Understanding illegal logging in Ghana: A socio-legal study on (non)compliance with logging regulations

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AFLEG	African Forest Law Enforcement and Governance
CA	Concessions Act
CBD	Convention on Biological Diversity
CITES	Convention on International Trade in Endangered Species of Fauna and Flora
CO	Concessions Ordinance
DA	District Assembly
DCE	District Chief Executive
DM	District Manager
EA FLEG	East Asian Forest Law Enforcement and Governance
ECOWAS	Economic Community of West African States
EU	European Union
EU-FLEGT	European Union Forest Law Enforcement Governance and Trade
FAO	Food and Agricultural Organisation of the United Nations
FC	Forestry Commission
FD	Forestry Department
FG	Forest Guard
FO	Forest Ordinance
FLEGT	Forest Law Enforcement, Governance and Trade
FPA	Forest Protection Act
FR	Forest Reserve
FSD	Forest Services Division of the Foresrty Commission
G8	Group of Eight Highly Industrilised Nations
GDP	Gross Domestic Product
GSBA	Globally Significant Biodiversity Area
GSS	Ghana Statistical Services
GoG	Government of Ghana
ITTA	International Tropical Timber Agreement
IUCN	International Union for Conservation of Nature
LI	Legislative Instrument
LIF	Log Information Form
LM	Logging Manual
LMCC	Log Measurement and Conveyance Certificate
MCPFE	Ministerial Conference on the Protection of Forests in Europe
MDGs	Millennium Development Goals
MMDAs	Metropolitan, Municipal and District Assemblies
MP	Member of Parliament

NGOs	Non-Governmental Organisations
NIFL	National Indicative Felling Limit
NRCD	National Redemption Council Decree
OFR	Outside Forest Reserve
RMSC	Resource Management Support Centre of the Forestry Commission
RS	Range Supervisor
RWE	Round Wood Equivalent
SP	Salvage Permit
SFM	Sustainable Forest Management
TIDD	Timber Industry Development Division of the Forestry Commission
TIF	Tree Information Form
TRMA	Timber Resources Management Act
TRMR	Timber Resources Management Regulation
TUC	Timber Utilisation Contract
TUP	Timber Utilisation Permit
UNEP	United Nations Environment Programme of the United Nations
VPA	Voluntary Partnership Agreement

1 Introduction

The importance of forests worldwide cannot be overemphasised. Apart from their intrinsic value, forests provide valuable ecosystem goods and services to humanity, including climate moderation, biodiversity conservation, habitat protection, medicine, clean water, aesthetic and spiritual values, food and timber. In spite of these benefits, forests degradation and deforestation continue to be on the rise globally particularly in the context of developing countries. Illegal logging is recognised worldwide as a major cause of forest degradation and deforestation, which accounts for about 20% of terrestrial carbon dioxide emissions that cause global warming (UNEP, 2011). Illegal logging could also negatively impact on food security and livelihood of forest dependent communities, social cohesion, deprive governments of revenue and erode countries' natural resource bases.

Regulation of human activities is central to sustainable forest management. This is because human beings are directly responsible for most of the drivers of forest degradation and deforestation. Consequently, public institutions at the global, regional and national levels have enacted and implemented several policies and laws to regulate human activities in relation to the forests with the view to ensure that they are protected, conserved and utilised sustainably. However, evidence of noncompliance with these policies and laws is common globally resulting in serious environmental, social and economic consequences (Tacconi, 2007).

Nonetheless, compliance has received relatively little attention compared to other aspects of forest conservation including regulatory and enforcement interventions. In a general sense, 'compliance' refers to rule conformance or adherence. This book is about compliance, and seeks to understand why regulated actors in the logging industry obey or violate regulations. According to Parker and Nielsen (2009), the study of compliance helps to understand, explain, and predict how and why those who are objects of regulation respond to it and what effect it has on them. This study draws on a vast array of literature including economics and sociology. Such a perspective is key if we want to end violation and/or improve compliance.

This study focuses on the compliance-violation behaviour of logging actors with respect to logging rules that prohibit illegal logging. In Ghana, various measures meant to protect forests against illegal logging have failed to yield the desired results. This suggests fundamental weaknesses inherent in these measures and thus raises some pertinent questions. Why does illegal logging persist in spite of all the attempts made or are being made to halt the practice? What influences the main logging actors' decisions to

comply with or violate logging regulations? How do enforcement practices by the main state institution influence compliance behavior of the logging actors? And, can low levels of compliance and effective enforcement be explained by characteristics of the country such as poverty and fragile state institutions?

This book adopts a compliance perspective to investigate and offer explanations to these critical questions with the view of helping policymakers, practitioners and researchers to better understand (and/or influence) factors that shape and sustain low levels of compliance with logging regulations in Ghana. This book also recommends some policy interventions for Ghana and other developing countries where compliance with enacted laws on natural resource management remains a challenge.

1.1 Background to the research

This subsection looks at the forest resources situation, an overview of the timber industry and illegal logging in Ghana.

1.1.1 Ghana's forest resources situation

Globally, it is estimated that forests (all the major types-boreal, temperate and tropical) cover 4 billion ha equivalent to 30% of the earth's terrestrial ecosystem (FAO, 2016). The distribution across the major regions is as follows; Asia (including Asian Russia (31%), South America (21%), Africa (17%), North and Central America (17%), Europe (9%) and Oceania (5%).

In Ghana, forests cover about 9.34 million ha representing about 40% of the total land area (FAO, 2015). There are two broad vegetation zones namely, the tropical high forest (closed forest) zone occurring in the south-western part and the savannah (open forest) covering the two-thirds northern part of the country. About 2.6 million ha (i.e., 1.8 million ha in the closed forest zone and 0.8 million ha in the open forest zone) is gazetted as permanent forest reserves and dedicated to forestry activities where no other land use is permitted (Adam *et al.*, 2006). In terms of biodiversity, the forests are very rich with about 800 birds species, of which 65% are resident and about 2% globally endemic (IUCN, 2013). They harbour about 330 medium-large terrestrial mammals including 4 endemic, 8 vulnerable and 15 near threatened (IUCN, 2013). There are over 5000 plant species with 121 threatened including 3 (*Talbotiella gentii, Salecia fimbrisepala and Aubregrinia taiensis*) critically endangered and endemic to Ghana (IUCN, 2013). These species are specially protected in thirty designated forest reserves covering an area of about 130,000 ha labelled 'Globally Significant Biodiversity Areas' (GSBAs).

The forests play critical roles in soil conservation, carbon sequestration, water cycle, habitat protection, biodiversity conservation, maintenance of favourable climatic conditions for the growth of major agricultural crops

and, food and livelihood support to over two million people out of the estimated 26 million population of Ghana (GoG, 2012). Additionally, the forests supply products including fuel wood which serves as the main energy source for about 65% of the population particularly the rural dwellers and, timber for domestic and export trade.

For management purposes, the forest reserves are broadly divided into two; production forest reserves, where regulated or controlled logging is permitted and protection reserves, where no logging is allowed but managed solely for biodiversity conservation and other environmental purposes. The remaining areas are collectively termed outside forest reserves (OFR) where other land uses are permitted.

In Ghana, about 95% of the forest lands are owned by the various traditional authorities or chiefs with the remaining 5% being property of the State (Birikorang and Rhein 2005). However, it is the State that manages all the forests and naturally occurring timber trees in trust for the owners.

Apart from the natural forest, Ghana has forest plantations of about 265,000 ha, made up of both native and exotic species but the bulk is exotic particularly *Tectona grandis* (FC, 2016). Majority of the plantations is located in forest reserves, owned and managed by the State. A minor part is owned and managed by private individuals and corporate entities.

Traditionally, timber harvesting has been part of forest management practice in Ghana. Legally, timber harvesting takes place in both the production forest reserves and outside forest reserves. Private logging firms exploit the timber under a licensing system and the resultant revenue is shared between the State and the land owners based on a formula in the 1992 Constitution of Ghana. In terms of timber production, there are some 800 tree species that grow to timber size of 50 cm diameter at breast height (dbh). However, about 95 timber species are exported with less than 20 of them accounting for over 80% of all exports from Ghana as at 2011 (Affum-Baffoe, 2011).

It is evident from the above that the forests of Ghana serve three main functions; ecological services, livelihood support for forest-dependent communities and economic prosperity through timber exploitation and trade. For most developing economies, the governance challenge is how to balance these three functions (that can be potentially conflicting) in such a way that the forests do not depreciate in quality and quantity. In other words, how do governments ensure that forests provide all these three goods and services to meet the needs and aspirations of both the present and future generations without deterioration in quantity and quality? In this regard, ensuring compliance with forestry sector regulations that seek to achieve sustainable management is critical.

1.1.2 Timber industry in Ghana

FAO (2016) estimated that the volume of industrial round wood production worldwide at 1,874 million m^3 in 2016. The break down across the major

regions of the world was as follows; 32% in Europe (including the Russian Federation), 27% in North American (USA and Canada), 24% in Asia and the Pacific, 13% in Latin America and the Caribbean (13%) and 4% in Africa (FAO, 2016).

In Ghana, international timber trade started in 1883 when the first exports of logs from the then Gold Coast were shipped to Europe (Logman, 1945; Taylor, 1960). Since then the timber industry has expanded tremendously. It now has about 200 licensed logging and milling/processing firms. The timber industry in Ghana consists of formal and informal timber producers. The formal actors (i.e., licensed logging firms) are those firms licensed/registered under the laws of Ghana to undertake both upstream and downstream timber operations. The upstream operations include harvesting timber from the natural and plantation forests whilst the downstream activities involve the primary, secondary and tertiary processing of logs to semi-finished and finished timber products.

Logging firms in Ghana are privately owned business entities. The majority of the firms is Ghanaian-owned but the large-scale firms are predominately foreign-owned. In terms of trade outlets, Ghana exports to every continent. For instance, based on the 2015 timber export statistics, the distribution of timber products by volume from Ghana across the five major market regions is as follows; Asia/Far East (58%), Africa (19%), Europe (15%), Middle East (5%) and the Americas (3%) (TIDD, 2015). The industry significantly contributes to the socio-economic development of the country. Annually, the industry brings in some USD 300 million in foreign exchange (from exports of about 0.5 million m^3 of mainly secondary processed wood products) and directly employs about 100 000 persons (GoG, 2012).

The informal timber sector consists of unregistered individuals and groups who have no license or legal locus to engage in timber harvesting business but do so underground and harvest even more volume than the licensed logging firms (Hansen and Treue, 2008; Marfo, 2010). A major part of the illegal harvest is done by the chainsaw operators who use fuel-powered chainsaw machines to illegally harvest trees and convert them in-situ to lumber for commercial purposes (a banned practice under the Timber Resources Management Regulations (TRMR, 1998)). Nonetheless, they continue to operate in virtually every forest area and employ an estimated 97,000 persons along the entire production and marketing chain (Marfo and Acheampong, 2011). Additionally, a minor part of the illegal harvest consists of the canoe carvers, who harvest mainly *Triplochiton scleroxylon* (Wawa) species to carve canoes for fishing and transportation (Boakye, 2015).

In terms of trade, chainsaw lumber accounts for about 1.1 million m^3 (i.e., 72% of the annual national production) of lumber traded on the domestic market valued at GhC 544.39 million[1] based on the average market price of GhC 494.00/m^3 for all species (Marfo et al, 2017). Though to a relatively

1 Ghanaian cedi (GhC) (3.80=1.00 USD) as at 2014

smaller extent, some of the illegal products are offloaded directly within the Economic Community of West African States (ECOWAS) sub-regional market, others are mixed up with legal products and traded on the international market.

1.1.3 Illegal timber harvesting

Globally, it is estimated that about 30% of the annual volume of timber is harvested, transported, processed and traded in violation of national laws (World Bank, 2012). This practice went on for several decades without much public outcry about its adverse impact on human well-being and other ecosystem support services. However, since the 1980s the subject has attracted worldwide attention due mostly to the growing awareness about the adverse environmental, social and economic impacts of illegal logging and its associated ilicit trade. For instance, in 1998, the G8 countries developed an 'Action Program on Forest' to address forest policy and management problems including illegal logging (Eberhardt, 2013). This has been followed by the East Asian Forest Law Enforcement and Governance (EA FLEG), the African Forest Law Enforcement and Governance (AFLEG) and the EU Forest Law Enforcement, Governance and Trade (FLEGT) Action Plan. The main thrust of all these initiatives is to intensify national efforts and strengthen bilateral, regional and multilateral collaboration to address forest violations **(**Eberhardt, 2013**).** Despite all these international and national efforts to address illegal logging and its associated trade, the practice persists thus raising concerns for forest managers and governments worldwide.

Studies that have investigated illegal logging in Ghana could be put into three different groups. The first group has looked at the general causes and adverse impacts of illegal logging. For the causes, the results revealed flawed policy and legal framework, weak enforcement and land and tree tenure problems, poor farming practices and population pressures among others while the adverse impact ranged from environmental through social to economic (Blay et al., 2007; Odum, 2004). Second group of studies including Marfo and Acheampong (2011) and, Obiri-Darko and Damnyag (2011) examined the socio-economic context of illegal logging particularly its contribution to the economy in terms of employment, livelihood and infrastructural support to the forest fringed communities They found that illegal logging helps to create jobs, sustain rural economies and livelihoods. Third, there are also studies that considered the extent of illegal logging by both the licensed logging firms and chainsaw operators. The results estimated the annual timber harvest at between 2.7 million m^3 and 3.5 million m^3 (Birikorang et al., 2001; Hansen and Treue, 2008).

Illegal logging accounts for about 70% of annual timber production in Ghana and it is undertaken by both the licensed logging firms and chainsaw operators (Hansen and Treue, 2008). Among the licensed logging firms, illegal logging takes diverse forms including harvesting timber in excess

of the approved yield, harvesting in areas beyond the limits of approved TUC or salvage permit and harvesting with expired documentation. The illegal chainsaw operators, mostly operate at night and non-working hours in virtually every forest area they could find. Most of them are armed and ready to attack any person including forestry officials who dare to confront them. They also use informants stationed at vantage points to alert them of any approaching danger.

The problem has far reaching implications for many stakeholders both in-country and beyond. For millions of forest-dependent communities whose livelihood and sustenance are intertwined with the forests, illegal logging may be a huge challenge when daily they see their very existence being eroded. Also, for large-scale pharmaceutical and allied industries that depend on the forests for their raw materials, illegal logging and associated forest loss could be a big blow/nightmare. Furthermore, for the development partners in the West who spend millions of dollars annually in development assistance to help protect and manage the tropical high forest, illegal logging signals funds gone waste. Similarly, for the ecologists and environmental scientists who are confronted with the challenges of global warming and its adverse impacts, any practical measures at reducing greenhouse gas emissions including protecting the tropical forest from illegal logging, would be welcome. Moreover, for eco-tourists, conservationists, and environmental groups who want to have pristine forests for their aesthetic values and whatever is worth, illegal logging is a huge disappointment because their expectations may never be met. These are just a few examples to demonstrate that illegal logging is a huge problem.

As part of the measures to tackle this menace, Ghana has adopted various policies and legal instruments including the 2009 voluntary partnership agreement (VPA) with the EU under the EU VPA/FLEGT aimed at ensuring that only legal timber is produced and traded on both the domestic and international markets. Nonetheless, the problem persists, raising questions about the effectiveness of the measures being rolled out to address the problem.

1.2 Understanding compliance with logging regulations

Understanding compliance is key to regulating human behaviour which is the foundation of a functioning society (Arias, 2015). According to Levi et al. (2008), without compliance, there is no rule of law, no matter how well the institutions and regulations are designed. They further stated that regulatory institutions unable to motivate regulated actors to generally refrain from law-breaking are unlikely to survive in the long run. A major problem facing most regulatory institutions in natural resource-endowed developing economies is how to establish and sustain compliance with enacted regulations. Understanding why regulated actors comply with and/or break rules is therefore key to helping to address the problem of noncompliance with enacted laws.

In this context, compliance is used to denote adherence to rules related to logging. According to Arias (2015), compliance can be interpreted as dichotomous or as a gradation of behaviour. As a dichotomy, the term compliance refers to whether a person or an entity adheres to rules or not. Here, compliance and noncompliance are opposite and do not allow intermediate values. As a gradation, it refers to the degree of adherence to rules, as when a person breaks some of the rules but not all, or respects rules most of the time, but not always. A gradation of compliance could be represented by continuous values or categories such as high, medium or low (Arias, 2015). For the type of rule under study, the latter interpretation is adopted as it allows for investigation into compliance variations among the different actors.

As already noted, illegal logging is a huge problem in Ghana. However, it should be stressed that timber harvesting in Ghana is extensively regulated and that the problem of illegal logging is not lack of regulations (and/or their weak enforcement) but basically a low level of compliance. To address the problem of low compliance, it is important to understand the perspective of those who violate the law. In other words, to be able to halt any bad or undesirable behaviour, it is imperative to understand those who engage in that sort of behaviour. Similarly, to improve compliance among regulated actors, it is critical to understand the perspectives of those who comply with the law and those who violate it.

Research suggests that there are three broad perspectives to understanding why actors comply with or violate regulations (Kagan and Scholz, 1984; May and Winter, 2001). The first perspective basically views compliance as a rational choice, motivated by economic/financial considerations (Yapp and Fairman, 2004). The underlying assumption with this perspective is that, actors, as rational beings, will comply with regulations only when they believe that the compliance costs are exceeded by the cost of legal penalties for violation (Becker, 1968; Thornton et al., 2009). Put differently, laws that bring more benefits than costs for regulated actors will be readily complied with and vice versa.

The second perspective focusses on regulated actors' capacity to comply with a given law. Scholars maintain that some instances of violation are not necessarily due to cost-benefit calculations but because of impossibility of actors to comply (Coleman, 1987; Kagan and Scholz, 1984; Winter and May, 2001). According to Huisman (2001), regulated actors lacking the financial, technical, logistical and human resources necessary to comply with a regulation are more likely to violate it. As he notes, violation of the law following this perspective is not being able to comply instead of not willing to comply. Here, compliance is more about ability than motivation.

The third perspective deals with the moral and social dimensions of compliance. Existing literature indicates that compliance has a moral and social dimension beyond the economic calculations and capacity to comply. Studies have shown that actors are more likely to comply with regulations they morally agree with, as well as those they believe others should comply with (so-called injunctive social norms) or those they believe others adhere

to (so-called descriptive social norms) (Cialdini, 2007; Tyler, 2006). Generally, these three perspectives provide a useful insight into understanding why actors comply with or violate regulations but do not exhaustively explain all instances of actors' compliance and violation behaviour. The conceptual framework (section 1.4) examines other motivations on compliance behaviour outside these three broad perspectives.

Within the logging industry in Ghana, some previous studies on compliance examined farmers' compliance with forest rules that regulate timber harvesting on farmlands. (Ramcilovic-Suominen and Hansen, 2012). The findings indicate that economic considerations primarily explain the low compliance with timber harvesting rule. Again, Hansen (2011) studied legal compliance in the case of on-farm timber extraction with rules that require timber operators; to obtain prior and informed consent from the farmers, to pay appropriate and timely compensation for crop damage during timber extraction and chainsaw milling. The study attributed the low level of compliance in all the three domains to both economic motivations, and regulations perceived to violate moral values.

However, these studies do not adequately explain how loggers in Ghana make decisions about whether to obey or break timber harvesting regulations. This study will further this understanding. The study, thus, attempts to provide a deeper understanding of what influences logging actors' decisions to comply with or break the regulations on logging. It is believed that understanding how logging actors in Ghana think and make decisions about compliance could prove useful in the design of effective regulations to improve compliance in Ghana and beyond.

1.3 Research questions

This subsection introduces the main research questions addressed in this book. The three main questions are as follows;

i. What influences loggers in Ghana (i.e., licensed logging firms and chainsaw operators) in their decisions to comply with or violate logging regulations?
ii. How do enforcement practices of the Forestry Commission contribute to compliance-violation behavior of loggers in Ghana?
iii. What are the broader theoretical and empirical implications from this study for forest regulation, regulatory enforcement and compliance in Ghana and other developing countries?

The first research question is addressed in chapters three and four. The second research question is answered in chapter five. The third research question is addressed as part of the concluding chapter six.

1.4 Conceptual framework

To put this study on compliance of logging regulations in Ghana in a broader socio-legal perspective, it is useful to give an overview of the underlying theories that explain compliance behaviour generally. The framework integrates a number of theories including those from the fields of economics, sociology and psychology.

What influences compliance-violation behaviour among regulated actors can be explained from different perspectives including economic, social and moral motivations. Standard economic theory holds that firms, as profit-seeking entities, will comply with regulations only when they believe that the compliance costs are exceeded by the cost of legal penalties for violation, discounted by the probability that violations will be promptly detected and punished (Becker, 1968; Thornton et al., 2009). The economic literature thus predominantly views compliance as a decision motivated by financial consideration within the rational choice theory (Yapp and Fairman, 2005). Various empirical studies, ranging from farmers compliance with agro-chemicals (Yan et al., 2015; Winter and May, 2001), through fishers compliance with fisheries regulations (Raakjaer Nielsen and Matthiessen, 2003) to firms compliance with industrial pollution (Rooij, 2006; Kagan et al., 2011) have found evidence in support of deterrent effect of perceived detection risk and sanction severity on compliance behaviour. Research shows that the deterrent effect of perceived detection risk and sanction severity does not originate from the state regulators only but also from anticipated negative reactions by consumers, NGOs and civil society groups among others (Thornton et al., 2009). With this theory, the assumption is that compliance behaviour can be promoted by increasing enforcement and/or provision of tangible incentive systems.

Evidence in regulatory literature indicates that the conventional economic theory does not adequately explain all instances of compliance particularly in situations where the potential illegal gains are huge and enforcement is intermittent or non-existent (Kagan et al., 2003; Sutinen and Kuperan, 1999). For instance, Sutinen and Kuperan (1999) reported that many fishers in Malaysia comply with fishing regulations despite large potential illegal gains and small expected sanctions. In this instance, it was a moral or an internal obligation to follow one's own sense of what is right that made them comply. This clearly demonstrates that there are other motivations, aside from detection and fear of legal sanctions that also shape compliance behaviour in regulated entities. One of them is social pressure. The desire of individuals and regulated firms to earn the approval and respect of significant others as a motivation for compliance is well documented in sociological studies (Cialdini, 2007; Grasmick and Bursik Jr., 1990).

