time frame of this study, the case study company was able to verify 25–50 % of suppliers' audits during its logging operations. However post-harvesting audits showed that 50 % of NCs were related to fire and work safety. Non-compliance with these categories might not be fully assessed if the audits are carried out after the logging operation.

One strident criticism of auditing companies, referred to as "dumping of certification", has resulted in a deterioration in auditing quality (Ulybina and Fennell 2013). Seeking to rapidly expand, increase their market share and profits, certification-issuing organizations and competing auditing companies have jeopardized the core value of certification by (a) making it easier for clients to be certified, (b) allocating less time for audits, and (c) using less experts in the field checks. It is argued that the quality of certification has been compromised by the commercial motives of key stakeholders (Ulybina and Fennell 2013).

Recently, two new tools have been initiated to enhance state control over the wood trade and harmonize different legislations. In the first, the FSC standards are tightened so that they are closer to the EUTR requirements. The "Joint State-Automated Information System of Wood Flow Accounting and Its Trading" (the Russian abbreviation is EGAIS) was developed in line with Regulation (EU) 995/2010 as one of the outcomes of Russian Federal Law 415. It was adopted in December 2013, and has already been partly enforced since July 2014 (Gosbook 2014). The second tool is the FSC's online claim platform (OCP), which helps streamline the validation of FSC claims and make the system more able to scale and adapt (FSC Online Claim Platform 2014). These two tools are relatively young and assessing their applicability and success will require some time. However, tentative assessments have shown that these tools are tailored for one type of wood product, thus limiting their applicability to other timber materials.

The analysis of the company's DDS system revealed a discrepancy in the structure of the functional components, compared to those developed by NEPCon in the Standard. This case study highlighted the key drawback of the system and suggested how the system could be improved. Thus, appropriate timing of field verifications of suppliers is essential in order to cover the whole set of requirements. Greater emphasis should be put on communication with the suppliers in order to avoid confusion in regard to corrective measures and their control from the operator's side. New technologies (e.g. forensic methods, remote sensing, and isotope and DNA analysis) are emerging that independently verify the origin of timber products (WWF 2014). For example, satellite imaging and monitoring has proved efficient in the control of illegal deforestation in Brazil (McDermott et al. 2015). A blend of such technologies with the existing methods would substantially improve the overall certification process.

The study found that in the Northwestern region, the majority of minor and major NCs fall under Principle 6 (Environmental Impact) followed by Principle 4 (Community relations and workers' rights), Principle 8 (Monitoring Assessment) and Principle 9 (Maintenance of High Conservation Value Forests). Our findings are in line with earlier

work by Hain (2012) in Estonia, and Halalisan et al. (2016) in five countries (Bosnia and Herzegovina, Estonia, Romania, Slovenia and United Kingdom), who also reported that most NCs occurred in Principle 6. Similar findings were reported by Buliga and Nichiforel (2019), who analyzed the non-conformities identified between 2008 and 2017 in the 108 FSC audit reports in Romania. Out of 468 CARS analyzed, three main categories of non-compliance were identified; social issues (health and safety) were top of the list followed by environmental issues (Environmental impact of harvesting operations), and forest management issues (Management of harvesting activities). In Brazil, Rafael et al. (2018) analyzed 1086 NCs to FSC standards (disclosed in 110 Public Summary Reports) and found that the occurrence of NCs was most frequently associated with FSC Principles 4 (26.07 %), 6 (21.82 %) and 8 (13.72 %), which are related to the themes "Community Relations and Worker's rights", "Environmental Impact", and "Monitoring and Assessment", respectively. Moreover, other NCs were identified in aspects related to forest planning, operation and monitoring, and occupational health and safety. Overall, our findings correspond to previous studies that found FSC Principles 4 and 6 are common non-conformities in the global FSC certification system (Rafael et al. 2018).

In recent years, the Motion 65 resolution debate revolved around Principle 9. However, our findings show that the number of NCs associated with Principle 6 is much higher than those associated with Principle 9. A key explanation of these findings lies in regional variations, the number of issued certificates, the size of the company, and the nature of the certification bodies. Regions in the Northwestern FD (e.g. Arkhangelsk, Karelia and Vologda) are heavily logged compared to regions in the Far East. Therefore, the higher the number of issued certificates, the higher the frequency of recorded NCs. For instance, during the study period 2011–2015, the number of certificates increased 2.4-fold (from 29 to 69) and the number of minor NCs increased only 1.6-fold (from 221 in 2011 to 363 in 2015), while the number of major NCs increased 3.4-fold (from 25 in 2011 to 84 in 2015). Secondly, whether a certifying body is profit-oriented or not may also affect the quality of certificate and their number. For example, NEPCon is a non-profit organization (NEPCon 2005), and may demand more from leaseholders to meet the ecological standards than other certification bodies in Russia that represent consulting companies and/or other types of profit-oriented companies (Henry and Tysiachniouk 2018). In this study, large-sized leaseholders accounted for the majority of minor and major NCs. These companies are financially able to carry out more logging operations and, thus, more likely to commit a NC. Similar findings on the occurrence of NCs within Principle 6 have been reported in the literature (Hain 2012; Lewis and Davis 2015; Halalisan et al. 2016). A study by Tysiachniouk and McDermott (2016) examined Principle 9 of the FSC standards and concluded that while FC may have improved the protection of HCVF, it has failed to address the needs of local communities, the competitiveness of small- and medium-sized forest companies, may have increased the price of fuel wood, and decreased local access to sawnwood and building materials. Many of these issues are indeed related to Principle 3 and Principle 4. Moreover, the dependence of local communities on the financial and employment support of a company has resulted, in some cases, in misinterpretation of FC standards and principles (Matilainen 2013).

5 CONCLUSIONS

The FC process in the Russian Federation has spread rapidly but unevenly. It has gone through a period of criticism and opposition based on regional differences and non-transparent policymaking. Nonetheless, it is believed that FC, as a non-state and market-driven process, has brought new forms of governance to Russian forestry and Russian timber companies, particularly large timber companies. Depending on various socio-economic, political and demographic variables, stakeholders and timber companies of various sizes perceive FC differently but see it as a genuinely new economic and market initiative to explore new markets and increase profits. As in many other countries, the level of awareness, the costs and process inclusiveness remain challenging checkpoints that need to be addressed thoroughly by both research and regular forms of constructive dialogue, open negotiations, and wider inclusion of local communities, NGOs and regional/local authorities. The timber tracking system employed by each company is unique and effective provided improvements and updates are regularly implemented, and the system is based on practical experiences. The demand for more finished and semi-finished wood products for construction, furniture, paper, and energy will lead to increasing demand for Russian timber. Thus, FC will likely expand in the country. However, the short and long-term impacts on the functionality, resilience and viability of forest ecosystems will lead to more perplexing issues, which will further challenge the certification schemes, at least in the Russian case.

In regard to this thesis, we can accept null hypothesis 1 as the size, location, and market orientation of the forest companies appear to have an influence on the willingness of the company to adopt FC, compared to small-sized forest companies who perceive the costs of FC as a barrier to the adoption of FC standards. On other hand, we can reject null hypothesis 2 as this study has shown that the number of NCs has indeed increased as the number of issued certificates have increased, regardless of the size and/or location of the company. Last but not the least, complex geopolitical events, climate change, the rise of protectionism, the speed and manner that global energy systems are evolving, and sanctions are some contemporary issues with unpredictable effects on forests, illegal logging and FC in Russia and worldwide.

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