In their Danish agro-chemical regulations studies, Winter and May (2001) found that social motivations were influential in enhancing compliance among farmers. Also, Sutinen and Gauvin (1998) reported in their Massachusetts lobster fishery research that peer-pressure and informal

sanctions accounted for most of the compliance observed. The fear of adverse publicity on firms and importance of maintaining good reputation have also been found to shape compliance behaviour of firms (Fisse and Braithwaite, 1983). In an interview with executives of large corporations, Ayres and Braithwaite (1992) reported that both individual executives, and the corporation collectively valued good reputation or status in the community they operate as priceless assets. They observed that a negative publicity, in turn, can result in financial losses and erode the reputation of the firm and individual managers.

Another motivation revealed in literature to foster regulatory compliance is the normative commitment based on the internalised values of the regulated actor. May and Winter (2001) have argued from this perspective that the normative willingness to comply with a given regulation is determined by the regulated actor's general moral principles or one's sense of civic duty and/or religion to obey laws. Thus, legal norms that resonate with one's personal beliefs and values are more likely to be complied with than those that are not. Similarly, rules that become or are internalised into morals produce the deepest form of compliance, in the sense that violating such norms means violating one's own morals (Grasmick and Bursik Jr., 1990; Vandenbergh, 2003). The internalisation of norm poses another kind of potential cost or punishment of violating the law; the threat of guilt feeling or shame for doing something which the actor considers morally wrong (Grasmick and Bursik Jr., 1990).

Also, studies suggest that most people obey regulations emanating from authorities and institutions that they trust (Tyler, 1990; Levi et al., 2008). Here, compliance depends on actors being satisfied with the law-making processes (including participation, openness and accountability), the content and the outcomes of the decisions made by the authorities, in terms of consistent interpretation and fair application of the law (Honneland, 1999; Tyler, 1990). They suggest measures that include procedural fairness, joint or co-management, negotiation and other forms of cooperation between regulators and regulated actors to improve legitimacy.

Moreover, compliance literature reveals other motivations outside the three main ones presented above (i.e., economic, social and normative) that shape compliance-violation behaviour. For instance, Hutter (1997) and Yapp and Fairman (2005) have shown that regulators' enforcement style in the sense of attitude towards and/or treatment of regulated actors, cost of compliance in terms of money and time, managerial incompetence, misunderstanding of rules, improper attention to regulatory requirements and system failures influence compliance behaviour. However, Coleman (1987) observed that some instances of violation have nothing to do with motivation but the regulated actors' lack of capacity to comply. In this case, rules that require the impossible or are difficult to comply with will lead to more violation. With this perspective, Huisman (2001) explains that, violation of law derives from inability to comply instead of lack of motivation to comply. Studies have identified other factors including poverty,

livelihood needs and socio-politico-cultural considerations as accounting for non-compliance with regulation particularly in developing countries (Ostermann, 2016; Boittin, 2013; Rooij, 2006).

Empirical evidence suggests that for firms, compliance with the law is closely related to size (Huisman, 2001). One strand of literature suggests that large scale firms comply better because they are more visible to, and more closely scrutinised by, regulators, consumers and advocacy groups, are more likely to have in-house specialists in regulatory issues, have the financial resources to undertake expensive control measures, and are more concerned about building and protecting their social and political reputation (Genn, 1993; Thornton et al., 2009). Another strand of literature indicates that larger firms can use their influence and power to postpone or evade compliance or to protect them against enforcement, particularly if they happen to be dominant employers- in the sense of being responsible for a significant amount of income in a given area (Huisman, 2001; Vaughan, 1983). A study by Wells (1996) about industrial pollution in Brazil and Mexico indicates that small plants pollute more per unit of output, and because of their small size have more difficulty reducing and complying with regulation.

Within the forestry sector in the developing economies, only a few studies have applied these theories to explain how and why forest sector actors comply with or violate the related laws (Contreras-Hermosilla and Peter, 2005; Schmidt and McDermott, 2015; Tacconi, 2007). These studies point to the crucial role of contextual factors including, bureaucratic and stressful legal processes, high demand for timber products, corruption, flawed policy and legal framework, livelihood needs, poverty and low enforcement capacity in shaping noncompliance behaviour. In the Ghanaian context, even less is known about how compliance theories help to explain compliance-violation related behaviour of the various forest sector actors. The present study draws on data obtained through in-depth semi-structured interviews with loggers in Ghana with the view of understanding their compliance-violation behaviour with respect to Ghanaian timber harvesting regulations.

1.5 The legal regime on timber harvesting in Ghana

There are several laws that regulate timber business in Ghana. For this study, the relevant regulations examined for compliance are the Forest Protection Act (FPA), 1974 (NRCD 243), the Timber Resource Management Act (TRMA) 1997, (Act 547) and its operative legislative instrument, the Timber Resources Management Regulations (TRMR) 1998, (LI 1649). Additionally, there are other regulations contained in the logging manual that sets out well-defined standards that logging firms are expected to comply with (FC, 2005).

According to section 1 of the FPA (1974), it is illegal for any person to source, harvest, transport, process and trade in timber products without a written authorisation from the Forestry Commission (FC), the main

regulatory agency for the protection, management and utilisation of forest resources in Ghana. The prescribed sanction for any person or logger who contravenes this enactment is the payment of twice the commercial value of each tree illegally harvested or procured. The Act further provides that any person or logger convicted thrice under the regulation should be prohibited from holding a timber harvesting right. However, there is no evidence that it has ever been implemented.

Alternatively, the Logging Manual provides for the payment of a monetary fine of ten times the stumpage value of the trees involved. Here, the logs/trees illegally harvested are restored to the logger once the penalty is paid. In other words, the regulations do not provide for confiscation of the trees after payment of the prescribed fines.

The TRMA and the TRMR were enacted, as part of a broader policy and legal measures to address the wonton destruction of trees by chainsaw operations in Ghana. These enactments make it an offence for any person who, without a valid timber harvesting rights, uses a chainsaw machine to harvest and mill in-situ logs into lumber for sale, exchange or any commercial purposes (TRMR 1998, reg. 32). The sanctions are a fine of GhC500.00 or maximum imprisonment of 12 months.

1.6 Research methods

This subsection looks at the study's context, the main actors in the study, data collection instruments, approaches and analysis of the data.

1.6.1 The study's context

The fieldwork was undertaken in Ghana. Ghana is located in West Africa and is bordered by Cote d'Ivoire, Burkina Faso, Togo and the Gulf of Guinea or Atlantic Ocean on the west, north, east and south respectively. Ghana has a total land area of about 238,538 km^2, of which forests cover about 93,400 km^2 (40%) (FAO, 2015). Ghana is known for its social cohesion and stability, relatively weak governance, institutional capabilities, good democratic credentials and progress towards rule of law and human rights (Edgar et al., 2016).

Economically, it attained a lower middle-income status in 2010 and has experienced steady GDP growth of about 8% since 2005, thus making it one of the fastest growing economies in the world (Edgar et al., 2016). For the period 2005 and 2013, it reduced poverty levels by more than half from 57% to 24% and thereby achieving the Millennium Development Goal (MDG) 1 target (GSS, 2014). Despite these achievements, poverty levels particularly among the rural population remain high. The economy still leans heavily on exports of primary products including cocoa, gold and timber. In an attempt to boost its economic transformation agenda, Ghana has experienced degradation of its environmental/natural resources including forests, water, fisheries, and minerals.

Politically, Ghana is a presidential representative democratic republic, meaning the president is both head of state and head of government. The executive power is exercised by the president. In recent times, however, there are increasing pressure from various NGOs and civil society groups demanding greater accountability and transparency regarding how the government exercises its executive powers including those over environmental/natural resources of the country. In other words, there is a gradual shift from the exercise of power by a central government to governance where multiple state and non-state actors influence how power is exercised over the affairs of the state. It is within this context that this study about forest law compliance and enforcement is undertaken.

Ghana is a very good place to examine compliance with logging regulations for various reasons. It has a long history of sustainable forest management dating back to the early twentieth century with the establishment of a Forestry Department in 1909 to protect and manage forest resources. Prior to this (i.e., formal forestry practices by the state), the local communities have used customary laws to protect and manage forests in the form of sacred groves across the country. The country has a good forest cover and vibrant timber industry that supports its socio-economic development. However, the forest cover is dwindling and this is attributed, in part, to illegal logging. This raises question about the degree of legal compliance and/or enforcement in the logging industry.

To deal with the problem of illegal logging, Ghana has signed up to virtually all the regional and international initiatives aimed at the protection and sustainable management of all types of forests. In 2009, it became the first country to sign the Voluntary Partnership Agreement (VPA) with the EU to harvest and trade in only legal timber products on both domestic and international markets. Notwithstanding all these, illegal logging remains a major problem in the country. Research has shown that there is variation both within and across the main logging actors in the extent to which logging rules are obeyed (Birikorang et al., 2007).

1.6.2 Main actors in this study

This study focused on the two main actors in the logging sector namely licensed logging firms and chainsaw operators. The licensed logging firms are registered under the laws of Ghana to undertake legal timber operations but the reality on the ground is that, they comply to some extent and violate to another extent. The chainsaw operators consist of individuals and groups that have no legal mandate to engage in timber operations but do so 'underground'. By definition, they are always in violation of the law.

The choice of these actors is on account of various reasons. They are economic actors with profit-making motivations but are subject to various regulations that restrict their opportunities for financial gains. Second, the high demand for timber products on both the domestic and export markets and profitability of timber trade have increased the temptation to violate the

logging regulations. Third, the vastness of most forest areas and the lower regulatory officials to area ratio presents a huge opportunity for the actors to violate the regulations and finally, decisions to comply with or violate logging regulations are mostly intentional or willful and rarely accidental or a mistake. These attributes of selected regulated actors make them ideal for a study about (non-)compliance, its economic, social, and normative motivations, and the influencing factors behind them.

1.6.3 Data collection and analysis

As in all socio-legal research, a variety of methods are used. These methods vary by the sources from which data is obtained (i.e., primary or secondary), how the data is sampled (including simple random, stratified random and convenient or accidental sampling), the type of instruments used in data collection such as surveys, interviews, focus group discussions, and whether they collect quantitative, qualitative data or both (Leedy and Ormrod, 2013). Below is the general overview of the research methods used to address each of the research questions. Only a summary of the data collection methods and analysis are presented here. The detailed accounts are presented in chapters 3-5.

Research question 1: What influences loggers in Ghana in their decisions to comply with or violate logging regulations?

This study investigates compliance with and violation of logging regulations from the perspective of loggers. According to Gray and Silby (2011), such an approach is important because it describes the way the regulated actors perceive compliance that eventually shape their decision-making process. Also, this study probes loggers compliance-violation motivations and behaviour using semi-structured interviews instead of survey-type approach as used by other researchers including Winter and May (2001). The semi-structured interview approach is particularly useful as it offers researchers the opportunity to ask follow up questions and extract from respondents comprehensive accounts of choices they have to make in their daily work. In this study, such in-depth accounts were generally more illuminating of how the actors decide to comply with or break the logging regulations and the challenges they face, which form the primary object of this study, than direct survey-type questions probably would reveal (Thornton et al., 2009).

The study relied on accidental or convenient sampling technique to select the respondents. This technique was adopted due to the sensitive nature of the topic and the fact that the researcher is a known regulatory official. In this case only those actors willing and capable to discuss this somewhat sensitive subject matter were interviewed. Additionally, for chainsaw operators, the snowball sampling technique was used to identify and select respondents. According to Benard (2011), this technique is useful

in studies of difficult-to-find respondents. The first couple of respondents were introduced to the researcher by chainsaw milled lumber vendors. Subsequently, these chainsaw operators gave information about other chainsaw operators. In all 78 interviews were conducted. This is made up of 40 chainsaw operators and 38 respondents from twelve logging firms.

As in all compliance-violation studies, a major obstacle is respondents' bias including deceitful responses (Nielsen-Parker, 2013; Yan et al., 2015). In this study in particular, the fact that the researcher is a regulatory official could trigger such biases. Several approaches were used to reduce this obstacle. They included ensuring anonymity or confidentiality, underlining the importance of accurate data and using face-to-face interviewing technique that enabled the researcher to further analyse the demeanour of the respondents aside from their responses. Again, for practical reasons including time and funding constraints, this study is based on sample sizes that cannot lay claim to representativeness of the actors involved and that obviously challenges generalization of some of the research findings, especially beyond the Ghanaian context. Further research would therefore be required in these areas to validate and consolidate some of the findings presented. Nonetheless, small sample size allowed enough time to extract from respondents comprehensive accounts of choices they make on a regular basis in deciding whether or not to comply with the law, which is the main object of this study. Detailed accounts of sampling, compliance measurement, limitations and measures adopted to minimise deceitful reporting are presented in the methods sections of chapters 3 and 4 on logging firms and chainsaw operators respectively.

Research question 2: How do enforcement practices of the Forestry Commission contribute to compliance-violation behaviour of loggers in Ghana?

This research question seeks to have a deeper understanding of the enforcement activities of the Forestry Commission, and how they contribute to the compliance-violation behaviour of loggers in Ghana. To achieve this, fifty (50) in-depth qualitative interviews involving frontline or street-level bureaucrats directly engaged in forest law enforcement duties were conducted. The focus on frontline officials was important because they directly interact with the regulated actors, who are the objects of enforcement action. However, in the field of regulatory enforcement, few studies have explored the role of street-level bureaucrats (May and Winter, 1999; Nielsen, 2006; Seva and Jaggers, 2013).

The frontline regulatory officials are, in a hierarchical order, the District Managers (DM), the Range Supervisors (RS) and the Forest Guards (FG). Respondents were selected through stratified random sampling technique. This approach was important to ensure that all the three key subpopulations constituting the frontline regulatory officials are included and their distinct roles captured (Bernard, 2011). All respondents have had at least five years of enforcement experience.

The primary data was collected through a semi-structured interview technique that uses a pre-determined interview guide containing a set of open-ended questions derived from the framework used and the research objectives (Bernard, 2011). The researcher's knowledge and understanding of the regulatory agency as an enforcement official for over twenty-five years helped in couching very specific main and follow-up questions that drew upon responses by other respondents.

In regulatory research, every data source used (i.e., surveys, interviews, participatory observations or official data) has its own challenges. For qualitative interviews used as the main data collection instrument here, the major challenge is the likelihood of untruthful reporting (Parker and Nielson, 2009). In this particular study, where the researcher doubles as regulatory official, the prospect of respondents and/or researcher bias was high. While it is impossible to completely eliminate interview bias in a study of this nature, the following measures were used to decrease it in many respects. First, respondents were promised anonymity and assured that the purpose of the study was purely academic and not a fault-finding mission. Second, the researcher obtained prior and informed consent from each respondent. In other words, all respondents participated voluntarily and were guaranteed the freedom to decline response to questions they were uncomfortable with. Third, the questions asked were very factual and bordered directly on the daily challenges they encounter in their operations. Finally, the face-to-face conversational interviewing approach adopted allowed for further invaluable analyses of the demeanour of respondents aside from their responses.

Actually, some scholars including McKenney et al. (2006) have argued that, being an outsider to a research context helps to promote a greater degree of objectivity which may not be possible for researchers who are insiders. Therefore, to improve objectivity, the researcher adopted the following measures. First, the findings of the study have been widely shared with colleague researchers, practitioners and some of the respondents for critique and feedback to deal with all biases and ethical issues and second, the researcher sought and obtained prior consent and approval from employers to undertake the study. It is also important to mention that the researcher's insider position came with access to lots of information and contacts with different staff that would have proven difficult for an outsider researcher to secure. These contacts and information proved useful and beneficial throughout the data collection processes. In particular, it helped the researcher to validate or triangulate information obtained from respondents.

Data analysis

The responses from the interviews were subjected to thematic analysis, which helps to identify, analyse and report patterns or themes within data. This approach is useful due to its flexibility in describing data in rich and complex manner (Braun and Clarke, 2006). For this study, the themes were

based on the research questions and the theoretical framework with which the researcher initially had entered the research field, and those empirical findings that fall outside this framework. This study therefore combines deductive and inductive approaches in the result analysis. For each important aspect of the study, the most illustrative quotes are stated. However, such quotations are not necessarily the position of all the participating actors.

1.7 Organisation of the book

This book contains six chapters: chapter one provides the introduction, chapter two reports on the results of an extensive desk study, chapters 3, 4 and 5 present results, discussions and recommendations of the original empirical research and the last chapter, a conclusion. The topic and content of each chapter is set out below.

The introductory chapter gives a general overview of the study. Chapter 2 assesses the extent of illegal logging by the formal timber sector and its implications for forest law compliance, enforcement and the EU-Ghana voluntary partnership agreement. This chapter maps the scale of illegal logging problem and thus provides a background to the study.

Chapter 3 examines the motivations for compliance-violation with logging regulations among the licensed logging firms. This chapter depicts the variation in compliance-violation levels among the different categories of logging firms.

Chapter 4 seeks to understand the motivations for violating timber harvesting regulations among chainsaw operators, who also are important actors in the forest sector.

Chapter 5 looks at how the main regulatory institution, the Forestry Commission performs its enforcement duties and how that influences compliance behavior of loggers in Ghana.

Chapter 6 concludes with the main findings and insights, and their implications for theory and for forestry regulation, compliance and enforcement.

2 Estimation of illegal logging by the formal timber sector in Ghana: implications for forest law compliance, enforcement and EU-Ghana voluntary partnership agreement

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2.1 Introduction

The subject of illegal timber logging, particularly in the context of tropical high forest has been high on the international agenda for the last couple of decades. A lot of scholarly articles have been published on the subject (e.g., Brack, 2003; Kaimowitz, 2003; Tacconi *et al*., 2003; Tacconi, 2007). Similarly, environmental or green groups, the civil society as well as national governments and international organisations have all expressed deep concerns about the increasing rate of loss and degradation of the tropical high forest through illegal harvesting and illicit trade. These concerns are not misplaced, judging from the obvious financial, social, ecological and environmental consequences of tropical forest degradation and deforestation. Continued deforestation and forest degradation pose a major threat to the economies of countries where forests and related resources are significant contributors to socio-economic developments and to the livelihood of the many communities that depend on the forests, as is the case in many developing countries (Ochieng *et al*., 2013). Globally, deforestation is seen as one of the main causes of global warming. In Ghana, illegal logging has been identified as one of the major causes of forest loss and degradation (Appiah *et al*., 2007, Blay *et al*., 2007, Hansen and Treue, 2008; Marfo, 2010; Osei-Tutu, 2010).

But what exactly is illegal logging? One of the major problems involving discussions on illegal logging is the lack of a universally accepted definition on the subject (MCPFE, 2007). In the Ghanaian context, like elsewhere, illegal logging takes place when timber is sourced, allocated, harvested, transported, processed and traded in violation of national laws (GoG-EU, 2009). For the purpose of this paper, any timber harvested and/or transported outside the prescribed number, species and volume of trees by a competent forest authority is deemed illegal (FPA, 1974). The selection of the prescribed yield takes into account the annual allowable cut (i.e., the optimal volume of timber that could be removed annually by all logging firms in Ghana from all the forest reserves).

Illegal logging and associated trade in such products are a problem of both international and national proportions. Consequently, Ghana has rolled out several initiatives in the last half century aimed at dealing with the menace. At the international level, Ghana has ratified a number of conventions/agreements including, the Convention on International Trade in Endangered Species (CITES), the Convention on Biological Diversity (CBD) and the International Tropical Timber Agreement (ITTA). At the regional level, Ghana is a signatory to the African Forest Law Enforcement and Governance (AFLEG) initiative among others. On the domestic front, Ghana has over twenty pieces of principal and subsidiary legislations dealing with forest protection and management. In spite of these legal instruments, the problems of illegal logging and associated illicit trade in such products still continue, raising questions about the effectiveness of these instruments in promoting conservation and sustainable forest management.

In a quest for lasting solution to the problem, Ghana in 2008 signed the Voluntary Partnership Agreement (VPA) with the European Union (EU) to combat illegal logging and strengthen forest governance. The VPA is an instrument of the EU's Forest Law Enforcement Governance and Trade (FLEGT) action plan that aims at ensuring that all timber products from Ghana into the EU are obtained from legally recognized sources (Beeko and Arts, 2010). The objective of the EU-Ghana VPA, consistent with Ghana's own forest sector policy on sustainable forest management, is to contribute to forest law enforcement and governance of Ghana's forest sector. An important part of Ghana's VPA is the establishment of a licensing scheme to ensure that only timber products that have been produced in accordance with Ghana's national legislation (its definition of legal timber) are exported to the EU (GoG-EU, 2009). Under the licensing scheme, timber products from Ghana to the EU will require a valid FLEGT license which would constitute a proof of due diligence on the legality of the timber products concerned. Although the overall objective of the VPA is to ensure that all sources of commercial timber products processed and acquired in Ghana destined for both European Union (EU) and non-EU markets, as well as all timber sold on the domestic market are legal, FLEGT Licenses are, however, only issued for exports to the EU (GoG-EU, 2009).

Ghana will soon issue its first FLEGT license and, evaluation of its success or otherwise as an instrument of controlling illegal logging is to be done annually afterwards (GoG-EU, 2009). Unfortunately, there is remarkably weak empirical data on the extent of illegal logging in Ghana (particularly by the formal sector) upon which any future evaluation could be based. The purpose of this study therefore is to; estimate the level of illegal logging as a basis of determining a reference scenario against which the success or otherwise of the VPA could be measured in future; it will also address the implications of such finding for the general level of compliance with logging rules; and the effectiveness of the current enforcement measures by the Forestry Commission of Ghana.

2.2 Background

This subsection takes a look at the forest resource situation and the timber harvesting regulations in Ghana

2.2.1 Forest resource situation in Ghana

Ghana has two broad vegetation zones namely the tropical high forest (closed forest) zone occurring in the south-western part and the savannah (open forest) in the northern part of the country. In terms of commercial timber harvesting, it is the tropical high forest zone that is of major importance. This zone covers 8.2 million ha in the south-western third of Ghana including 1.8 million ha permanently gazetted as forest reserves and dedicated to forestry activities where no other land use is permitted (Fig. 2.1) (Adam *et al*., 2006; Hall and Swaine, 1976). The forest reserves are broadly divided into two; production forest reserves, where timber harvesting takes place and protection reserves, which are managed for purposes other than timber production. The remaining areas are collectively termed outside forest reserves (OFR) where other land uses are permitted. Legally, timber harvesting takes place in both the production forest reserves and outside forest reserves.

Floristically, the tropical high forests of Ghana have high species diversity of about 2500 including some 800 tree species that grow to timber size of 50 cm diameter at breast height (dbh) (Hawthorne and Abu-Juam, 1995). In Ghana, about 95 % of the forest lands are owned by the various traditional authorities with the remaining 5% held by the State (Birikorang and Rhein, 2005). However, it is the State that manages all the forests and naturally occurring timber trees in trust for the traditional authorities. Private logging firms exploit the timber under a licensing system and the resultant revenue is shared between the State and the land owners based on a formula in the 1992 Constitution of Ghana.

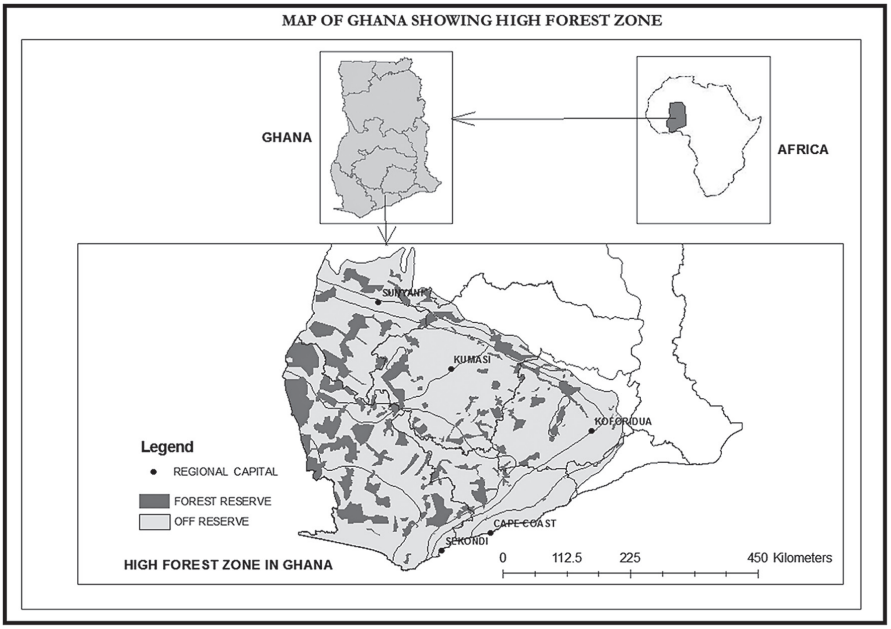

Figure 2.1 Map of the tropical high forest zone of Ghana

2.2.2 Timber harvesting regulations in Ghana

The starting point for harvesting legal timber in Ghana both in forest reserves and off-reserves timber lands is the acquisition of a valid timber harvesting rights. Prior to 1962, the Concessions Ordinance of 1936 (Cap 136) governed the allocation of timber harvesting rights in Ghana. Under this Ordinance, the traditional authorities granted timber concessions and the State, through its special Concessions' Courts, validated them. However, in 1962, the Concession Act, (Act 124) was passed to vest all rights to naturally occurring trees in the President in trust for the various land owing traditional authorities. Additionally, the powers to grant concessions were taken from the traditional authorities and vested in the President. A new system of allocating timber harvesting rights through a competitive bidding process was introduced in 1998 under the Timber Resources Management Act (TRMA) (Act 547) and it's enabling Legislative Instrument, the Timber Resources Management Regulation (TRMR) (LI 1649) to replace the concession system (TRMA, 1997; TRMR, 1998). Under these enactments, three main timber harvesting rights are identified, namely Timber Utilization Contracts (TUCs), Timber Utilization Permits (TUPs) and Salvage Permits (SPs).

A TUC is a written contract between the State and a private logging firm, with the consent of the land owner concerned, that allows the logging firm to harvest timber from a certain area in the contract for a certain time period specified in the contract (ibid). A TUP is granted to rural community

groups, District Assemblies, forest-owning communities and etc to harvest a specified number of trees in an area of land not subject to a TUC. Timber harvested from such areas are for important social or community purposes only and not for sale or exchange (TRMR, 1998). SPs are granted for removal of trees from areas of land undergoing approved development such as road construction, expansion of human settlement and cultivation of farms. All the three types of harvesting rights can be granted in both production forest reserves and off-reserve areas. The procedures for the grant are comprehensively set out in TRMA (Act 547) and TRMR (LI 1649). A further discussion of the content would fall outside the scope of this study.

In Ghana, the processes of logging in both reserves and off-reserves are quite different. Each is briefly discussed. In forest reserves, each TUC area has an approved operational or management plan with a harvesting schedule detailing the sequence of timber harvesting for the area under a 40-year felling cycle. Timber harvesting in reserves takes place within a compartment; a basic unit of forest reserve with an average size of 128 ha where all management prescriptions take place. The main requirements for logging in a compartment are the enumeration of all economic timber species with stem diameter of 50 cm dbh and above, preparation of pictorial maps showing the location of all trees and other topographic features and the selection of yield (Anon, 1995). For purposes of sustainable forest management (SFM), the optimal volume of timber that could be removed annually by all logging firms in Ghana from all the forest reserves should not exceed the national indicative felling limit (NIFL) which is fixed at 0.545 million m^3 (Affum-Baffoe, 2002). This figure was derived from the results of 2001-2002 multi-resource forest inventory in the high forest zone as the sustainable level of timber harvest that the forest reserves can tolerate (ibid).

The harvesting of approved trees is the responsibility of the logging firm and is monitored and controlled by two-stage documentation: Tree Information Form (TIF) and Log Information Form (LIF). Each tree felled is measured and recorded on TIF, prior to cross-cutting, by an officer of the FC within two days (TRMR 1998). The TIF provides the basis for the computation of the actual volume of each tree felled and the stumpage fees payable on it. Stumpage fee represents royalties to the landowner (in most cases a traditional authority) and charges for the cost of timber harvested. The aggregate of the TIF data for all logging firms in Ghana for a particular year gives the official quantity and volume of trees legally felled for that year. Each log produced from a tree is measured and recorded on LIF by the logging firm. The LIF provides the basis for issuance of a Log Measurement and Conveyance Certificate (LMCC) which controls the movement or transportation of logs from a forest area to a processing facility. The LMCC contains information on the exact volume of logs taken from the forest and serves as a proof of the legal origin of the logs or timber products in transit within Ghana (Anon 1995, TRMR 1998).

Timber harvesting in off-reserve areas is also subject to TUC, salvage permits as well as TIF, LIF and LMCC. However, it is not rigidly controlled as in forest reserves due mainly to the existence of other land use options including large scale farming, mining and urban settlements that are incompatible with sustainable forest management. There are no management plans for TUC or salvage permit areas in off-reserves but only operational or approved harvesting regimes. However, in 1994-1995, the Forestry Commission conducted a nationwide off-reserve timber inventory and allocated quotas to each forest district as part of the measures to introduce some level of control in the exploitation of timber resources there. The quotas at the time, represented the optimal (maximum) volume of timber that could be removed per year and the figure was put at 500,000 m^3 (Anon, 1995). Nonetheless, this figure was not adhered to by the Forestry Commission when it was realized that farming and other developmental activities in the off-reserve areas were destroying more trees than anticipated. The quota has since been increased to 1.5 million m^3 (Anon, 2005). Other measures introduced to regulate the off-reserve timber harvesting include pre-felling inspections of all economic species with tree stems of 50 cm dbh and above, preparation of stock and yield summaries indicating all trees enumerated during the pre-felling inspection and those actually selected for harvesting respectively. The Regional Forest Manager (RFM) who is a state official approves the number of trees to be harvested (yield) for the logging firm to commence for harvesting operations.

2.2.3 Nature and quantitative information on extent of illegal logging in Ghana

This section presents an overview of the actors, nature and various studies on the extent of illegal logging in Ghana. Different actors are involved in illegal timber harvesting in Ghana. The main actors are the registered logging firms and unregistered chainsaw operators who use powered chainsaw machines to harvest timber and convert them in-situ into lumber (Odoom, 2004). There are also canoe carvers who harvest mainly *Triplochiton scleroxylon* (Wawa) species and carved them into canoes for fishing. However, studies have suggested that the chainsaw operators and the registered logging firms are the main perpetrators of illegal timber harvesting in Ghana (Birikorang *et al.,* 2001; Hansen and Treue, 2008; Marfo, 2010).

In the Ghanaian context, like elsewhere, illegal logging among the registered logging firms takes diverse forms including harvesting timber in excess of the approved yield, harvesting in areas beyond the limits of approved TUC or salvage permit and harvesting with expired documentation. The illegal chainsaw operators, mostly operate at night and non-working hours in virtually every forest area they could find. Most of them are armed and ready to attack any person including forestry officials who dare to confront them or use informants stationed at vantage points to alert them of any approaching danger.

Perhaps the maiden work on quantitative estimation of the extent of illegal timber harvesting in Ghana was that of Birikorang *et al.* (2001). They used field survey data with 1999 as the snapshot to arrive at a total log harvest of 3.7 million m^3 including 1.0 million m^3 legal harvest. Of the remaining 2.7 million m^3 illegal harvest, 1.7 million m^3 was attributed to the informal sector (chainsaw operators). The remaining 1.0 million m^3 was attached to the formal sector (registered logging firms). The main difficulty with their work is that the methodology employed is not well explained except to mention that it was based on 1999 field survey of logging firms in Ghana.

Hansen and Treue (2008) relied on timber harvest and export statistics from 1996 to 2005 to estimate the level of illegal harvesting at between 2.3 and 2.7 million m^3 annually. According to that study, the informal sector that supplies lumber to the domestic market accounts for two-thirds whereas the export-oriented formal sector was responsible for the other one-third. Although their methodology is well explained, their work solely relied on the 1999 recovery rates (i.e., volume of a particular timber product as a percentage of the log volume needed to manufacture it) and the distribution of the end products to domestic and export markets used by Birikorang *et al.* (2001). With passage of time these figures have changed and therein lies the justification for a new study that takes into account the current recovery rates and consumption patterns.

Other studies have concentrated on illegal timber harvesting by the informal sector. For instance, Marfo (2010), based on the estimated number of chainsaw operators and their annual production figures assessed illegal harvesting for the informal sector to be 2.5 million m^3. According to that study, 84% of lumber consumed locally in Ghana is illegally produced. Lastly, Hansen et al (2012) adopted the around-the-clock market monitoring of wood-transporting vehicles at 19 selected timber market centres to estimate the annual illegal timber harvest by the informal sector (chainsaw operators) at 1.4 million m^3.

2.3 Methodology

The study investigates illegal logging and its associated trade in Ghana at the national level, covering all registered logging firms, spanning over a 12-year period starting 2000 to 2011. Such a long timeframe allows investigation of trends and provides analytical robustness by levelling out stock fluctuations at mills as well as possible delays in updating official harvesting and export records (Hansen and Treue, 2008). The national level study as against a case study on such a sensitive subject is to prevent the possible blacklisting of any particular logging firm on the international market. The informal sector (including chainsaw operators, charcoal producers and fuel wood gatherers) is excluded and so are plantation grown timber species such as *Tectona grandis*. This means that only natural timber from the tropi-

cal high forest zone produced by the formal sector (registered logging firms) is considered in the study.

2.3.1 Data sources

Data for the study was obtained principally from secondary sources. For official information on illegally harvested timber, the study uses official statistics on the volumes of illegally harvested timber by all registered logging firms that have been detected and reported by the officials of FSD (state regulator). These statistics are contained in Forest Services Division annual performance reports available at its headquarters in both manual and electronic formats. Data on the total volume of trees officially (legally) harvested annually by all logging firms was obtained in electronic format from the Tree Information Form (TIF) database stored at Resource Management Support Centre (RMSC), the technical unit of FC. From the Log Measurement and Conveyance Certificates (LMCC), the Timber Industry Development Division (TIDD) of the Forestry Commission compiles and stores annual electronic data on the legal volume of logs transported by all operating logging firms from the forest to the saw-mills for processing.

Again, TIDD has an electronic database on timber products exports from Ghana. These timber products are manufactured from the logs and includes boules, lumber, plywood, veneer, flooring and furniture parts. Data on recovery rates or conversion efficiency (i.e., volume of a particular timber product as a percentage of the log volume needed to manufacture it) and distribution of products to export and domestic markets were, with modifications from the studies of Gyimah and Adu (2009), Marfo (2010) and TIDD (2010) respectively, adopted from Birikorang *et al* (2001). Details are captured in table 1. For now, Ghana does not export or import logs, they are therefore not factored in the assessment. The reliability of these data sources, the merits and demerit are analysed in the first part of the discussion section in this study.

Table 2.1 Average recovery rates and distribution of products to export and domestic markets

Wood product	Recovery rate	Distribution of products	
		Domestic market (%)	Export market (%)
Lumber[1]	35	16	84
Rotary veneer[2]	30	50	50
Sliced veneer	40	50	50
Boules[3]	80	0	100

1 Lumber product distribution figures for the domestic and export markets are reliable estimates and not based on inventory or survey as none exist at the moment.
2 Modified from TIDD (2010)
3 Modified from Gyimah and Adu (2009)

2.3.2 Measurement of the extent of illegal logging

In this study, two approaches are used in the measurement of the extent of illegal timber harvested. With the first approach, the extent of illegal logging (EIL) is assessed as the percentage of illegal logs in the total legal tree/log production. This is expressed mathematically as,

EIL = (Reported illegal harvest/recorded legal harvest) × 100 ------- (1)

In this measurement, only the formal data sources on volume of legal and illegal logging for each particular year is used.

The second measurement is based on a comparison of the "actual timber production/harvested" and the legal (official recorded) harvest. The "actual harvest" is estimated indirectly as the round wood equivalent (RWE) of the various timber products manufactured by all saw millers. Here the total volumes of the various timber products manufactured annually by all saw millers are used to estimate the "actual volume of timber harvested".

Mathematically, the extent of illegal logging using this indirect approach proposed by Tacconi (2007) and adopted by Hansen and Treue (2008) is estimated as;

EIL = Total Actual Harvest (TAH) – Total Legal Harvest (TLH) ------- (2)

Where TAH= the estimated actual harvest or the RWE of the various timber products manufactured. The main products considered are boules, lumber, veneer/plywood and tertiary products. In this study, it is assumed that rotary veneer and plywood production are integrated. Similarly, lumber and tertiary products (flooring, furniture parts, mouldings and etc.) are also assumed integrated. What this means is that logs in-take for tertiary products are embedded in that of lumber, whilst that of plywood is embedded in rotary veneer.

TLH = Total Legal timber harvested (TIF) or legal log production (LMCC)

2.4 Results of the study

2.4.1 Estimated illegal logging

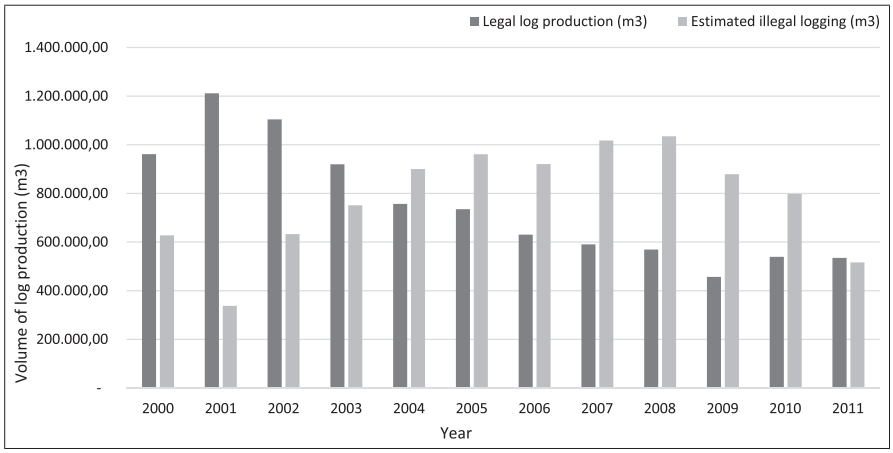

Figure 2.2 Comparison of legal and estimated illegal log production (2000-2011)

The results estimated a total annual average log production of 1.53 million m^3, including an annual average legal log production of 0.75 million m^3 (Fig.2.2). The remaining 0.78 million m^3 representing 104% of the legal log production is unaccounted for and could be deemed illegal logging.

2.4.2 Sources of timber harvested

The data indicates the dominance of the forest reserves as the major supplier of timber. Of the total 11.7 million m^3 of timber harvested within the period of the study, 7.2 million m^3 (62%) came from forest reserves. The remaining volume of 4.5 million m^3 (38%) was sourced from farm lands and fallow areas in the off-reserves.

Analysis of the data shows that whilst the national estimated annual average illegal log production stood at 0.78 million m^3 or 104% of legal log production, this figure was not the same for the annual average of all the 83 species harvested. Significant levels of variations existed among the individual species illegally harvested with some exceeding their legal limits by 740%. Figure 2.3 depicts the top eight species that were exploited in excess of 104%. The annual average illegal logging rate for the eight most affected species was 340%.

2.4.3 Illegal logging among species

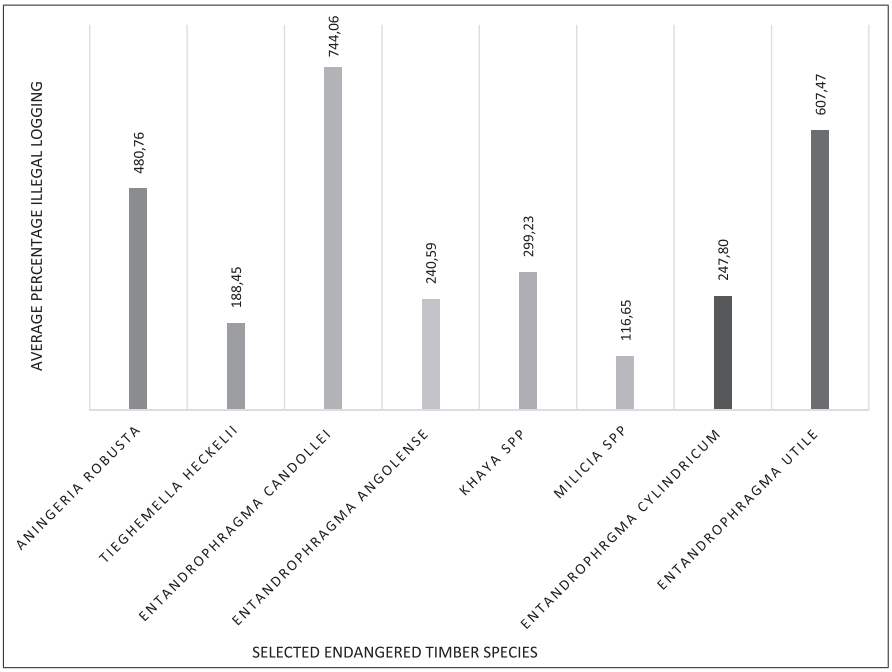

Figure 2.3 Level of illegal logging among selected endangered timber species (2000-2011)

2.5 Discussion

2.5.1 Methodological challenges

This part outlines the main challenges associated with the various data sources and each of the methodologies used in the study. The direct approach relied on the reported (official) volumes of illegal logging captured in FSD annual reports. The main challenges, as pertain to all criminal activities, included; non-detection of some illegal logging operations, non-reporting and under-reporting in terms of the frequency and actual volumes of illegal logging (MCPFE, 2007). The reasons for non-reporting and under-reporting could be the embarrassment that high reported illegal logging statistics cause to the enforcement officers. The second is the potential adverse impact it could have on the trade of timber from such countries on the international market (ibid). In Ghana for instance, Boakye (2003) observed that, sanctions (both real and perceived) from superior officers, poor end-of-year performance appraisal ratings and in some cases the involvement of forestry officials in illegal operations were among the reasons why some detected forest offences go unreported.

The indirect measurement also contends with the same challenges enumerated above in addition to the following; first, underestimation and overestimation of tree and log volumes. These may be intentional depending on whether the Forestry Official wants to help or punish a particular logging firm. It can also be unintentional emanating from errors in tree/log measurement to volume computations. Second, non-transmission of TIF and LMCC data from the various forest district offices to the collation centres at RMSC and TIDD offices respectively for varied reasons including sheer negligence. Third, non-capturing of TIF and LMCC data into the central database due to oversight and sheer negligence. Fourth, movement of logs without LMCC-the major reason being the delays in transporting logs to LMCC issuing points and sometimes shortages of LMCC booklets and absence of issuing officers from duty. Fifth, variations in recovery rates for same export product depending on such factors as contract/product specification, log quality, wood defects, type of machinery and expertise of machine operators. Sixth, lack of credible data on local wood consumption. Seventh, sale of confiscated logs and chainsaw lumber to registered logging firms that eventually find their ways into the export trade and finally under-reporting of export figures for tax evasion purposes.

Notwithstanding, the challenges enumerated for each of the approaches, the indirect approach should be preferred in the determination of the extent of illegal logging in the formal sector in Ghana. The reasons for this conclusion are discussed below.

2.5.2 Illegal logging trends in Ghana

2.5.2.1 Quantitative analysis of volumes illegally harvested

From the data analysis, the annual average estimated log production by the logging firms (formal sector) was 1.53 million m^3 including a legal harvest of approximately 0.75 million m^3. The remaining 0.78 million m^3 could not be accounted for and may be deemed illegal harvest. This means that 104% of the log production was of doubtful origin. The results suggest an increase in the level of illegal logging from 0.34 million m^3 (28%) in 2001 to over 1.00 million m^3 (182%) in 2008 (Fig. 2). Ironically, whilst the annual legal log production dropped in absolute terms from 1.25 million m^3 in 2001 to 0.54 million m^3 in 2010, the level of illegal logging moved from 0.34 million m^3 to about 0.80 million m^3 over the same period.

Again, whereas the average illegal logging for the study period is 104%, a detailed examination of the figures showed that the average for the period 2004 to 2011 alone was about 150%. This suggests that illegal logging by the formal sector is on the ascendency. Generally, this result supports earlier studies by (Birikorang *et al*., 2001; Hansen and Treue, 2008). Birikorang *et al*. (2001), for instance estimated illegal logging in 1999 at 1.00 million m^3 (100% of legal harvest). Similarly, Hansen and Treue (2008) estimated the

annual average illegal logging from 1996 to 2005 for the formal sector at between 0.8 and 0.9 million m^3 (or 70% of legal harvest).

2.5.2.2 Variations in species illegally harvested

The results revealed vast variations in levels of illegal logging among the various timber species harvested. Whereas the national average illegal logging for all species was 104%, some eight (8) species recorded an average of 343% above their legal limits (Fig.3). The ecologically threatened but economically valuable timber species including the *Entandrophragma and Khaya species* were the most affected. They were followed by *Aningeria robusta (Asanfena), Milicia excelsa (Odum) and Tieghemella heckelii (Bako)*. For instance, *Entandrophragma candollei* recorded an average illegal harvest of 744%, followed by *Entandrophragma utile* (607%), then *Aningeria robusta* (480%) and *Milicia excelsa* (117%). This observation confirms previous studies by Adam *et al.* (2006), Alder (1989), Ghartey (1989), and Hansen and Treue (2008) that illegal harvest was most predominant on the so-called prime species. The reasons for this observation are not far-fetched. These traditional endangered species are used for variety of purposes including constructional work, furniture, veneer and interior decoration and are therefore in high demand, easy to market and attract good prices in both the domestic and export markets.

The resultant effect of such practice is the creaming of the production forests which, according to Longman and Jenik (1987), is the preferential extraction of few timber species in the midst of several hundreds of potential timber species, or the removal of only the individuals within a species that are well-formed and the fastest growing. The eventual results are the loss of the forest value and degradation. To check this unhealthy practice, FSD should make available to TIDD all approved yield to serve as a check on the volumes of each timber species that can be legally traded. It is here that the proposed electronic wood tracking system under the VPA will be most helpful if properly implemented. It is also important for the government to institute measures that will promote the utilization of more timber species than the current number.

2.5.2.3 Sources of timber supply

The timber industry in Ghana depends principally on the natural forests in both reserved and off-reserve areas for supply of timber. From a historical perspective, log production from these sources has varied over the years depending on regulatory framework in place for forest management. The first formal forest policy adopted in 1948 provided for the maximum protection of the forest reserves areas and gradual decimation of the off-reserve timber resource to pave way for farming (cocoa and food crop production). Consequently, for the 1950s and 1960s most of the timber supply came from the off-reserves. Anon (1970) reported that for the period 1960-1970, the

average off-reserve timber production was 67% whilst the forest reserves' production stood at 33%. The proportions changed in the 1970s and 1980s following a forest management decision to remove all commercial trees in forest reserves with dbh 110 cm and above (the so-called over-mature trees) on a 15-year salvage period (Anin-Bonsu, 1970). From 1971 to 1980, the average log production from reserves forests rose to 61% whereas the off-reserves share was down at 39% (Anon 1980). This trend continued for the period 1981-1990, with the average log production from the reserves moving up to 64% whilst the portion of the off-reserves further dipped to 36% (Anon 1990).

With the completion of the removal of the over-mature trees and introduction of new stringent harvesting control measures for forest reserves in 1991, the proportions of timber production from the two main sources changed again between 1990 and 1999 with the off-reserves having 71% as against 29% for forest reserves (Birikorang *et al*. 2001). According to Adam et al (2006), the high demand for round log export for *Ceiba pentandra*, *Antiaris chlorophora* and other lesser known species which occur in large quantities in the off-reserve areas where harvesting rules and controls are less stringent increased logging activities in this area especially up to 1995 before the log export ban.

From the analysis of tree and log production data for the period 2000-2011, the proportions of forest reserves and off-reserve shifted again to 62% and 38% respectively. In absolute terms, the off-reserve log production declined from 0.64 million m^3 in 2002 to 0.29 million m^3 in 2011. This observation is in sharp contrast with what pertained in the 1990s, a clear indication that the off-reserve lands have been creamed of its timber resources due to inadequate control and lack of effective measures to restore what is harvested. The situation in the forest reserves is no better. It appears on the surface that the on-reserve production figures are increasing but the results of this study show they have decreased from over 0.72 million m^3 to 0.47 million m^3 over the same period. For the period 2006-2011, the on-reserve log production actually dropped by ten percentage points from 71% to 61%. What this means in practice is that the proportion of the on-reserve production is increasing at a decreasing rate.

Official reports on illegal logging from FSD annual reports (2000-2011) and TIDD export statistics on timber products did not segregate illegal harvest by origin. It is therefore difficult to indicate the exact quantities of illegal logs derived from each source. However, based on the National Indicative Felling Level (NIFL) of 0.545 million m^3 for all timber species and the near depletion of timber resources in the off-reserve, it is inferred that most of the illegal logging takes place in forest reserves. This situation has negatively affected the timber producing potential of the tropical high forest of Ghana (both reserved and off-reserve areas) and calls for serious interventions to reverse the trend. First, there is the urgent need to step up plantation forestry in both reserved and off-reserve areas to increase timber stock; and second, the adoption of effective enforcement measures

to safeguard the remnant natural forest from illegal and unsustainable exploitation.

2.5.3 Implications for forest laws compliance and enforcement

The results suggest that a high level of illegal logging exists even among the formal industry actors in Ghana. This situation indicates a low level of law-abidingness (compliance) of logging rules among the operating logging firms in Ghana. Apart from the logging firms in the formal sector, similar studies on the chainsaw operators in the informal sector portrayed low levels of compliance (Hansen and Treue, 2008; Marfo, 2010). It is possible to find wood vendors in the informal sector trading in illegal chainsaw lumber in the open market contrary to Regulation 32 of the Timber Resources Management Regulation, 1998 (LI 1649). This portrays an impression that illegal timber harvesting is a crime only within the forest gates/corridors and that once the logs or chainsaw lumber arrived at a market centre, they become "legal" to freely buy or sell.

Illegal logging among the logging industry poses a serious challenge to Ghana in achieving the shared global objectives on forests, a framework towards sustainable forest management. It is therefore incumbent on the State to use its coercive (policing, prosecuting and sanctioning) powers and promote acts that enable and encourage positive behaviour to elicit compliance among the logging firms. Again, a thoroughly socio-legal research on why and how logging firms violate the regulations that prohibit felling outside approved yield could also be useful in finding a cure to the problem.

The level of illegal logging observed in the study equally has serious implications for our assessment of forest law enforcement in Ghana. If the level of illegal logging revealed is a 'kind of barometer' to gauge the effectiveness of strategies being implemented by the law enforcement institutions to control illegal logging, then it may be reasonable to conclude that the existing enforcement strategies have not worked to satisfaction. This should be a wake-up call for the FC which is the main public sector institution charged with the responsibility for the protection, management, development and regulation of utilization of forest resources in Ghana, to critically monitor its own performance.

This may mean a lot of things to FC including reducing the opportunity and benefits for illegal logging. This should be done through; increase rate of detection of illegal logging by employing modern technologies (such as cameras and drones) in patrols and reconnaissance surveys, increase the benefits from the forest to the forest fringed communities and forest land owners to elicit their support in protection. It would also mean impressing upon the legislature to pass deterrent laws and the judiciary to impose heavy fines and sentences. Lastly, it could also mean, improving the general working conditions and logistical support to the front-line FC staff, naming and shaming culprits of illegal logging and end of chain consumer product brands using legally harvested timber and educating the citizenry in both

producer and consumer countries to purchase only legal wood products. Some of the measures put forward here may not be entirely new to FC but lack of resources and possible inertia on the part of the government may have prevented their full implementation.

2.5.4 Implications for Ghana-EU VPA and sustainable forest management (SFM)

Ghana will soon issue its first FLEGT license under the VPA with EU to signify its commitment to timber legality and sustainable forest management. However, the high illegal logging, the continued existence of the conditions-precedent for illegal logging in Ghana including; high demand for timber products, high levels of poverty, unemployment and corrupt practices (Appiah *et al*., 2007; Blay *et al*., 2007; Marfo, 2010), and emergence of other markets outside the EU with no regard for timber legality, all pose grave threats to the success of the VPA. Presently, there is a huge deficit between demand and supply of wood products (especially lumber) in the domestic market. This deficit is currently being met with illegal lumber from chainsaw operators who are supplying about 84% of the domestic lumber requirement (Marfo, 2010). It is important to understand that the illegal logging and milling businesses in Ghana have thrived over the years because the products supplied by them continue to be in great demand both locally and internationally. This supports a general principle enunciated by Passas (2002) that, illegal or criminal activities persist as long as the goods and services provided or produced by them are in great demand by the populace.

Another major challenge to the VPA is the existence and emergence of other markets outside the EU where timber legality is not a topmost priority. These markets in the West-African and Asia/Far East have already crippled the EU's share of timber products from Ghana. For instance, wood exports to the EU dipped from 257,000 m^3 (57% of total exports) in 2000 to 64,000 m^3 (20% of total exports) in 2011 whilst the share of the West-African sub-region within the same period increased from 35,000 m^3 (11.6% of total exports) to 163,000 m^3 (51% of total exports) (TIDD 2000, 2011). The share of Asia/Far East market also rose from 52,000 m^3 (12.3%) in 2000 to 82,000 m^3 in 2010 (20% of total exports) (TIDD, 2010). It can therefore be posited that the closure of the EU market (and by extension the markets of all the developed economies) alone to illegal timber products from Ghana when other markets within the African and Asian regions are wide opened will not immediately curtail illegal logging in Ghana. Again, the other conditions for illegal logging and associated trade such as poverty, unemployment and corruption still persist. The author can therefore hypothesize that the mere roll out of the VPA with the issuance of FLEGT license will not automatically freeze illegal logging or trade in illegal wood products from Ghana.

Should we then, on the basis of this evidence, conclude that the VPA is dead on arrival and of no relevance to Ghana in terms of meeting its stated objectives? Not at all! It only means that the parties will have to practically demonstrate absolute good faith in meeting their obligations under the VPA. They will have to work hard to address all the challenges identified that can militate against the implementation of the VPA. On its part, the Government of Ghana (GoG) will have to adopt a number of policy interventions including; supplying the domestic market with sufficient legal timber products. This could be done through directing certain timber species (including *Piptadeniastrum africanum*, *Pterygota macrocarpa*, *Terminalia superba* and *Morus mesozygia*) solely to the booming domestic construction industry, instituting a quota system for the export and domestic markets, developing and promoting other wood substitutes such as bamboo, rattans and plastics. Again, the GoG must use all its powers (both coercive and persuasive) to enforce all its logging regulations, work seriously at improving the economy in terms of job creation, poverty reduction and removing all the other underlying causes of illegal logging. The EU consumers on their part should be prepared to pay high premiums on timber products that meet the legality standards. This can help change the direction of timber trade in favour of EU countries. Again, the EU and other developed economies should use their persuasive powers to influence all other States to make timber legality a topmost priority. For allowing trade in illegal timber products in any market will be a serious threat to trade in legal timber globally.

2.6 Conclusion

This study has confirmed Hansen and Treue (2008) in that the indirect approach of using export statistics and log production figures gives better estimates of illegal logging than official records which were found to grossly understate the problem. It equally highlighted the widespread illegal logging in Ghana especially in the production forest reserves and among the prime timber species. The study uncovered the low level of forest law compliance among the operating logging firms in Ghana and the failure of the existing enforcement measures to halt illegal logging. Hence, the national roll out of the VPA in Ghana will be neither easy nor smooth and that the Parties to the agreement must demonstrate greater commitment beyond signature and rhetoric to cause the VPA to succeed.

3 Motivations for (non) compliance with logging regulations: The case of licensed logging firms in Ghana

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3.1 Introduction

Illegal logging and associated trade in illicit timber products are major problems for both the developed and developing timber producing countries. Worldwide, it is estimated that about 30% of all timber harvested annually comes from illegal sources (World Bank, 2012). The extent of the problem appears most pronounced in developing countries. Based on an extensive literature review, Smith (2004) reported that the volume of illegally harvested timber ranges from at least 20% in Russia through 70% in Indonesia to even 90% in Cambodia.

The adverse impacts of illegal logging are diverse: Economically, it is estimated that 10-15 billion USD of public revenue is lost annually due to illegal logging and associated illicit trade in timber products worldwide through funds that are unregulated, untaxed, and often remain in the hands of organised criminal gangs (World Bank, 2012). This amount is more than eight times the annual development assistance from the developed world to the developing countries (FAO, 2015). The social impacts are enormous. It undermines the rule of law, may stimulate corruption, and can contribute to conflicts as it mostly occurs without the consent of the forest-fringed communities. It has been linked to weapon purchases in some conflict zones such as Cambodia, Liberia and the Democratic Republic of the Congo (UNEP, 2011). Finally, the environmental effects include loss of habitats and/or biodiversity, climate change and destruction of areas of cultural significance/heritage as violators do not comply with environmental standards or best logging practices.

There has been growing awareness about the adverse consequence of illegal logging and associated ilicit trade in recent times world-wide. For instance, in 1998, the G8 countries developed an 'Action Program on Forest' to address forest policy and management problems including illegal logging (Eberhardt, 2013). This has been followed by the East Asian Forest Law Enforcement and Governance (EA FLEG), the African Forest Law Enforcement and Governance (AFLEG) and the EU Forest Law Enforcement Governance and Trade (FLEGT) Action Plan. The main thrust of all these

initiatives is how to intensify national efforts and strengthen bilateral, regional and multilateral collaboration to address forest violations **(**Eberhardt, 2013**)**

In Ghana, illegal logging is recognised as a major challenge. Some studies estimate that about 70% volume of the annual timber production is illegal (Birikorang et al., 2001; Hansen and Treue, 2008). The Government estimates the annual loss of public revenue due to illegal logging at between USD 8 and 13 million, equivalent to 2% of Ghana's gross domestic product (GoG, 2012). As part of the measures to tackle this menace, Ghana has adopted various policy and legal instruments including the 2009 Voluntary Partnership Agreement (VPA) with the EU under the EU VPA/FLEGT aimed at ensuring that only legal timber is produced and traded on both the domestic and international markets. Nonetheless, the problem persists, raising questions about the effectiveness of the measures being rolled out to address the problem. It is imperative to stress that timber harvesting in Ghana is extensively regulated and that the problem of illegal logging is not lack of regulations but basically a low level of compliance. The critical issue then is how to improve compliance among the licensed logging firms in Ghana.

Some previous studies on compliance in Ghana examined farmers' compliance with forest rules that regulate timber harvesting on farmlands, farming in forest reserves and use of fire on farmlands (Ramcilovic-Suominen and Hansen, 2012). The findings indicate high levels of compliance with farming and fire rules but low compliance for timber harvesting rule. Again, Hansen (2011) studied law compliance in the case of on-farm timber extraction with rules that require timber operators; to obtain prior and informed consent from the farmers, to pay appropriate and timely compensation for crop damage during timber extraction and chainsaw milling. The study documents low level of compliance in all the three domains.

However, much less is known about how logging firms in Ghana make decisions about whether to obey or break timber harvesting regulations. This paper investigates compliance-violation behaviour of logging firms in relation to legal rule or regulation that prohibits illegal logging. Though illegal logging has no universally accepted definition, it takes place when timber is sourced, allocated, harvested, transported, processed and traded in violation of national laws (Tacconi, 2007). It is empirically studied as timber harvested outside a firm's legally allocated concession area, number, volume and species of trees without written authorisation from a competent forest authority (FPA, 2002). In other words, the study only considers illegal logging at the production or forest level.

This case study has two objectives. First, to determine the motivational factors that influence compliance-violation behaviour among logging firms in Ghana and second, what variations in compliance exist among the various categories of firms? It is believed that understanding how logging firms in Ghana think and make decisions about compliance could prove useful in the design of effective regulations to improve compliance in Ghana and beyond.

3.2 Theorising compliance

This section introduces the theoretical framework and the underlying hypotheses used for this study. What shapes compliance-violation behaviour among individuals and regulated entities can be explained from different perspectives including economic, social and normative motivations.

3.2.1 Economic motivations

Standard economic theory holds that firms, as profit-seeking entities, will comply with regulations only when they believe that the compliance costs are exceeded by the cost of legal penalties for violation, discounted by the probability that violations will be promptly detected and punished (Becker, 1968; Thornton et al., 2009). The economic literature thus predominantly views compliance as a rational choice, motivated by financial considerations (Yapp and Fairmann, 2005). Various empirical studies, ranging from firms' compliance with industrial pollution (Kagan et al., 2011) to fishers' compliance with fisheries regulations (Raakjaer Nielsen and Matthiessen, 2003) have found evidence in support of deterrent effect of perceived detection risk and sanction severity from both state institutions and non-state actors on compliance behaviour.

Apart from deterrence (i.e., the perceived risks of detection and sanctions), the economic calculations also analyse the perceived operational costs and benefits of legal and illegal behaviour. According to Yan et al. (2015), whereas deterrence focuses on the eventual costs of violating the law, operational costs-benefits calculations look at the profitability or otherwise of legal and illegal operations as they occur within everyday business practices. Studying Chinese farmers' compliance with pesticide regulation, they found that regulated actors with perceived positive cost-benefit ratio for legal operations complied better than those with perceived negative cost-benefit ratio.

Flowing from this theory, two different but related hypotheses are put forward;

i. A higher expected sanction severity will lower violation rate and that the small-scale firms who often have a weaker financial capacity are more likely to comply better than the large and medium-scale firms.
ii. A higher perceived cost of compliance will increase violation rate and that the large and medium-scale firms who often have a stronger financial capacity are likely to better comply than the small-scale firms.

3.2.2 Social motivation

The desire of individuals and regulated firms to earn the approval and respect of significant others as a motivation for compliance is well documented in sociological studies (Cialdini, 2007; Elster, 1989). According to

Elster (1989), social norms are shared values of appropriate conduct within a specific group of people and which are at least sustained by the approval or disapproval of others. For instance, Sutinen and Guavin (1998) reported in their Massachusetts lobster fishery research that peer-pressure and informal sanctions accounted for most of the compliance observed.

The importance of maintaining good reputation has also been found to shape compliance behaviour of firms (Fisse and Braithwaite, 1983). In an interview with executives of large corporations, Ayres and Braithwaite (1992) reported that both individual executives and the corporation collectively valued good reputation or status in the community they operate as priceless assets. Against this backdrop, it is hypothesized that higher social pressure will increase compliance and that the large and medium-scale firms who are more likely to have higher visibility and reputation are likely to comply better than small-scale firms with limited visibility and reputation.

3.2.3 Normative motivations

For some actors, what influence their compliance behaviour is the internalised obligation to do the right thing without any tangible or material rewards or an explicit cost-benefit calculation (Young, 1979). Normative motivation (i.e., obligation to comply) is a combination of the regulated actors' moral/civic duty to obey a given regulation, perceived reasonableness of the regulation and legitimacy of the regulatory institution (Winter and May, 2001). Elster (1989) defines moral norms as [personal] norms concerning ethical values relating primarily to what is right or wrong that are largely independent of extrinsic influence. According to Vandenbergh (2003), regulatory rules that become or are internalised into actors' morals produce the deepest form of compliance because violating such rules means violating one's own morals.

Research has revealed that regulated actors generally comply with rules they deem reasonable even without direct material benefits (Young, 1979). In their studies of the Danish fisheries regulations, Raakjaer Nielsen and Mathiensen (2003) found that fishers were reluctant to comply with regulations they perceived as unreasonable. According to Tyler (1990), legitimacy is a feeling of obligation to obey law and defer to the decision made by legal authorities. Evidence suggests that most people obey regulations emanating from trusted institutions (Levi et al., 2008). Here, compliance depends on actors being satisfied with the law-making processes (including participation, openness and accountability), the content and the outcomes of the decisions made by the authorities, in terms of consistent interpretation and fair application of the law (Honneland, 1999).

For the normative theory, it is hypothesised that a higher sense of duty to comply will increase compliance rate and that the large and medium-scale firms who often have many professional staff in charge of their forest operations are more likely to comply better than the small-scale firms with no or limited professional staff.

3.3 Methods

The study investigates compliance and its influencing variables from the perspectives of regulated actors. This is important because it is the way they perceive these factors that eventually shape their compliance decision making processes (Gray and Silby, 2012).

3.3.1 Measuring compliance and its independent variables

Compliance or law-abidingness occurs when individuals act or refrain from acting in such a way that their behaviour is consistent with that required by law (Ostermann, 2016). In this study, compliance denotes the situation where individual logging firms harvest only the legal trees allocated to them or refrain from harvesting trees illegally. Compliance variables are what influence individual firms to comply with the stated legal rule.

Measuring compliance is complicated, and any approach used (either self-reporting, participatory observation or official data from regulatory agencies) has its own challenges. They include low levels of reliability due to the sensitivity of asking about illegal behaviour, low levels of representativeness and biases in recorded governmental data on violation behaviour respectively (Parker and Nielson, 2009; Yan et al., 2015).

In this study, compliance is measured in terms of violation outcomes (i.e., number of violations committed by each firm) as captured by the regulatory agency during field inspections at different times and self-reported data from the firms themselves. Prior to the interviews with the respondents, data were obtained on the number of violations recorded on each firm within the last two years by the respective district forest managers. This background information was used to verify the self-reported firm data. A benchmark of two years preceding the interviews was considered reasonable period within which respondents could recollect precisely the number of violations committed.

Interviews with the firms start from how they entered into the timber business, the challenges they currently face, and proceed through how and where they source raw materials to price levels. Normally, illegal logging pops up at this stage. This then leads to questions on whether they always harvest only the legal trees allocated to them and the number of times they have harvested more trees than allocated to them within the last two years. Any difference in the two figures was resolved in favour of the higher one. Only responses that help to measure the number of violations committed were coded. The codes were very good for firms' who recorded between zero and two violations, good for those who recorded 3 and 4 violations and poor for those who recorded 5 upwards.

3.3.2 Measuring compliance variables

The main variables considered are economic, social and normative motivations. Appendix A contains the questions used to measure compliance, its independent variables and a description of the relevant coding.

3.3.3 Sampling of logging firms and data collection

To investigate the firms' compliance performance with the rule under study, a total of 12 logging firms were selected. For this study logging firms are categorised into large, medium and small-scale using the Year 2010 timber production statistics published by the Timber Industry Development Division (TIDD) and the number of people directly employed. The large-scale firms produced at least 10,000 m^3 of sawn timber products and employ a minimum of 1000 people. The medium scale firms produced between 5000 m^3 and 10000 m^3 of sawmill derived timber products and employ between 100 and 1000 people per firm. The small-scale firms produced less than 5000 m^3 of round logs or sawn timber products and employ below 100 people (TIDD, 2010).

They consist of two large, six medium and four small-scale firms who operate both in productive forest reserve and outside forest reserves (i.e., farm and fallow lands). The selection of the firms was purely accidental as it depended on those firms that were willing and capable to discuss this somewhat sensitive subject matter with the researcher-a known regulatory official. For each selected firm, the Managing Director (who is the directing mind of the firm and is responsible for its day-to-day management), the Forest Manager(s) (who coordinate all timber harvesting operations and also serve as technical intermediary between management and field team) and the Bush Manager(s) (who directly supervise field harvesting operations) were interviewed. A total of thirty-eight persons made up of 12 Managing Directors, 12 Forest Managers and 14 Bush Managers were interviewed (Table 3.1).

Table 3.1 Overview of respondents

	Status of respondents			
Firm category	Managing Directors	Forest Managers	Bush Managers	Total
Large scale	2	5	3	10
Medium scale	6	7	7	20
Small scale	4	–	4	8
Total (N=38)	12	12	14	38

Although the relatively small sample size may weaken the external validity and generalization of certain findings, it allowed enough time to extract from the respondents comprehensive accounts of choices they have to make in response to challenges posed by the rule under study. These accounts

were generally more revealing of their (firm's) compliance-violation motivations, which is the primary object of this research.

Data was collected through a semi-structured interview technique that uses pre-determined interview guide containing a set of open-ended questions derived from the framework used. The researcher's knowledge and understanding of the industry helped in couching very specific main, and follow-up questions that drew upon responses by other firms. All the interviews were conducted face-to-face and lasted for about 90 minutes. Prefixes F1 to F12 are used for responses from firm one to twelve respectively.

This study analyses compliance performance at the firm level and not at the individual employee level. Second, the analysis considers only the direct effect of each of the main compliance variables and not their interactions on the compliance performance of the firms. Compliance analysis at the individual employee level and at the interactions of the main variables will be the subject matter of separate studies in future. For each important aspect of the study, the most illustrative quotes are stated. However, such quotations are not necessarily the position of all the participating firms.

3.3.4 Minimising biases and untruthful responses

Undoubtedly, each of the main data sources used has its own biases and limitations. The main challenges with official enforcement data, as in most criminal activities, includes non-detection of some illegal logging operations (due possibly to resource constraints for regular inspections), non-reporting and under-reporting in terms of the frequency and actual volumes harvested. The reasons for these include the embarrassment that high reported illegal logging statistics cause to the enforcement officials and the potential adverse impact it could have on timber trade on the international market. Self-reported data may also suffer from low levels of reliability due to the fear of self-incrimination, shared secret information being leaked to competitors or regulators and, the desire of individuals/corporate entities to maintain good reputation or status in the sight of the public.

With these limitations and biases in view, the study employed the following measures to help minimise them. First, at the outset of each interview, the researcher assured the respondent that the purpose of the study was basically academic and that information shared would be treated with confidentiality and not be used against them in anyway. The interviews were therefore not electronically recorded. However, notes were taken either during the interviews or immediately afterwards depending on the sensitivity of the respondent.

Second, the questions asked were very factual and bordered directly on the daily challenges they encounter in their operations. Third, the use of face-to-face semi-structured interview approach allowed for further invaluable analyses of their demenour aside from their responses. Fourth, for many of the respondents it was also an opportunity to put their concerns across to the regulatory agency for some action to be taken. Last, the timber

sector is not entirely unfamiliar to the researcher who has over twenty-five years of working experience as a regulatory official. These measures might possibly explain how respondents freely and openly shared their personal experiences about illegal logging, what influences it and how they thought the problem could be resolved. For example, in two separate instances, respondents reported violation figures that were two more than those officially recorded.

3.4 Results

This section presents the findings of the study. It shows the compliance performance of the firms, how the main compliance variables relate to firms' compliance performance and compliance variation among the different categories of firms (Table 3.2).

Table 3.2 Relationship between the compliance variables (economic, social and normative motivations) and logging firms' compliance performance

				Economic motivations			Social motivations			Normative motivations		
Nick Names of firms	Scale of operation	Compliance performance	Major market outlet[1]	Perceived cost of legal operations	Sanction severity perception		Impact of information of illegal logging on firms	Social sanctions for illegal logging	Impact of societal demands on firms	Moral or civic duty to comply	Perceived reasonable-ness of the law	Perceived legitimacy of the regulators
					State	Non-state actors						
Kwasi	Large	Good	EU	Positive	Low	High	Positive	Negative	Positive	Conditional	Negative	Negative
Kwadwo	Large	Poor	Asia	Negative	Low	Low	Positive	Negative	Positive	Negative	Negative	Positive
Kwabena	Medium	Very Good	EU	positive	Low	High	Negative	Negative	Negative	conditional	Negative	Positive
Kwaku	Medium	Good	EU	Negative	Low	High	Positive	Negative	Positive	Conditional	Negative	Negative
Yaw	Medium	Good	EU	Negative	Low	High	Positive	Negative	Positive	Conditional	Negative	Positive
Kofi	Medium	Poor	Asia	Negative	Low	low	Positive	Negative	Positive	Conditional	Negative	Negative
Kwame	Medium	Poor	ECOWAS	Negative	Low	Low	Positive	Negative	Positive	Conditional	Negative	Negative
Akosua	Medium	Poor	ECOWAS	Negative	Low	Low	Positive	Negative	Positive	Negative	Negative	Negative
Adwoa	Small	Very Good	EU	Negative	Low	High	Negative	Negative	Negative	Positive	positive	Negative
Abena	Small	Good	EU	Negative	Low	High	Positive	Negative	Negative	Conditional	Negative	Negative
Akua	Small	Good	Domestic	Negative	High	Low	Positive	Negative	Positive	Conditional	Negative	Positive
Yaa	Small	Good	Domestic	Negative	High	Low	Positive	Negative	positive	Conditional	Negative	Negative

1 ECOWAS stands for the Economic Community of West African States. Domestic means in-country.

3.4.1 Economic motivations and firms' compliance performance

The key findings for each of the two main components of the economic logic are presented under their respective sub-sections.

3.4.1.1 Deterrence and compliance performance

The results (Table 3.2) show that most of the firms particularly the large and medium-scale report of a lower perception of deterrence from the state. However, all the firms across the three different categories who export into the EU market have a higher perception of deterrence than those who export into other markets. Another finding is that all firms who reported a high level of perceived deterrence from either the state or non-state actors also recorded a very good or good compliance performance. Similarly, all firms who reported a low level of deterrence from both the state and non-state actors equally scored a poor compliance performance. Consequently, the study finds a strong relationship between deterrence and firms' compliance performance.

Across the different categories of firms, the study finds variation in their perception about deterrence and compliance performance with the small-scale firms having a higher deterrence perception than the large and medium-scale firms. These findings confirm the initial hypothesis that higher expected sanction severity will lower violation rate and that the small-scale firms who are more likely to have a weaker financial capacity are likely to better comply than the large and medium-scale firms.

3.4.1.2 Operational cost-benefits ratio and firms' compliance performance

The study finds that firms who reported a positive cost-benefit perception of legal operations also recorded either very good or good compliance performance. On the contrary, not all the firms who reported a negative cost-benefit perception of legal operations recorded a poor compliance performance (Table 3.2). This is unlike deterrence where all firms who reported low deterrence equally recorded a poor compliance performance and vice versa. The study thus finds that deterrence better explains firms' compliance performance than perceived cost-benefit ratio of legal operations.

Among the different categories of firms, Table 3.2 shows that, in descending order, the small, medium and large-scale firms reported the highest perceived negative cost-benefit ratio of legal operations. However, in terms of compliance performance, the small-scale firms scored higher than both the large and medium-scale firms. These findings sustain the first part of the initial hypothesis that a higher cost of compliance is likely to lead to more noncompliance but negate the second part that small-scale firms comply less than their counterparts.

Overall, the findings show a strong relation between firms' compliance performance and their economic variables with deterrence being a stronger driver than the operational cost-benefit ratio.

3.4.2 Social motivations

The study reports that for majority of firms' information about illegal logging (from either fellow loggers or chainsaw operators) adversely impact on their compliance performance. In other words, the behaviour of significant others matters for the compliance performance of participating firms. This finding suggests a fairly strong relationship between a firms' compliance performance and their perception about the behaviour of others. The results reveal no sharp variation among the different categories of firms in their compliance performance and the behaviour of others.

About social sanctions, firms report that there is no pressure on them from either the local community members or the timber trade association to comply. It is evident from Table 3.2 that no logging firm has ever been sanctioned by the local community and/or fellow loggers. The study makes two findings about local community's demands for infrastructural development and the firms' compliance performance. First, firms who reported such demands have no impact on them had a corresponding compliance performance of either very good or good. Second, firms who indicated a positive impact have mixed compliance performance record (table 3.2). The results suggest a fairly strong relationship between societal demands and firms' compliance performance. Across the firms, the findings indicate a decline in the impact of community demands on the firms' behaviour from the large through the medium to the small-scale.

In totality, the findings about social norms sustain the initial hypothesis to the extent that a higher social pressure will increase compliance and vice versa but defeat the second part that the large and medium-scale firms comply better than the small-scale firms.

3.4.3 Normative motivations and compliance performance

The results indicate that the only firm reporting a positive sense of duty to comply also recorded very good compliance performance whereas the firms indicating a negative sense of duty to comply equally recorded poor compliance performance. The compliance performance of the remaining firms who reported a conditional duty was mixed (Table 3.2). In sum, the results show a fairly strong relationship between the firms' felt sense of morality and their compliance performance. Across the firms, the small-scale demonstrated a better sense of duty to comply than the large and medium-scale firms.

Also, the findings reveal that the only firm supporting the regulation as reasonable also recorded very good compliance performance whereas the remaining firms with reservations about the regulation recorded a mixed compliance performance score. In sum, the findings show a fairly strong relationship between firms' perceived reasonableness of the law and their compliance performance. Generally, there is not much variation among the firms in their perception about the reasonableness of the regulation.

Again, the study finds that all the firms who reported a positive perception about the agency scored very good or good compliance performance whereas those firms with negative perception about the regulators have mixed compliance performance. These results suggest a fairly strong relationship between how the firms perceived the regulatory agency and their compliance performance. Across the firms, the findings indicate a decline in the regulatory agency's legitimacy from the large through the medium to the small-scale (Table 3.2).

Generally, the findings sustain the first part of the hypothesis about the direct relationship between sense of duty to comply and compliance rate but negate the second part that the large and medium-scale firms comply higher than the small-scale firms.

3.4.4 Compliance variation among logging firms

The data shows that all the participating firms did not record the same compliance performance. Actually, a closer look at the results reveals significant levels of variations in terms of compliance performance among the different categories of firms (Table 3.2).

Overall, the findings indicate that small-scale firms better complied in all the three motivations studied than the large and the medium-scale firms.

3.5 Discussion

This section discusses the impact of the various motivations on the compliance-violation decision making of the firms' studied and variations in compliance among the three categories of firms studied.

3.5.1 Economic motivations and compliance performance

This sub-section examines how both deterrence (from state and non-state actors) and cost of compliance shape compliance performance.

3.5.1.1 Deterrence from the state

As shown in Table 3.2, most of the firms have a lower perception of deterrence from the state. This is primarily because of the state's lower sanction regime. Presently, there are two different sanction regimes for illegal logging. First, the logging manual (which is a code of practice for loggers) prescribes a maximum penalty of ten times the stumpage fee for each tree illegally logged. Based on the 2014 revised rates by the regulatory agency, the average stumpage fee for all timber species is about GhC24.00 per cubic metre[2]. This translates to a maximum prescribed sanction of GhC240.00/m^3.

2 Ghanaian cedi (GhC) (3.80=1.00 USD) as at 2014

Second, the Forest Protection Act (FPA) prescribes a maximum sanction of twice the market/commercial value of the tree illegally logged. Using a conservative average domestic market price of GhC400.00/m^3 as at 2014 puts the maximum penalty at GhC800.00/m^3.

For reasons that include interferences from influential persons within and outside the industry and possible inertia on the part of the regulatory agency, only the stumpage indexed penalty is applied. Nevertheless, once the penalty is paid, the illegal trees are restored to the logger. This makes it financially rewarding for firms to violate the rule because the commercial value of the trees is higher than the penalty for violation. Perhaps, the only exception is the two small scale firms (Table 3.2) who do not have their own logging and processing facilities and have to hire them from the medium and large-scale firms and sell the logs to them at half the commercial value. According to them, this, accounts for their higher perception of deterrence from the state.

During the interviews, the large and medium-scale firms reveal that, if the regulatory agency decides to impose the commercial value-indexed sanctions, they will be forced to close down with its adverse consequence on the economy including job losses, declined tax receipts and foreign exchange remittances. For most developing economies where such taxes and remittances are critical for socio-economic development and, job creation seen as crucial for maintaining public peace and stability, governments appear reluctant to impose severe sanctions on violating firms. Aware of this, they use their status within the economy to bargain for lower sanctions and thus perpetuate their violation behaviour. This finding supports studies that have shown once violators perceive the cost of violation is far lower than the illicit gain, it incentivises them to continue with the violation (Kagan et al., 2011; Winter and May, 2001)

Apart from the sanctions from the state, firms who export to the EU market and/or are engaged in forest certification processes express fear about consumer boycott/blacklisting and/or suspension of their licenses respectively when caught for illegal logging. Respondents explain that with the passage of the EU Timber Regulations[3], their EU buyers as a proof of due diligence on the legality of timber products export to them demand a lot of documentary evidence and that makes illegal logging a difficult venture now. Similarly, three of them (one large, one medium and one small-scale) who are engaged in forest certification, spoke about their fears due to the annual field audits undertaken at their operational areas by auditors of these certification bodies. Based on these assertions, it could be stated that a proper implementation of the FLEGT license under the Ghana-EU/FLEGT VPA is likely to make illegal logging more difficult for these firms.

3 The EU Timber Regulations came to effect on March 3, 2013 with the aim to reduce illegal logging by ensuring that no illegal timber product can be sold in the EU. It was created as part of the EU's FLEGT Action Plan and prohibits operators in the EU from placing illegally harvested timber and its derivatives on the EU market

The EU has been Ghana's longest timber trade partner and presently offers the most competitive price for Ghana's timber products (TIDD 2014). Consequently, many of the export-oriented firms do not want to lose out on the EU market. For these firms, particularly the large and medium-scale therefore, [its] the informal sanctions from these non-state actors that compel them to comply higher than the sanctions from the state regulator. This is an important finding as it demonstrates that there can be high level of compliance even when perceived deterrence from the state regulatory agency seems low. This is because such deterrence could come from other third-party sources. In a study about tax compliance among Chinese lawyers, Rooij (2016) found that even when the state enforcement is weak to non-existent, these lawyers still perceived a high risk of breaking the law, because such risk came from other sources including their own clients and their partners.

This finding is consistent with literature indicating that the deterrent effect on compliance behaviour does not only originate from certainty and severity of sanctions from state institutions, but also from non-state actors (Vandenbergh, 2003; Rooij, 2016).

3.5.1.2 Cost of legal operations

For most of the firms, harvesting only the legal trees allocated to them leads to losses. The principal reasons appear to be the fewer number of trees allocated to them and the high cost of operations. These sentiments were echoed by almost all respondents as the single most important factor that presently confronts the industry, and also militates against their efforts at compliance. This is how respondent (F5) sums it; *'illegal logging among logging firms is purely intentional and the primary reasons are the lower number of trees allocate to firms per year and the associated high operational costs. Any logging firm that gives other excuses for illegal logging is possibly being economical with the truth'.*

For purposes of sustainable forest management, the annual allowable cut for all species for all legal firms is set at 2 million m^3 whilst the installed capacity of all firms is projected at 5 million m^3 (Marfo et al., 2017). It came to light during the interviews that all the firms are operating between 40 and 60% of their installed capacity with the medium scale firms being the worst affected. It therefore appears that for the vast majority of firms reporting negative costs-benefits ratio, compliance does not appear to be a preferred option. For these firms, therefore, it is either they violate the law to stay in business or comply and eventually collapse. Many of them have opted for the former. This finding confirms earlier studies showing that rules imposing high cost of compliance on actors are honoured more in violation than in compliance (Osterman, 2016; Thornton et al., 2009)

3.5.2 Social motivations and compliance-violation performance of logging firms

This subsection addresses the impact of information about illegal logging, societal demands and social sanctions on the compliance performance of firms investigated. The study reveals that colleague logging firms engage in illegal logging. About them, this is how respondent F4 puts it: '*I do not think there is any logging firm who does not engage in illegal logging. All logging firms are guilty when it comes to illegal logging. From the very first day I entered into the timber business, I was made to believe by my mentors then that every logger is a thief and my firm is not an exception*'. This assertion raises a serious presumption, though rebuttable, that appears to have shaped a perception or norm of non-compliance among the majority of the firms studied. Thus, most other firms do it, so why should my firm be different? In this case, it may be said that non-compliance behaviour of any particular firm influences non-compliance behaviour in other firms.

Another source of social pressure found to shape non-compliance behaviour is the activities of chainsaw operators[4]. This is how F5 puts it: '*as long as the regulatory agency cannot guarantee the safety of the trees in our concessions, it makes no sense to leave all of them for chainsaw operators to come and steal them when we also have uses for them. Most of us loggers engage in illegal logging because of the activities of illegal chainsaw operators. We know it is not good but they force us into it*'. For these respondents, therefore, it is the wilful violation behaviour of the chainsaw operators that has triggered the current high level of violation behaviour among the logging firms.

Nonetheless, for the two firms (one medium and one small-scale) who reported that illegal logging activities by others do not affect their compliance, it is all about protecting their reputational capital built over the years. This is how respondent F3 explains it: '*in today's corporate world, good image and reputation in the eyes of the public are extremely important and we would therefore not engage in any illegality to destroy or tarnish our reputation*'. This assertion is supported by respondent F9 who thinks that; '*good name and reputation are better than riches*'. This indicates that compliance could be improved if firms are educated about the importance of building and/or maintaining a good corporate image. This finding supports other studies reporting that there can be (voluntary) compliance even when there is limited deterrence from the state (Gunningham et al., 2011; Rooij, 2016).

4 They consist of individuals and unorganised groups who have no license to engage in logging business yet do so underground and even harvest more than the licensed logging firms. They use fuel-powered chainsaw machines to harvest timber trees and convert them in-situ to lumber for commercial purposes (a banned practice under the Timber Resources Management Regulations (TRMR, 1998). Nonetheless, they continue to operate mostly as armed guards at nights in virtually every forest area and supply the bulk of lumber on the domestic timber market (Boakye, 2015).

Generally, it could be deduced from the study that all the actors are virtually willing to operate legally once other firms and chainsaw operators do same. In other words, each firm expects others to halt illegal logging before it does same and so confirming previous studies that have established that most regulated entities, view the compliance or violation behaviour of their peers and competitors as the normal thing to do in business (Cialdini, 2007; Grasmick and Bursik Jr., 1990).

The study documents that demands from the local community for infrastructural development and other forms of social support on logging firms adversely impact on their compliance performance. This is well illustrated by respondent F2 as follows: '*the pressure on us from the forest fringe communities through the District Assemblies to the traditional authorities is unbearable. They all come to us for various support/assistance including maintenance of roads, construction of school buildings and money for celebration of festivals. They brand us wicked, and frustrate our operations if we do not assist them. These informal demands are too much and a huge financial drain on us. Where do we get the money to meet all these demands? They come from the extra trees we illegally harvest. It would be extremely difficult for us to meet all these unofficial obligations without illegal harvesting'*

Respondents were reluctant to discuss in further detail the exact amounts involved in these informal payments to local communities but maintain they are substantial and a huge drain on their finances. These payments may directly increase the operational cost of legal operation for the firms' concerned and thereby lower their compliance performance. Also, it could promote corruption that has been shown by various studies in the forestry sector globally to undermine efforts at compliance (Contreras-Hermosilla and Peter, 2005; Kishor and Damania, 2007)

Regarding social sanctions, no evidence is found to suggest that violation behaviour attracts any sanctions from fellow loggers or the local community. The general impression gathered from the study is that members are reluctant to interfere with the 'internal or personal affairs' of other members. This attitude of non-interference seems to shield non-complying members from the pressure or sanctions of few that are compliant. This is in sharp contrast with findings from other studies including the Massachusetts lobster fishers' Sutinen and Guavin (1998) that report the influence of peer-pressure in enhancing compliance performance among group members

The apparent lack of sanctions from the local communities could be attributed to so many factors. First, the violations may not be so visible to most people in the sense that they take place in forests that are located in remote areas. Second, many community members lack or have little interest or knowledge about logging operations particularly at the forest level. Third, in some local districts where these firms operate, they are the major employers and thus provide livelihood support to most of them. All these may have contributed to the apparent inaction of the community members and thus allowing these firms to perpetuate their violation behaviour

unsanctioned. Overall, it may be concluded that in this case study social norms largely help to undermine compliance performance.

3.5.3 Normative motivations and compliance-violation performance of logging firms

This subsection discusses the actors' felt sense of duty to comply (morality), perceived reasonableness of the rule and the perceived legitimacy about the regulatory agency and their impact on compliance performance.

For the one small scale firm who indicated a positive felt sense of moral duty to comply, illegal logging is a serious moral issue for reasons that include religious beliefs (i.e., hope in eternal life) and the need to protect the forest for posterity. For this firm, compliance has nothing to do with legal or informal sanctions but solely on moral principles and any violation would lead to guilt feeling, moral stigma and shame. Persons with such strong moral commitment have been found to exhibit the deepest level of compliance with regulation (Grasmick and Bursik Jr., 1990). However, Raakjaer Nielsen and Mathiesen (2003) warned that compliance based solely on personal morality could be eroded when violation becomes widespread.

For most respondents, illegal logging is justifiable under certain circumstances. This view is well articulated by respondent (F1) as follows: *'do you think the thief does not know that when he steals, he has violated the law that prohibits stealing? He knows but sometimes steals out of necessity. For instance, if the regulatory agency gives me twenty red woods and I need four extra to complete my contract, what should I do? I would try my luck where possible. If you want to violate any law, be careful how you go about it. Don't do it too much. If you steal too many trees, you destroy the forest and the future of your own firm. Steal when it is extremely necessary but even then, one has to be moderate'*.

It may be said that for these respondents, illegal logging is justified under conditions of necessity. Curiously, these are conditions that invariably foster their' economic interests. In sum, for the majority of respondents, illegal logging appears wrong but an economic necessity. For these 'conditional moralists', therefore, Sutinen and Kuperan (1999) suggest, it is possible to strengthen their morality through education and persuasion.

However, for two firms (one large and one medium-scale), decision to comply or violate is purely an economic one and not about morality. For them, they either violate or comply depending on whether it makes economic sense or not. Such apparent lack of morality or its reduction to financial considerations could have serious implications for compliance. First, it suggests that the regulation in question has not been internalised into the morals of respondents, and therefore, eliciting voluntary compliance from them may prove difficult (Vanderburgh, 2003). Second, it becomes difficult for the regulatory agency to reverse this development through education or persuasion as suggested by Sutinen and Kuperan (1999). Another possible explanation for the low morality among the loggers could be the crisis situation that most of them find themselves in at the moment. Adam and Nsen-

kyire (2014) reported that about 60 logging firms, mostly in the medium and small-scale category, have collapsed within the last decade due basically to lack of raw materials and high operational cost.

On reasonableness of the rule, the only firm who reported a positive perception about the regulation thinks the current generation has a duty to ensure that future generations also benefit from the country's forest resource. However, the vast majority of the firms have serious reservations about the rule and the basis for allocating the legal yield (i.e., trees for logging) including the fewer number of trees allocated to them which make logging operations uneconomical and thereby resulting in the near collapse of their businesses.

The fact that majority of the actors have qualifications about the rule may signal a possible imposition on them. Put differently, the actors may not have been involved in the law-making and/or decision-making process. Evidence from fishery studies in Denmark (Raakjaer Nielsen and Mathiesen, 2003) indicates that perceived alienation of regulated actors from law and/or decision-making processes have negative impacts on compliance behaviour. Also, for these respondents, violation could emanate from principled disagreement with regulation they perceive as unreasonable (Tyler, 1990). The resultant effect is that actors perceive the rule and its implementation as unreasonable and unworthy of compliance. A possible evidence of their resistance to the law is the observed violations.

Regarding the perceived legitimacy of the regulatory agency, some of the actors think the regulators are doing a great work in the sense that they fairly discharge their duties. The perception of the majority is not that pleasant. *This is how respondent (F6) puts it: 'I have no doubt that the FC field inspectors take bribe and help logging firms to steal trees. In my estimation, about 60 percent of illegal harvesting cases happen with the knowledge and/or consent of some FC officials. I may be wrong but this is my opinion'.* This perception of the regulated actors about the regulators is serious because it is this perception that eventually shapes their compliance behaviour. It is even possible that, these firms, aware of the corrupt practices within the regulatory agency may exploit it to perpetuate their violation behaviour. Corruption, either real or perceived and in its different forms (i.e., petty or grand), has been shown by studies in various sectors including forestry to undermine efforts at compliance worldwide (Cerutti et al., 2013; Kishor and Damania, 2007). Again, the inability of the regulatory agency to vigorously enforce the ban on chainsaw operation presents a huge challenge for it to enforce the rule on illegal logging against logging firms. The respondents consider it unfair for the regulators to tighten the belt on them while the chaisnaw operators continue to operate with impunity. The end result is the declining legitimacy of the regulatory agency with its possible manifestation in low compliance performance.

3.5.4 Compliance variation among the logging firms

Table 3.2 clearly suggest that overall, the small-scale firms recorded a higher compliance performance under all the three main motivations than the medium and large-scale firms. On deterrence, they are the only category who reported higher deterrence perception of both state and non-state actors. This could be due to the fact that two of them sell their products on the domestic market and do not make as much profit as their counterparts, thus generally making violation behaviour unprofitable. For the medium and large-scale firms, those who export to the EU market recorded a higher compliance performance than their colleagues who trade on the ECOWAS and the Asian markets due to the higher deterrence perception in the former market.

The small-scale firms also recorded a higher compliance performance with social norms than the medium and large-scale firms. The main reason here appears to be the low community demands on them. This variable appears to weigh heavily on the other two categories with the large-scale firms being the worse affected

Again, the small-scale firms performed better on normative motivations than their counterparts. Their felt sense of duty to comply with the regulation and perceived reasonableness of the rule were much better than the medium and large-scale firms. Overall, this finding appears to support the strand of literature that indicates that larger scale firms perform poorly at compliance in the sense that they can use their influence and power to postpone or evade compliance or to protect them against enforcement, particularly if they happen to be dominant employers- in the sense of being responsible for a significant amount of income in a given area (Huisman, 2001; Vaughan, 1983).

3.6 Conclusions

This empirical case study examines the compliance behaviour of Ghanaian logging firms with respect to the legal rule that prohibits them to engage in illegal logging. The study finds that all the three variables investigated (i.e., economic, social and normative motivations) have both positive and negative effects on compliance performance of all the categories of firms. Specifically, the findings clearly indicate that deterrence from third party non-state actors produces better compliance than the state. Also, firms with positive cost-benefit ratio for legal operations comply better than those with negation cost-benefit ratio. Normative motivations and social pressures largely help to undermine compliance performance. Overall, the small-scale firms recorded a higher compliance performance in all the three main compliance variables than the medium and large-scale firms.

This study about loggers in Ghana has some important implications for both compliance literature and practice. First, the study finds that, at their present levels, sanctions from the state for illegal logging particularly the stumpage fee-indexed penalty provided under the logging manual are low and create a huge incentive for loggers to violate the logging regulation. It should be understood that for rational or profit-oriented regulated actors, rules that provide higher financial rewards/benefits than sanctions [when violated] are more likely to be honoured in violation than in compliance. A policy insight for Ghana and countries that desire to enhance compliance under such situation must be to implement measures that counter the violation effect of low sanctions. Actually, this suggestion is the basic assumption underlying deterrent-based compliance. Thus, a higher sanction severity increases compliance and vice versa.

Second, the findings revealed that for firms who export into the EU market and those engage in forest certification processes, particularly the large and medium-scale firms, [its] the informal sanctions from these non-state actors that compel them to better comply than the sanctions from the state regulator. A theoretical insight from here is that deterrence can originate from other sources than just the state and its sanctions (Grasmick and Bursik Jr., 1990; Rooij, 2016). In this study about logging firms in Ghana, such deterrence has been shown to emanate from the EU market and private international forest certification bodies. The policy implication here is for the state regulatory agency to re-examine the current regulatory design that has state policy and law as the sole instrument category in favour of one that uses different instruments implemented by a number of non-state parties (commercial and NGOs). Such a framework, according to Gunningham (2011) helps to achieve not only better policy outcomes at less cost but also frees up scarce [state] regulatory resources, which can be redeployed in circumstances where only direct government intervention is available. In this respect, a network of both local and international actors would be desirable.

Third, the study finds some firms, though small, who would not engage in illegal logging for reasons aside from deterrence such as maintaining good reputation or status in their community, religious beliefs (i.e., hope in eternal life) and the need to protect the forest for posterity. This is an important finding and demonstrates that compliance is possible with limited to no deterrence. This suggests that regulators can enhance compliance through non-deterrent and inexpensive means including the use of simple messages or adverts that encourages actors that compliance is good and the right thing to do.

All this demonstrates that enhancing compliance is complex phenomenon and not just a straight forward calculation of increasing sanctions to achieve a higher level of compliance as deterrence theory would like us to assume. More than that, compliance has other dimensions as well including social, normative and even political. What is important then for policymakers and practitioners to enhance compliance among various regulated actors

is to understanding how different actors respond to different compliance motivations under various socio-politico-economic and cultural settings. Here, much research is still required to ascertain how these factors either functioning independently or in their combination shape compliance behaviour in regulated actors.

Appendix A. Measuring compliance and independent variables

Items		Brief statement of interview questions	Description of the relevant coding		
Compliance-Violation behaviour			Very good	Good	Poor
Timber harvesting		Do you always harvest only the legal trees allocate to you? If not, how many times have you harvested more than were allocated to you within the last two years?	Firms' who reported between zero and two violations	Firms' who recorded three and four violations	Firms' who recorded more than five violations
Independent Variables			High	Low	
Economic (Deterrence[5])	Sanction severity from the state	How do you compare the official penalty/ cost for illegal logging to the revenue obtained from the sale of the trees?	Individuals who indicated the official penalty/cost was higher than the revenue obtained	Individuals who reported otherwise	
	Perceived risk of Sanctions from non-state actors	Do you perceive any risk of sanctions from source other than the state for breaking the rule? To what extent does such risk influence your compliance behaviour?	Individuals who indicated such risks exist and impact on their compliance behaviour	Individuals who reported otherwise	
			Positive	Negative	
Operational cost-benefit calculations of compliance		How do you evaluate the profitability of legal and illegal operations?	Individuals who indicated legal operations were profitable than illegal operations	Individuals who reported otherwise	

5 The study concentrated on the element that deterrence literature considers most crucial to achieve compliance-sanction severity (Paternoster and Simpson 1993; Thornton et al., 2005)

			Positive	Negative	
Social motivations	Impact of information about illegal logging on firms	Extent to which information about illegal logging from colleagues and chainsaw operators impacts on your compliance behaviour	Individuals who indicated information about illegal logging adversely impact on their compliance behaviour	Individuals who reported otherwise	
	Social sanctions for illegal logging	Have you ever been sanctioned or targeted for sanctions by either the local community or your trade association?	Individuals who reported they have never been sanctioned by any of the two actors	Individuals who indicated otherwise	
	Impact of community demands on firms	Extent to which demands/pressures from the local community for support impact on their compliance behaviour	Individuals who indicated community demands adversely impact on their compliance behaviour	Individuals who suggested otherwise	
			Positive	Negative	Conditional
Normative motivations	Duty to comply	Do you have a felt sense of duty to comply with the rule on illegal logging?	Individuals who indicated they have a duty to comply	Individuals who reported they have no duty to comply	Responses that reported it depends on the situation at hand
	Perceived reasonable-ness of the law	How do you perceive the reasonableness of the rule on illegal logging?	Individuals who reported the rule was reasonable	Individuals who suggested otherwise	
	Perceived legitimacy of the regulatory agency	How do you perceive the fairness of the regulatory agency in the application of the rule?	Individuals who indicated it applies the rule fairly	Individuals who reported otherwise	

4 Understanding motivations for violation of timber harvesting regulation: The case of chainsaw operators in Ghana

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4.1 Introduction

Illegal logging causes environmental degradation, loss of biodiversity, social conflicts and destruction of areas of cultural significance/heritage as violators do not comply with environmental standards or best logging practices. Illegal logging and illicit trade in timber products are also noted to be depriving developing economies of billions of dollars in lost revenues and development opportunities (World Bank, 2012). In Ghana, the government estimates the annual loss of revenue from illegal logging at between USD 8 and 13 million, equivalent to 2% of the country's gross domestic product (GoG, 2012).

Research suggests that chainsaw milling of logs is the most common form of illegal logging in Ghana (Birinkorang et al., 2001; Hansen and Treue, 2008; Marfo, 2010). Chainsaw milling refers to the use of fuel-powered chainsaw machines for harvesting timber species and converting the logs in-situ into lumber (Odum, 2004). Chainsaw machines were introduced into Ghana in the early 1960s by the licensed logging firms to replace manual saws and felling axes for harvesting and cross cutting trees. Later farmers came to employ chainsaws for harvesting large trees during land preparation for agricultural crops. However, the practice of using chainsaw machines to mill logs into lumber for commercial purposes commenced from the economic crises in the 1970s where the formal timber sector nearly collapsed but became pervasive in the mid-1980s following the repatriation of about a million Ghanaians from Nigeria (Marfo and McKeon, 2013).

Ever since, the practice has become widespread within the country, employing about 97,000 persons along the entire production and marketing chain (Marfo and Acheampong, 2011). Recent study by Marfo et al., (2017) using field survey data with 2014 as the snapshot estimated that chainsaw lumber accounts for about 1.102 million m^3 (72%) of the annual national production of timber products (mainly lumber) traded on the domestic market valued at GhC 544.39 million[1] based on the average market price

1 Ghanaian cedi (GhC) (3.80=1.00 USD) as at July 2014

of GhC 494.00/m^3 for all species. The study projected the potential stumpage fee lost, using an average stumpage fee of GhC 24.00/m^3 based on the 2014 revised rate at GhC 26.00 million. This figure is about three times the amount (i.e., GhC 8,961,595.14) collected by the Forestry Commission as stumpage fee from the licensed logging firms in 2014. In terms of marketing outlets, chainsaw lumber is traded across all the ten administrative regions of Ghana and within the West African sub-regional (ECOWAS) market. The major patrons of chainsaw lumber in Ghana include individuals, woodworking artisans, real estate developers, overland exporters and contractors of the metropolitan, municipal and district assemblies (MMDAs).

As part of a broader policy and legal measures to address the problem in Ghana, the Timber Resources Management Act (TRMA, 1997) and its operational instrument, the Timber Resources Management Regulations (TRMR, 1998) were enacted to criminalise the practice of using chainsaws for milling logs into lumber for sale, exchange or any commercial purposes (TRMR 1998, reg. 32). Notwithstanding the above regulations, the practice persists, making it a problem for forest regulators. It is also worrying when viewed against the backdrop of Ghana's obligation under the voluntary partnership agreement (VPA) with the EU that commits her to improve forest sector governance including implementation of measures to ensure that only legal timber products are traded on both domestic and the EU markets.

Earlier studies on illegal chainsaw milling in Ghana could be grouped into three clusters. The first cluster of research investigated the general causes and adverse impacts of chainsaw milling. For the causes, the results revealed flawed policy and legal framework, land and tree tenure problems, poor farming practices and population pressures among others while the adverse impact ranged from environmental through social to economic (Appiah et al., 2007; Blay et al., 2007; Odum, 2004). The second cluster of studies examined the socio-economic context of chainsaw milling particularly its contribution to the economy in terms of employment, livelihood and infrastructural support to the forest fringed communities (Hansen et al., 2015; Marfo and Acheampong, 2011; Obiri-Darko and Damnyag, 2011). They found out that illegal chainsaw milling helps to sustain rural economies and livelihoods, and that the continuous existence of the ban has fueled illegal practices and conflict in the sector. The third cluster of studies considered chainsaw milling production and the extent of illegal logging by the chainsaw operators. The results estimated the annual timber harvest at between 1.7 million m^3 and 2.5 million m^3 (Birikorang et al., 2001; Hansen and Treue, 2008; Marfo, 2010).

However, little scholarly attention has been devoted to compliance-violation behaviour and factors that shape such behaviour (Hansen, 2011; Ramcilovic-Suominen and Hansen, 2012). Hansen (2011) examined law compliance in the case of on-farm timber extraction with rules that require timber operators; to obtain prior and informed consent from the farmers, to pay appropriate and timely compensation for crop damage during timber extraction and chainsaw milling. The study documents low level of compli-

ance in all the three domains. In another study, Ramcilovic-Suominen and Hansen (2012) investigated farmers' compliance with rules that regulate timber harvesting on farmlands, farming in forest reserves and use of fire on farmlands. The findings indicate high levels of compliance with farming and fire rules but low compliance for timber harvesting rule. None of these studies primarily focused on violation motivations of chainsaw operators. This study, therefore, makes an exploratory study to understand the noncompliance behaviour of chainsaw operators in Ghana with respect to forestry regulations that prohibit them from harvesting timber and milling in-situ into lumber for commercial purposes and, conditions that foster such behaviour.

The present study in Ghana is relevant because a better understanding of noncompliance behaviour and associated motivations could help design responsive policy interventions in Ghana and lessons learnt shared with other developing countries where compliance with enacted laws in natural resource management remains a challenge.

4.2 Theoretical framework

The socio-legal literature on what shapes individuals and regulated entities compliance-violation behaviour points to three main theories namely, deterrence, social and normative (Kagan et al., 2011; Thornton et al., 2009; Winter and May, 2001). The deterrence theory is based on standard economic conception that regulated actors behave rationally to maximize their utility and would comply with a given regulation when they estimate that the benefits outweigh the costs (Becker, 1968; Ehrlich, 1972). With this theory, the key variables that determine compliance are perceived detection risk and sanction severity. Empirical evidence suggests that perceived detection risk and sanction severity are important for regulatory compliance (Harrison, 1995; Thornton et al., 2009). This means that, at least in theory, compliance can be elicited through enforcement (i.e., detection and sanctions). It could also mean ensuring that sanctions for noncompliance always exceed the illegal gains. According to Young (1979), compliance can also result from inducement (i.e., lower compliance costs or higher benefits for compliance).

However, the basic deterrence theory does not provide satisfactory explanation to all instances of compliance when perceived detection and/or sanctions are low or even nonexistent. For instance, Sutinen and Kuperan (1999) report that many fishers in Malaysia comply with fishing regulations despite large potential illegal gains and small expected sanctions. Again, research has shown instances where some regulated actors actually go beyond compliance, in the sense of doing more than what is specified under a given regulation (Hutter, 1997; Thornton et al., 2009). The normative and social theories or perspectives of compliance behaviour attempts to provide answers to some of these shortcomings in the standard deterrence theory.

From the normative theory, regulated actors consider what is the right thing to do (personal morality or civic duty), reasonableness of the rule and,

the legitimacy of the authority or institution that made and/or enforces the rule (Levi et al., 2008; Sutinen and Kuperan, 1999; Tyler, 1990). Personal morality refers to an internal obligation to follow one's own sense of what is right or wrong. Here, compliance is based on the internalized values of the regulated actor and not on material rewards or cost-benefit calculations. Studies have shown that appeal to actors' civic duty has helped increase tax payment (Kagan et al., 2003) and as a factor in success of anti-littering campaign in the US (Grasmick and Bursik Jr., 1990). Again, empirical evidence shows that, regulatory rules that become or are internalised into morals produce the deepest form of compliance, in the sense that violating such norms means violating one's own morals (Grasmick and Bursik Jr., 1990; Vandenbergh, 2003).

The second component of the normative perspective is reasonableness of the rule regulated actors are supposed to comply with. Levi et al., (2008) have shown that regulated actors generally comply with rules they deem reasonable when even those rules offer them no direct material benefits. This is further illustrated by Raakjaer Nielsen and Mathiensen (2003) in studies of Danish fisheries regulations. They found that fishers were reluctant to comply with regulations they perceived as unreasonable. On this, Tyler (1990) explains that non-compliance stems from a principled disagreement with regulations or orders actors regard as arbitrary and unreasonable. To elicit compliance, therefore, Sutinen and Kuperan (1999) suggest that regulators and/or policymakers must ensure that regulations appear reasonable and make sense to actors.

The third component of the normative perspective is legitimacy- which refers to a feeling of obligation to obey law and defer to the decision made by legal authorities (Tyler, 1990). Prior studies, suggest that most people obey regulations emanating from authorities and institutions that they trust (Levi et al., 2008; Tyler, 1990). In the view of Sutinen and Kuperan (1999), legitimacy is a stock of loyalty that regulatory authorities can draw upon to ensure compliance. Here, compliance depends on actors being satisfied with the law-making processes (including participation, openness and accountability), the content and the outcomes of the decisions made by the authorities, in terms of consistent interpretation and fair application of the law (Honneland, 1999; Tyler, 1990). They suggest measures that include procedural fairness, joint or co-management, negotiation and other forms of cooperation between regulators and regulated actors to improve legitimacy.

In addition to deterrence and normative theories, sociological scholars have long documented the powerful influence that social norms have on the behaviour of individuals and regulated entities (Cialdini, 2007; Grasmick and Bursik Jr., 1990). Cialdini (2007) defines social norms as rules and standards that are understood by members of a group/society, which guide and/or constrain social behaviour without the force of laws. For instance, in their Danish agro-chemical regulations studies, Winter and May (2001) find that social norms are influential in enhancing compliance among farmers. Some research including Grasmick and Bursick Jr. (1990) and Cialdini (2007)

indicate that social norms, in general, strongly influence compliance decisions even when the imagined others are not friends and family members but are generalised society members. They also observed that even in polyethnic societies, the groups' views may be compelling enough to influence the behaviour of others.

Also, looking at the literature on developing countries one would find that 'the context' or contextual factors play a crucial role in influencing compliance-violation behaviour of regulated actors. Examples include insecurity, rural poverty and livelihood, the gap between law and local social realities, politics of patronage, nepotism, corruption, ineffective state institutions, enforcement challenges, competing normative systems, legal or normative pluralism, lawlessness as well as broader features of sociopolitical structures indirectly, but strongly, influencing compliance behaviour (Rooij, 2006; World Bank, 2009). Some recent studies that are instructive here include Ostermann (2016), that found poverty as the principal driver for noncompliance with regulations on fuel wood collection within conservation parks along the India-Nepal border, and research on commercial sex workers in China that suggests necessity as the key factor for violation of regulations on prostitution (Boittin, 2013).

Although the theories on compliance behaviour presented above do provide rich understanding of regulatory behaviour, they do not completely explain actors' responses to regulation. A detailed review of the available literature points to other factors that directly or indirectly help to shape compliance. For instance, Coleman (1987) has shown that some instances of violation are due to the regulated actors' lack of capacity to comply. In this case, rules that require the impossible or are difficult to comply with will lead to more violation. Huisman (2001) explains that with this perspective, violation of law derives from not being able to comply instead of not being willing to. Empirical evidence in industrial safety and pollution control studies suggests lack of capacity in terms of the regulated actors' inability to acquire some equipment, technology, information or expertise as the reason for noncompliance with related laws (Genn, 1993; Kagan et al., 2011; Rooij, 2006).

Some research including Genn (1993) indicates that knowledge or awareness of the rules plays a critical role in compliance. They argue that if regulated actors do not know the law, they are unable to adjust their behaviour accordingly. Others emphasise the regulators' enforcement style in the sense of attitude towards and/or treatment of regulated actors, cost of compliance in terms of money and time (Yapp and Fairman, 2004), managerial incompetence, improper attention to regulatory requirements and systems failures (Hutter, 1997; Kagan et al., 2003).

Again, other studies have considered various extensions or modifications to the basic compliance models including those that integrate the various perspectives or look at their interactions to explain compliance behaviour. For instance, Sutinen and Kuperan (1999) formulated the enriched compliance model, which integrates the standard deterrence theory with normative and social motivations to explain the Malaysian fishers' compliance-vio-

lation behaviour. Also, Gunningham et al., (2003) developed the 'licensed model'- which views compliance with environmental regulation as shaped by the interaction of three licenses namely, economic, regulatory and social.

In the case of forestry or timber harvesting regulations, little research work has applied such knowledge to explain how and why forest sector actors comply or violate the related laws (Contreras-Hermosilla and Peter, 2005; Schmidt and McDermott, 2015; Tacconi, 2007). They found, among others, bureaucratic and stressful legal processes, high demand for timber products, lack of clarity in the law and/or its interpretation, corruption, flawed policy and legal framework, livelihood needs, poverty and low enforcement capacity as some of the factors that account for noncompliance with forest conservation regulations. In the Ghanaian context, much less research data exists on the application of compliance theories to understand compliance-violation related behaviour of the various forest sector actors. The present study draws on data obtained through in-depth semi-structured interviews with chainsaw operators in Ghana and their relation to the existing compliance literature with the view of understanding their noncompliance behaviour.

4.3 Methods

This study seeks to understand the motivations that shape the violation behaviour of chainsaw millers in Ghana with respect to legal rules that prohibit them from harvesting timber and milling in-situ into lumber for commercial purposes. Violation is understood here as wilful or deliberate noncompliance with the above rules whereas violation motivation is what drives individual chainsaw operators to infringe on the stated legal rules. First, the study seeks to find out the views or perceptions of the selected operators on the factors that foster noncompliance and second, why the chainsaw milling operation has persisted despite the ban.

4.3.1 Selection of study area and respondents

This case study focuses on the Ashanti Region of Ghana. The choice is relevant in many respects. First, Kumasi, the capital city of the selected region alone is home to about 60% of the logging firms in Ghana (TIDD, 2011). The region can thus be described as the hub of the timber industry in Ghana. Second, it has 61 gazetted forest reserves, covering an area of 3,900 km^2, and thus makes the region the second most forested in Ghana (Affum-Baffoe, 2008), and an important productive site for chainsaw milling. Third, according to Marfo et al., (2017), the region has the largest market for chainsaw milled lumber in Ghana, accounting for about 30% of total annual consumption.

As in all illicit operations, the exact number of people involved in this operation is unknown but Marfo and Acheampong (2011), put the number nationwide at about 97,000 across the entire production and marketing

chain[2]. Admittedly, the scope of chainsaw operation under the regulations is broad. However, the present study focuses only on one of the important actors in the entire chain- the chainsaw machine operators who do the actual harvesting and milling of the trees (i.e., the producers). The exact number of chainsaw machine operators in Ghana or the Ashanti Region is unknown. A total of forty (40) individual machine operators scattered across the region were interviewed. The number could have been higher but the researcher achieved saturation around the thirty-fourth respondent. In other words, there was virtually no new information after this number. The snowball sampling technique was used in the identification and selection of respondents. The first couple of respondents were introduced to the researcher by chainsaw milled lumber vendors. Subsequently, these chainsaw operators gave information about other chainsaw operators. Table 1 gives an overview (profile) of respondents. This information is important as it helps to understand the socio-economic context of the regulated actors and how that relates to available theories on the influence of contextual factors on noncompliance behaviour.

Table 4.1 Overview (profile) of respondents (N=40)

Characteristics of respondents	Number	Percentages
Age		
20-29	28	70
30-39	10	25
40+	2	5
Gender		
Male	40	100
Female	0	0
Education		
No formal	18	45
Basic	20	50
Secondary	2	5
Residence		
Locals	28	70
Migrants	12	30
Average income/month		
Without chainsaw milling= (Ghc 120.00)	40	100
With chainsaw milling = (Ghc 300.00)	40	100

2 This includes *tree spotters, who search for trees to be harvested; operator boys, who provide various forms of assistance to the machine operators such as carrying the chainsaw machines, spare parts and clearing around trees to be harvested; machine operators, who actually harvest and mill the trees; ; loading boys, who carry by mechanical means the milled lumber from the forest floor to the roadside, load and off-load trucks; transport operators, who use their trucks to convey the lumber from forest to the marketing centres; spare parts dealers, who sell chainsaw machines and their accessories; repairers of chainsaw machine, who specialise in the maintenance of chainsaw machines; table saw operators, who re-saw the lumber into various dimensions at the marketing centres, and wood merchants/vendors, who retail the chainsaw lumber domestically*

4.3.2 Data sources and analysis

The research design combined semi-structured interviews with field observations. All the interviews were conducted face-to-face, thus allowing for further invaluable analyses of the demeanour of the respondents aside from their responses. The preferences of the respondents did not permit any of the interviews to be electronically recorded. Under such situation, the researcher had to rely on field notes made either during the interview/discussion or immediately following its conclusion depending on the sensitivity of the respondents. All the interviews took place between March 2015 and August 2015. At the outset of each interview, the researcher disclosed his affiliation with the Forestry Commission as a regulatory official to respondents. Respondents were, however, assured that the purpose of the research was purely academic and that no information shared will be used against them at any time. The wood vendors who introduced them also assured them that the researcher has been there in the past to conduct similar interviews and thus guaranteed their safety. Those assurances helped put respondents at ease for the interviews to proceed without any inhibition. The researcher also had the opportunity to visit some forest reserves and areas outside forest reserve where chainsaw milling has taken place within the study area.

The interview topics were structured based on the main motivations (deterrence, social, normative and contextual) identified in the literature to shape noncompliance behaviour generally. Table 4.2 presents the motivations for noncompliance and the main interview topics covered under each of them. On average each interview took 75 minutes. Respondents are numbered serially from 01 to 40 with prefix "COP", (meaning chainsaw operator)

Table 4.2 Chainsaw operators' motivations for noncompliance with logging regulations

Non-compliance motivations	Main interview topics covered
1. Deterrence	• Perceived risk of detection • Perceived sanction severity • Impact of sanctions
2. Social motivations	• Extent of the chainsaw milling problem • Level of acceptance of chainsaw milling within the community • Social sanctions for violating chainsaw milling regulations
3. Normative motivations	• Morality of chainsaw milling operation • Reasonableness of the chainsaw milling regulations • Performance of the State regulators
4. Contextual factors	• Socio-economic factors

The interviews have been coded by keywords based, firstly on the conceptual framework with which the researcher initially had entered the research field and, secondly those empirical findings that fall outside this framework. This research therefore combines deductive and inductive approaches.

4.4 Results and discussion

This section combines the results of this empirical study with discussion about the main motivations of deterrence, social and normative together with other contextual factors found to shape noncompliance behaviour of the regulated actors studied.

4.4.1 Deterrence

This sub-section focuses on how the twin elements of deterrence (i.e., perceived detection risk and sanction severity) help to understand the observed violation behaviour among the actors under investigation.

4.4.1.1 Detection perception by the chainsaw operators

The first element of deterrence addressed is the perceived detection risk by regulated actors and how that influences their violation behaviour. A key finding here is that chainsaw operators understand that there are different levels of risk or detection perception associated with different operational areas and what cases are likely to be detected. First, respondents agree that illegal chainsaw milling in forest reserves generally is riskier than in areas outside with an explanation that enforcement officials concentrate most of their enforcement resources on protecting forest reserves than areas outside. Second, there is a higher perception of detection working in concessions or timber harvesting areas of licensed logging firms than in unencumbered areas. The reason is that some concession owners engage private concession guards or agents to provide extra monitoring and supervision in addition to that of the state regulatory officials.

Third, it was indicated that operating on farm lands with cash crops entail much higher risk than on fallow areas unless prior consent is obtained and adequate compensation paid to the farmer(s) for any crop damage. Respondent (COP 12) recounted an experience where a farmer reported him to the regulatory officials to seize his truck load of lumber because he could not agree with the farmer on an appropriate compensation for crop damage. Although famers do not own naturally-occurring timber trees on their farmlands in Ghana, they are entitled to compensation for any crop damaged during timber harvesting operations (FC, 1995). The practice therefore, is for chainsaw operators to secure the consent of the farmer and pay the right compensation before they proceed to work. Chainsaw operators who understand this practice even get farmers to invite them to harvest trees

on their farms albeit being an illegal practice under regulation 34, TRMR 1998. This finding appears consistent with some earlier studies that have documented farmers aiding chainsaw operators in their illegal operations by selling naturally-occurring trees on their farmlands to them (Hansen, 2011; Marfo, 2010).

Another finding is that the chainsaw operators calculate the risk of detection to be high and have therefore developed various strategies to minimize such risk. First, they plant informants or agents at vantage points close to where they are working to alert them (through blowing of whistle) of any approaching enforcement official. Second, in most instances, chainsaw operators work in remote areas of the forest or deep at night and/or on weekends and public holidays when they know the regulatory officials are off duty. Third, there are allegations of chainsaw operators making informal payments (bribes) to some regulatory officials who then assist them in their illegal operations. This is how respondents (COP 20 and COP 26) put it, *'we pay them before they allow us entry into areas under their jurisdiction to operate. They charge us between GhC400.00 and 800.00 per truck load of chainsaw lumber depending on the tree species harvested and/or the size of truck used to convey the lumber'*. This assertion confirms some earlier studies that hinted that regulatory officials take bribes from chainsaw operators and aid them in their illegalities (Ameyaw et al., 2016; Marfo, 2010).

All these strategies may have helped the actors to escape detection and arrest by the enforcement agents and possibly might have convinced them that there is reduced likelihood of being caught. A perception is likely to have been created that they can violate the regulation and go undetected. Under such situation, the risk associated with violation is drastically reduced and this in turn may stimulate more violation as actors are no longer deterred due to the reduced detection perception. This finding supports research that has suggested that violation is more likely to increase when detection perception is low (Genn, 1993; Sutinen and Kuperan, 1999)

4.4.1.2 Sanction severity

The second element of deterrence examined in this study is sanction severity and how it influences the violation behaviour of actors under investigation. The study finds that respondents possess accurate information about the sanctions associated with violation of the law through their interactions with the regulatory officials. Furthermore, the study reveals that respondents have developed strategies that help them to mitigate or minimize the prescribed sanctions. First, some of them make use of influential persons in the community including Traditional Authorities, Members of Parliament (MPs) and District Chief Executives (DCEs) to plead for them to have the sanctions either avoided or mitigated. This is how respondent (COP16) sums it; '*when you are arrested and you know of any influential person (MP, DCE or Chief), you approach him to assist you. We do help them to campaign and vote for them in elections so they also have to help us when we get into trouble. MPs and*

DCEs who do not help in this regard are deemed unsupportive and cannot count on our votes in future elections'.

A second strategy is for them to bribe the regulatory officials that arrest them to restore the lumber to them. According to respondent (COP 16), many chainsaw operators have their financiers or "big men" in the urban centres who come in to bail them whenever they get into trouble with the regulatory officials. These financiers are alleged to have links within the higher ranks of the regulatory agency that help them in times of trouble. Earlier study by Hansen and Treue (2008) notes that, these financiers are urban elites who sponsor the chainsaw operators in the rural communities and cream most of the profit from the illegal chainsaw milling business.

Another finding is that respondents do not have the same perception of risk of punishment. Respondents who have been in the business for long time (five years and above) generally have lower perception risk of punishment than the new entrants (under five years). This may result from past involvement in the illegality and discovery that they can get away with it through any of the means enumerated above. Another reason could be possible familiarity and/or fraternity with the regulatory officials that have reduced their estimates of the risk involved.

In sum, it may be said that the current sanctions regime is unlikely to deter violators from engaging in the illegal practice. Apart from being lower than the financial gains, there are influential persons at the local and regional levels that in most instances jump to their defence to bail them out completely or have the sanctions mitigated for reasons that include economic, social and political. Under such condition, the use of threat of sanctions as a policy mechanism to elicit compliance pales out and the violation persists. This finding is consistent with studies indicating that low detection probability and sanction severity increase the likelihood of violation (Becker, 1968; Gray and Scholz, 1991; Kuperan and Sutinen, 1998).

4.4.2 Social motivations

A key finding here is that illegal chainsaw milling has wide social acceptance among the rural communities and even within the larger Ghanaian society for a lot of reasons. First, it helps to create jobs for the youth in and around the local communities where they operate. This includes carrier boys, who assist in conveying the processed lumber from the stump site to the road side and loading boys, who load the lumber onto trucks which transport them to various marketing centres. Finally, there are vendors and those who re-saw the lumber to the specifications required by the various customers. This suggests that the violation of the law is not only related to the (economic) interests of the chainsaw operators but also many others who depend on the illegal operation for their livelihoods. This means ensuring strict compliance will adversely affect, not only the livelihoods of the operators but, all others who depend on this illegal activity either directly or indirectly for sustenance.

Second, the chainsaw operation helps in the infrastructural development of the local communities, a sure necessity in most rural communities in Ghana. The contribution is either in cash or kind towards important social amenities/projects such as school buildings, clinics and bridge construction. The study finds that in some communities there is a fixed amount of money they must pay to the community leaders either for every truck load of lumber transported or trees harvested. This arrangement usually applies to migrant operators (i.e., operators who are non-residents). In other words, it is mandatory for them to assist the community in cash or kind for developmental purpose. However, local operators (i.e., those residing in the community where they operate) appear not to be under any such obligation except for payment of compensation for crop damage during operations.

Third, there is high acceptance of chainsaw milling lumber on the domestic market. It's readily available and relatively cheaper than lumber from the licensed logging firms. A study by Obiri-Darko and Damnyag (2011) puts the price difference at between 20 and 74% for same species and dimension. The licensed logging firms are reluctant to supply lumber to the local market due to the higher price on the export market (TIDD, 2011). This has resulted in a high demand and patronage of chainsaw milled lumber on the local market and the neighbouring countries up north. This confirms observation by Passas (2002) that, violation or criminal activities persist as long as the goods and services provided by them are in great demand by the populace.

The study finds no evidence to suggest that violation behaviour leads to any social sanctions from fellow chainsaw operators, family members or the community at large. The only possible exceptions are when a farmer reports to the enforcement officials chainsaw millers who refuse or fail to pay prompt and adequate compensation to them for crop damage, and when a member of a particular chainsaw gang/group is cheated in the sense of unpaid remuneration due him for assisting in the illegal practice. It appears from the findings that there is no considerable pressure from the social context on the actors to halt their illegal operations. Conversely, there seems to be a strong social support for the noncompliance behaviour due to the reasons enumerated above. These findings, thus confirm some literature that has hinted that deviant acts persist and even become more widespread when there is strong social acceptance, approval or reinforcement for such behaviour (Cialdini, 2007; Vandenbergh, 2003).

4.4.3 Normative motivations

The main aspects of normative motivations for compliance-violation behaviour considered in this study are morality, reasonableness of the rule and legitimacy of the authority charged to administer the rule. Regarding morality, a major finding is that the rule under study has not been internalised into the moral values of respondents, simply because violation appears normal to them and does not produce any shame or guilt-feeling among them.

Answering a question on whether they thought it was (morally) wrong to engage in illegal chainsaw operation, this is how respondent (COP 18) sums up the responses; '*morality does not come in when talking about chainsaw milling issues, it's about our livelihood and survival. Nobody is stealing from anybody; there is no shame or guilt-feelings about this*'.

This lack of moral restrain or reservation on the part of the regulated actors could be taken to mean that the practice has persisted for so long and/or has become so widespread that it has eroded any morality among them. For these respondents, the 'violating behaviour' appears to be good for one's social and economic development and just not breaking the rules on timber harvesting. Under such circumstances, voluntary compliance is less likely to come from them and this possibly helps to explain why violation of the rule is widespread. This finding is consistent with existing regulatory literature indicating that when regulated actors do not agree with a regulation based on moral grounds there will be a higher chance of violation (Grasmick and Bursik Jr., 1990; Kuperan and Sutinen, 1998; Vanderburgh, 2003).

The second component of normative norms considered is respondents' perception about the rule under study and how it influences their violation behaviour. The study shows respondents' general displeasure with the regulation and call for a more equitable rule that would allow them to operate legally. This is how respondent (COP 12) puts it: '*we are tired of this cat and mouse game; we see the regulatory officials and run away or hide, they see us and arrest us. This game must stop! We want a regulation that will grant us timber harvesting rights to work and earn a decent living. Any other law that seeks to deprive us of this right would be vehemently resisted*'. A proposal put forward by them is that the current regulations be changed to allow chainsaw operators produce lumber for the local market whilst the licensed logging firms concentrate on the export market. This suggestion appears to be in consonance with the existing de facto practice in Ghana where chainsaw operators are estimated to supply about 72% of lumber on the domestic market (Marfo et al., 2017) while the licensed logging firms export over 80% of their timber products (TIDD, 2014).

The above finding may signal two things. One is the alienation of actors from the law-making and/or decision-making process which has the potential to adversely impact on their compliance behaviour. Evidence from fishery studies in Malaysia (Kuperan and Sutinen, 1998) and in Demark (Raakjaer Nielsen and Mathiesen, 2003) indicates that perceived alienation of regulated actors from law and/or decision-making processes have negative impacts on compliance behaviour. Also, for these respondents, violation could emanate from principled disagreement with rules they perceive as unreasonable or unfair because they tend to strain their livelihood and survival needs (Levi et al., 2008; Tyler, 1990).

The legitimacy of the regulatory authority charged with the responsibility to enforce the rules is the last component of normative motivations addressed in this study. A finding here is that the legitimacy of the regu-

latory authority may have been compromised from the view point of the respondents since they are in most instances met with demands for informal payments (bribes) when arrested. The widely-held perception among the respondents is that some FC officials take bribes to facilitate their illegal operations. This account appears to support studies by Ameyaw et al. (2016) and Marfo (2010) that found FC officials taking informal payments from chainsaw operators.

It should be noted that, once actors recognise they can evade or minimise detection and/or sanctions by informal payments to regulatory institution; their perception about the legitimacy of such an institution is greatly diminished. In other words, corruption tag on regulatory institution lowers its legitimacy before its actors and thereby incentivise them to violate the regulation. In sum, the findings about normative motivations show that the documented high violation of the rule under study is a combined effect of regulated actors' weak morality, unreasonableness of a regulation that strains actors' livelihood and survival needs, and regulators' diminished legitimacy due to perceived corrupt practices. The findings thus confirm existing regulatory literature on the influence of normative motivations on compliance-violation behaviour (Levi et al., 2008; Sutinen and Kuperan, 1999; Tyler, 1990).

4.4.4 Contextual factors

The study reveals some important contextual factors that play a critical role in shaping noncompliance behaviour among the regulated actors. They include socio-economic (particularly poverty) and political factors.

The data in Table 4.1 shows that the average monthly income for all respondents without chainsaw income is about GhC120.00 but moves up to about GhC300.00 when combined with proceeds from chainsaw milling. Thus, even with revenue from chainsaw operation, the average person lives on about GhC10.00/day and without chainsaw income on about GhC4.00/day. Whichever way one looks at it, these are people who may be described as very poor. For these people, therefore chainsaw operation is used either to supplement their income or is their chief source of income. This is how respondent (COP 12) explains it; '*some of us do not have any academic or professional qualification that could land us a decent job. We have no formal education and this is the only business the youth in this community depends on for a living. Farming is the main occupation for the elderly in this area but due to land scarcity and marginal returns from farming most of the youth have resorted to this business for their livelihood. Halting chainsaw operations in this community will mean denying the youth their daily bread*'.

It appears evident from the findings that the socio-economic context of the regulated actors particularly poverty makes it virtually impossible for them to comply with the rules. It may be said then that for these respondents the violation of the regulation is not about unwillingness to comply but inability to do so (Huisman, 2001). This is because their livelihood and

survival are closely linked to the revenue derived from the chainsaw milling operation. This finding connects well with a study undertaken by Ostermann (2016) along the open India-Nepal border that reveals widespread poverty, as a major contributor to non-compliance with a rule that prohibits collection of fuel wood from conservation parks. As earlier pointed out, the market has also created a huge demand for the illicit products, thus making violation profitable, and coupled with lack of considerable pressure from the social settings on the actors to halt illegal operations has all contributed to the noncompliance behaviour.

Again, the political context appears favourable for the actors' violation behaviour. The point has already been made that many actors who have been in the business for long (five years and beyond) have developed ties with political authorities at the different levels of the governance structures. These influential persons normally step in to bail them out when caught and/or sanctioned. Perhaps, other indications of favourable political context for the widespread violation are the use of chainsaw lumber for some government funded projects in the country and the lack of political will by authorities to enforce the law at the market centres across the country where the illegal lumber products are openly sold (Boakye, 2015). These could create a perception in the minds of the actors about the political support for their illicit operations and thereby incentivise them to persist in such illicit practice. These findings connect well with some previous studies that have established the importance of contextual factors indirectly shaping noncompliance behaviour by altering the basic compliance motivations (Gunningham et al., 2003; Rooij, 2006; World Bank, 2009).

4.5 Conclusions

This study provides valuable insight into the motivations of actors who wilfully violate the regulations on timber harvesting in the context of a developing country. The findings, to a large extent, are consistent with regulatory studies that have underscored the importance of deterrence, social, normative and contextual factors in shaping violation behaviour among regulated actors. For Ghana to improve forest sector governance including the supply of only legal timber products to both domestic and the EU markets as envisaged under the Ghana-EU/FLEGT VPA, the study suggests a number of policy interventions. First, the findings point to the importance of deterrent/economic factors namely, low perceived sanction severity and financial gains in driving the violation behaviour. A way forward here is to put in place measures that negate the violation effect of low sanctions. In other words, it will mean introduction of stringent sanctions to make violation behaviour unprofitable.

Second, the huge gap in supply of lumber to the domestic market should be addressed. The demand for wood products in Ghana is unlikely to decline any time soon due to increases in population and infrastructural

development. With respect to this, a suggestion worth pursuing would be to license or convert some of the actors to legal small-scale millers to produce lumber for the local market whilst the licensed logging firms concentrate on the export trade. The operators could be organised into co-operatives and assisted to acquire harvesting areas/rights and portable processing plants. This suggestion is already being piloted under the EU-Ghana chainsaw project but there would be the need to scale it up for more actors to benefit under the scheme. Others, for example, Hansen et al., (2015) are more critical of this approach for reasons that include the possibility of the more resourceful, urban-operators, hijacking such permits and supports to the detriment of the rural-based operators. Though these possibilities could arise, they could be addressed when the regulators put in place proper measures and systems. The advantages of a properly implemented artisanal milling policy could include; employment creation at the local level, supply of legal lumber to the domestic market, erasing the perception that the existing rule discriminates against them and enhancing the rule of law.

Third, suggestions including expansion of the forest resource base through on-farm tree planting and other forms of plantation development, equitable benefit-sharing of revenue from forest management, alternative sustainable livelihoods for forest-dependent communities and awareness creation about the importance of the natural forests at all levels which have been made in the past (Blay et al., 2007; Boakye, 2015) are still relevant and worth pursuing. Actually, the government and its partners have in recent times begun to implement some of them but more needs to be done for the results to become apparent.

Fourth, the study highlights the significance of contextual factors in shaping violation behaviour. It appears from the study that the socio-economic context of the regulated actors is crucial in driving violation behaviour. The violators have no or little formal education, mostly unemployed with no sustainable livelihood and living at the fringes of the forests they perceive as their food basket. Under such conditions, any enforcement, policy or regulatory action that fails to address their precarious economic situation is likely to achieve little success. In this respect, the way forward is for the country to work out a more flexible, accommodative policy that seeks to balance forest resource conservation with human well-being, particularly for the rural forest dwellers (McShane et al., 2011; World Bank, 2009). This may be done in several ways. One way would be to review the existing legal framework on tree tenure in Ghana that vests all naturally occurring timber trees on farm and fallow lands in the President to allow farmers and landowners who nurture such trees to own them. This is likely to give the farmers and landowners enough motivation to protect them. Another approach would be for the regulator to actively engage the forest fringe communities and landowners in joint or co-management of the forests and equitably share the benefits that accrue with them. Such an arrangement could create a management responsibility and/or moral obligation on the part of the landowners and fringe communities to report

violators and thereby help not only to induce compliance, but also fosters sustainable management of the resource.

Fifth, the main regulatory authority should endeavour to purge itself of corrupt practices (both perceived and real) to improve their reputation and legitimacy, vital ingredients that can minimise violation and encourage compliance. A proposal here would be to introduce and enforce code of professional practice among the regulatory officials with stiffer sanctions. Complaint centres may be set up at all district and regional offices to receive complaints of unethical practices. Such complaints should be promptly investigated and swift actions taken against officials found culpable. Finally, even with well-developed policy measures, very little could be achieved without a strong political commitment and support at all levels of the governance structure.

5 Enforcement of logging regulations in Ghana: Perspectives of frontline regulatory officers

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5.1 Introduction

Law enforcement is an integral component of any regulatory regime and that no matter how well regulations and laws are drafted, they are unlikely to achieve their purpose without some form of enforcement. Studying enforcement of pollution control regulations in Australia, Gunningham (2011) observed that for regulation to work or achieve its purpose it must not only be well designed but also efficiently and effectively enforced. Several empirical studies show that enforcement actions in the sense of detection of violations and legal sanctions are crucial to regulatory compliance (Catedrilla et al., 2012; Harrison, 1995; May and Winter, 1999). Catedrilla et al. (2012) attribute a reduction in the number of fisheries laws violations in the Philippines to the strengthening of enforcement actions. Research in the US has shown that violations of occupational safety and water pollution regulations were less frequent in firms that have recently been visited by regulatory inspectors and fined for violations (Gray and Scholz, 1993; Scholz and Gray, 1990). In all this, enforcement acts as a negative incentive that induces regulated actors to refrain from unlawful practices. Enforcement is thus considered as an important tool that can help to ensure or increase compliance, which is central to any regulatory regime.

However, in most jurisdictions, the deterrent effect of enforcement is often weak or intermittent (Kagan, 1994). Stern (2008) reports that even in developed countries enforcement is only capable of detecting a small fraction of infringements. In developing countries, enforcement is commonly weak across all regulatory regimes (Akella and Cannon, 2004). Additionally, enforcement is significantly expensive. McCook et al., (2010) observe that, in the Great Barrier Reef Marine Park, Australia, enforcement accounts for approximately 30% of the management costs and in India, approximately 60% of the forest department's budget is spent on enforcement (Robinson et al., 2010). It is not surprising, therefore, that over the years, a good many regulatory systems have failed to prevent illegal and harmful business practices, from overfishing by fishers to 'over-lending' by financial institutions, and serious violations are common in virtually all regulatory regimes (Thornton et al., 2009).

In the forestry sector, violations are not lacking particularly in the context of developing countries. It is a trite knowledge that illegal forest activities have contributed to deforestation, forest degradation, economic losses and injustices for forest communities in many developing countries. These violations include illegal forest occupation, illegal logging, evasion of forest related taxes, illegal transport and trade in forest products. Studies that have investigated noncompliance with forest sector regulations in developing countries point to weak law enforcement as a major contributory factor (Contreras-Hermosilla, 2007; Contreras-Hermosilla and Peter, 2005; Kishor and Damania, 2007; Schmidt and McDermott, 2015; Tacconi, 2007). Similarly, some empirical studies in Ghana on what accounts for the persisting violation of logging regulations (i.e., low level of compliance) point to weak enforcement as a critical factor (Boakye, 2015; Hansen, 2011; Marfo, 2010).

However, there is insufficient ground knowledge about what accounts for the weak enforcement. Put differently, there is less scholarly research that has examined what accounts for the weak law enforcement in the Ghanaian forestry sector despite a clear intent to tackle illegal logging on the legislative and (thus) political level. This raises the question of why is legislation not followed up with strong implementation and enforcement actions? This is the focus of this study. First, the study examines how the Forestry Commission conducts its enforcement functions regarding detection of violations and sanctioning of offenders. Specifically, it examines how the frontline regulatory officials (i.e., the street level bureaucrats-Lipsky, 1980) who undertake actual enforcement work at the forest level perceive and carry out their enforcement role. The focus on frontline officials is important because they directly interact with the regulated actors, who are the objects of enforcement action. Again, street level bureaucrats who do not perceive a regulation or policy as meaningful for either themselves personally, the target actors or society at large are less willing to implement it (Lipsky, 1980). However, in the field of regulatory enforcement, few studies have explored the role street-level bureaucrats play (May and Winter, 1999; Nielson, 2006; Seva and Jaggers, 2013). Second, it investigates how these enforcement practices influence compliance behaviour of loggers in Ghana.

This case study about Ghana is significant for two reasons. First, in the Ghanaian forestry sector, very little is known about how various enforcement theories have been applied to understand what shapes weak enforcement. This study, therefore, helps to better understand the sector-specific factors and contributes to the broader enforcement literature, which presently is dominated and shaped by views and experiences from the West, with perspectives from a developing country. Second, experiences and insights (both theoretical and empirical) gained from this study could be shared with other countries where enforcement of logging regulations has had limited to none effect on compliance behavior

The remainder of the manuscript is structured as follows. Section 2 introduces the theoretical framework underpinning the study whereas

section 3 explains how data was sourced and analysed. Section 4 presents the empirical findings. Section 5 discusses the findings in relation to the existing literature and the policy implications.

5.2 Theoretical framework

Central to improving enforcement effectiveness is to understand what influences the compliance behavior of actors subject to regulations. The deterrence theory on compliance behaviour suggests that actors are mostly motivated to obey regulations by fear of legal (state) sanctions, fear of social sanctions and by threat of guilt feeling or shame for doing something which the actor considers morally wrong (Thornton et al., 2009). This means that successful enforcement work is about the deterrence effect or the risk perception regulated actors have about the probability of being caught and the severity of expected sanctions from multiple state and non-state sources (Rooij, 2016). Put differently, effective enforcement work is about the promptness with which violations are detected, severity of sanctions imposed on violators to bring about compliance with regulations (Thornton et al., 2005). For regulatory agencies therefore, enforcement effectiveness largely depends on investment in resources to improve detection probability and sanction severity.

In contrast, the normative compliance theory suggests that regulated actors do obey regulation predominantly because they believe it is morally correct or socially acceptable or because of the legitimacy of institutions that make or implement the regulation (Arias, 2015; Tyler, 1990; Vandenbergh, 2003). Research in the conservation context ranging from Fisheries in Malaysia (Kuperan and Sutinen, 1998) to protected forest areas in Indonesia and Papua New Guinea (McClanhan et al., 2006) supports the value of normative motivations and social pressure to influencing compliance. According to Kuperan and Sutinen (1998), to the extent that this view is valid, enforcement authorities must be fair, and should be able to determine what laws are judged reasonable by segments of the population subject to regulations.

Generally, for successful enforcement work, the role of street level bureaucrats who on daily or regular basis have to interpret and adapt regulations to different contexts is crucial (Lipsky, 1980). Also, Kagan (1994) observes that, enforcement work is endangered when the regulatory agencies are poorly resourced in terms of personnel, logistics and funds. He further notes that, if the inspector-to-site ratio is far lower, it affects frequency of inspection and hence detectability of violations. Studies show that even when sufficient enforcement officials exist, regulatory agencies' having fewer or lacking logistics including transport cannot achieve much enforcement success (Kagan, 1994; McCarthy, 2000). This is mainly because without the requisite logistics violation detection will be problematic and thus undermine enforcement effectiveness. Research demonstrates

that funding plays an important role in enforcement work. Studying the challenges of enforcing a smoke-free workplace regulation in California, Satterlund et al. (2009) reported that counties that received extra funding for enforcement recorded higher detection leading to compliance than their counterparts without extra funding. In some cases, lack of funding has resulted in regulatory capture especially where the agency resort to the very actors they are supposed to regulate for financial or material support (Contreras-Hermosilla, 2001).

Regulatory scholars suggest that regulatory agencies could mitigate the impact of scarce detection resources through collaboration with third party actors (Bardach and Kagan, 1982; Rooij, 2012). According to Bardach and kagan (1982), there could be many kinds of collaboration with state and non-state actors for instance to increase detection or social pressure or even provide alternative livelihood for regulated actors. However, some scholars caution that such collaborations could be risky including potential capture of the enforcement process by third parties who seek to promote their own self-interest and/or that of the regulated actors at the expense of the regulatory agency (Gunningham, 1987; May and Winter, 1999).

Apart from the enforcement work of detecting violations, literature shows that regulatory agencies' capacity to respond to violations through imposition of severe sanctions, together with relatively frequent use of that capacity, is crucial to effective enforcement of regulations (Gray and Scholz, 1991; Thornton et al., 2005). They argue that regulatory effectiveness suffers when violations are infrequently and lightly sanctioned. Studying fishery's regulation in Denmark, Raakjaer-Nielsen and Mathieson (2003) observed that sanction certainty and severity are essential prerequisites for compliance with regulations. Some regulatory scholars point to sanctions certainty and severity as the most important elements in the deterrence logic for enhancing compliance (Paternoster and Simpson, 1983; Sampson and Rorie, 2011). Thornton et al. (2005) have suggested that severe sanctions have both specific and general deterrent effects on violators and the local community respectively. Against this backdrop, May and Winter (1999) warn that law enforcers who are reluctant to invoke sanctions when violations are detected and violators caught will not induce compliance unless there is already a high commitment to comply. Lacking this, sanction is required to alter the decision calculus in favor of compliance. Research has revealed that enforcement work of sanctioning could originate from sources other than the state. Strong social controls from community members and by third party non-state actors and peer-pressures have been shown to affect compliance behavior of regulated actors (Grasmick and Bursick Jr., 1990).

Again, research has shown that effective enforcement is about strong institutions, in the sense of having the legitimacy to ensure deterrence. Tyler (1990) observe that positive opinions about the regulating institution will generate a sense of legitimacy and in turn increase voluntary compliance. A major issue that undermines the legitimacy of most regulating institutions and in turn weakens enforcement effectiveness worldwide is corruption.

Blundo and Olivier de Sardan (2001, 2006) have developed a useful typology of corruption that captures and describes its varied forms in Africa. They include commission for illicit services (i.e., payment by users to officials who then grant access to unwarranted advantages), unwarranted payments for public services (i.e., officials forcing users to pay for services that are ostensibly provided for free, or inflating the cost), gratuities (i.e., kind of payment for services, but usually after the act, and commonly couched in the idiom of "thank you"), string pulling (i.e., using social and political influence to gain unwarranted advantages) and levies and tolls (i.e., payments that officials can extract from ordinary citizens). Efforts to strengthen law enforcement in corrupt contexts often pose a huge dilemma for street level bureaucrats who in most instances are lowly remunerated but have to deal with powerful economic and social actors. The resultant effect has been that they get captured by these actors and are unable to perform their duties effectively (Contreras-Hermosilla, 2001). Corrupt practices can also affect the substantial stringency of regulatory laws and policies as their implementation is affected by bribery and lobbying from powerful actors in corrupt societies (Cerutti et al., 2013; Sundstrom, 2012). Within the forestry sector, Contreras-Hermosilla (2001) observes that corrupt practices allow violators to evade responsibilities for their illegal acts and thus, encourage overexploitation.

Also, available literature on developing countries reveals contextual factors play a crucial role in influencing enforcement effectiveness in the sense that they have direct and/or indirect consequences on what frontline enforcement officials can and cannot do. Examples include insecurity, politics of patronage, nepotism, ineffective state institutions, legal or normative pluralism as well as broader features of socio-political structures indirectly, but strongly, influencing enforcement work (Ascher, 2000; Baldwin, 2016; Rooij, 2006; World Bank, 2012). Some studies including Ascher (2000), indicate that governments sometimes prefer that there is lack of capacity, weak enforcement and ignorance in resource agencies if it can help reduce visibility and accountability. Other research points to limited enforcement autonomy (i.e., freedom of action) for regulatory staff either due to socio-cultural challenges (Oposa, 1996), influence from powerful business entities with political links at various levels of the governance structure or dominant employers at the local levels (Rooij, 2006). Also lack of societal support for enforcement work and issues bordering on legitimacy of regulatory institutions have been documented as challenging effective enforcement in developing countries (Boakye, 2018; Sundstrom, 2012).

5.3 Methods

This study seeks to examine how the Forestry Commission (FC) enforces regulations that prohibit illegal logging with the hope to understand how that influences compliance behaviour of loggers in Ghana. It does so by

drawing on the perspectives and experiences of fifty (50) front line officials directly engaged in enforcing the law against logging actors in the Ashanti Region of Ghana. The two main logging actors of focus here are logging firms who are licensed to undertake legal logging operations and chainsaw operators, who lack the legal locus to engage in logging activities but do so underground, using fuel-powered chainsaw machines to harvest trees and convert them in-situ into lumber. Enforcement is used here to denote the regulatory agency's activities of detecting violations and reacting to such violations through sanctions to bring about compliance with the logging rules.

5.3.1 Selection of study area and respondents

In case studies of this sort, the selected case should represent or elucidate the features of broader population (Seawright and Gerring, 2008). Consequently, this study concentrates on the Ashanti Region (one of the sixteen administrative regions of Ghana) which has the features that make it an ideal place for the study of enforcement of logging regulations. It is the second most forested and important timber production area in Ghana (Affum-Baffoe, 2011). According to TIDD (2011), the capital city of the selected region, Kumasi, houses about 60% of all the logging firms in Ghana, and also boasts of the largest domestic market for timber products, accounting for about 30 percent of total annual supply (Marfo et al., 2017). Finally, the region is strategically located at the centre of the tropical forest zone with a good road network for the distribution of timber products to the southern and northern parts of Ghana and the neighboring Sahelian countries.

The study focuses on the front-line regulatory officials. These are, in a hierarchical order, the District Managers (DM), the Range Supervisors (RS) and the Forest Guards (FG). Their specific enforcement responsibilities are set out in Box 1. There are eight forest districts in the region with a total technical staff population of 293 and the breakdown is as follows; District Managers 8, Range Supervisors 70 and Forest Guards 215. Respondents were selected through stratified random sampling technique. This approach was important to ensure that all the three key subpopulations constituting the frontline regulatory officials are included and their distinct roles captured (Bernard, 2011). For District Managers, 6 out of the 8 were randomly selected whilst 20 out of the 70 Range Supervisors were randomly sampled. Of the 215 Forest Guards, 24 were randomly chosen. The number of forest guards could have been higher but the researcher achieved saturation around the twentieth respondent. In other words, there was no new information after this number. In all cases, deliberate attempt was made to ensure that at least two RSs and two FGs were selected from each forest district. All respondents have had at least five years of enforcement experience. See Table 5.1 for overview of respondents.

Table 5.1 Overview of respondents (N=50)

Staff category	No. of respondents	Mean age	Education level	Average monthly salary (GhC)[1]
District Managers	6	49	BSc (Natural Resource Management)	1,710.00
Range Supervisors	20	49	Post-secondary (Certificate in forestry)	1,240.00
Forest Guards	24	45	Basic or No formal	871.00

Box 1. Logging enforcement responsibilities of different frontline staff

District Managers
A District Manager (DM) heads a forest district, which covers a number of forest reserves. There are presently 46 forest districts that cut across the 216 political/administrative districts of Ghana. They perform the following enforcement duties: supervise all enforcement actions at the district, conduct periodic logging area inspections to promote rule-adherence, determine whether a case goes to the court or is settled administratively and assist the police to investigate and prosecute cases that head to court.

Range Supervisors
They are middle-level frontline personnel who report directly to the DM. They manage a range, which is a sub-division of a forest district. For this study, a range covers up to 80 km^2 and could be a number of forest reserves, a single forest reserve or even part of it. Their duties include the following: monitor and supervise the work of Forest Guards, undertake logging area inspections to certify the legality of trees harvested by loggers and issue documentation to cover them, arrest offenders and assist the Police in investigating and prosecuting cases.

Forest Guards
Forest Guards are the first frontline personnel and the most junior in the technical grade. They take charge of a beat, which is part of a reserve or whole reserve of approximately 10 km in length and report directly to a RS. The entire beat is supposed to be cleaned twice yearly. Their principal duties are to clean and patrol/inspect the boundaries of the reserves in good condition and to detect, arrest and report offences.

5.3.2 Data sources and analysis

The principal data sources are responses from fifty in-depth qualitative interviews and official documents. The primary data was collected through a semi-structured interview technique that uses pre-determined interview guide containing a set of open-ended questions derived from the frame-

1 Ghanaian cedi (GhC) (4.00=1.00 USD) as at 2017

work used and the research objectives (Bernard, 2011). The researcher's knowledge and understanding of the regulatory agency as an enforcement official for over twenty-five years helped in couching very specific main and follow-up questions that drew upon responses by other respondents.

Normally the interviews commenced with preliminary questions that help to establish rapport with respondents and build the kind of trust that allows for frank and open discussion which results in reliable answers to sensitive questions. These questions include respondents' general professional history, educational background, age and challenges about their work. Moving on to how they perform enforcement work of detecting violations, respondents are asked questions on the following; extent of area supervised, frequency of inspections, resources for violation detection, experiences with illegal loggers, who they consider as worse violators and what they think about worse violations. They are also asked how they prioritize enforcement resources, and to estimate the probabilities of detection.

To obtain adequate information on how they react to violation through sanctions, respondents are asked the following questions: how they sanction offenders, what they think about the current levels of sanctions for illegal logging, and challenges they face in sanctioning offenders. The interviews conclude with suggestions for improving enforcement. All the interviews were conducted face-to-face with each lasting averagely 75 min. Respondents are numbered serially from 01 to 50 with prefix "EO", (meaning Enforcement Officer).

This study primarily analyses enforcement performance at the level of frontline officials. The responses from the interviews have been subjected to thematic analysis, which helps to identify, analyse and report patterns or themes within data (Braun and Clarke, 2006). This approach is useful due to its flexibility in describing data in a rich and complex manner. For this study, the themes were based on the research questions and the theoretical framework with which the researcher initially had entered the research field, and those empirical findings that fall outside this framework. This research therefore combines deductive and inductive approaches in the analysis.

5.3.3 Dealing with interview bias

In regulatory research, every data source used (i.e., surveys, interviews, participatory observations or official data) has its own challenges. For qualitative interviews used as the main data collection instrument here, the major challenge is the likelihood of untruthful reporting (Parker and Nielson, 2009). In this particular study where the researcher doubles as regulatory official, the prospect of respondents and/or the researcher bias was high. While it is impossible to completely eliminate interview bias in a study of this nature, the following measures were used to decrease it in many respects. First, respondents were promised anonymity and assured that the purpose of the study was purely academic and not a fault-finding

mission. Second, the researcher obtained prior and informed consent from each respondent. In other words, all respondents participated voluntarily and were guaranteed the freedom to decline response to questions they deemed uncomfortable. Third, the questions asked were very factual and bordered directly on the daily challenges they encounter in their operations. Finally, the face-to-face conversational interviewing approach adopted allowed for further invaluable analyses of the demeanour of respondents aside from their responses.

Actually, some scholars including McKenney et al. (2006) have argued that, being an outsider to a research context helps to promote a greater degree of objectivity which may not be possible for researchers who are insiders. Therefore, to improve objectivity, the researcher adopted the following measures. First, the findings of the study have been widely shared with colleague researchers, practitioners and some of the respondents for critique and feedback to deal with all biases and ethical issues and second, the researcher sought and obtained prior consent and approval from employers to undertake the study. It is also important to mention that, the researcher's insider position came with access to lots of information and contacts with different staff that would have proven difficult for an outsider researcher to secure. These contacts and information proved useful and beneficial throughout the data collection processes. In particular, it helped the researcher to validate or triangulate information obtained from respondents.

5.4 Empirical results

This section presents the empirical findings of the study. First, findings about detection work are presented and second, how officials react to violations through sanctions.

5.4.1 Detecting violations

Although all the frontline officials at the district level work as a team, there are some differences in their detection duties and accordingly the challenges they encounter. Consequently, the findings are presented separately starting from the forest guards to district managers

5.4.1.1 Forest Guards

Forest guards are instrumental in detecting illegal logging through routine ground patrols of forest reserve boundaries and reliance on informants reports or complaints. Traditionally, individual forest guards are supposed to protect 10 km of forest reserve boundary (referred to as a beat), a responsibility that includes cleaning the external boundary with machete to a width of 2m and patrolling to detect, arrest and report violations. However,

in practice most of them protect up to 20 km due to understaffing. Also, they undertake other non-enforcement duties including establishment and/or supervision of forest plantations in both forest reserves and areas outside reserves. Consequently, respondents indicate that in reality they spend about two weeks monthly on beat duties and the rest on other engagements.

Respondents indicate that their major challenges when it comes to detection duties are heavy workload and lack of transport. The study finds out that with the exception of about twenty forest guards who have managed to purchase their own motorbikes for official duties, the rest patrol on foot. This challenge plays out when on daily basis they have to walk long distances to and from work and also when they have to pursue chainsaw operators on foot to effect arrest. As a respondent puts it, *'the chainsaw operators in most instances outrun us and if we are lucky, we only get equipment they leave behind'*. Generally, those with motorbikes perform better in terms of offence detection and arrest when verified from their immediate superior officers. On the other hand, they complain about heavy workload, frequent breakdowns and high maintenance/running cost. The resultant effects of all these are that forest guards are thinly spread out on the ground and frequency of patrols is reduced and that invariably causes detection of violations to suffer. The study finds that the performance of forest guards is not properly monitored. In theory, range supervisors are supposed to follow up on them monthly to supervise the extent of work done but respondents point out it is done quarterly or longer for reasons that are later discussed.

The second strategy is the use of informants to track and detect violations. Respondents explain that there are two main types of informants, professional and voluntary. The professional or paid informants provide information about illegal logging or chainsaw operations for mutually agreed fees whereas the voluntary informants do so for reasons other than monetary. They include aggrieved farmers or persons who have been denied compensation or underpaid for crop or property damage during logging operations, member(s) of a particular chainsaw gang/group who are cheated in the sense of unpaid remuneration due them for assisting in the illegal practice or an employee of a logging firm who feels unfairly treated for any reason. Respondents indicate that because they do not have money, the first category rarely come to them.

Generally, the study finds that forest guards have other challenges that impede their detection work. One is that, violators employ various strategies that help them to avoid detection and arrest. This is particularly the case for most chainsaw operators who enter the forest to work deep in the night and are out by dawn break. They also resort to working on weekends and other statutory holidays when they know forest guards are off-duty and those who work at the day time plant their own informants at vantage points to alert them of any approaching enforcement official (through phone calls or blowing of whistles or firing gun into the air). When transporting the wood product, they use leading vehicles that warn them of routes to avoid to secure safe passage. A second is about how detections and arrests

are treated by their superior officers. Respondents indicate that after they have risked their lives to arrest chainsaw operators, seize their machines and hand them over to their range supervisors, in some cases nothing happens to the culprits and they return to resume operation. A respondent laments, '*it hurts so much when things happened that way particularly with chainsaw operators who brag about their connections with the top hierarchy*'.

A third is interferences especially from the local chiefs and opinion leaders. According to respondents, whenever local chainsaw operators are arrested, they get some of these high-ranking local people to plead for them. It is difficult to "disobey" them and maintain good relations with them at the same time. A respondent shared a case where he was ejected from his rented accommodation because he refused his landlord's request to pardon a chainsaw operator. Nobody offered him accommodation again and he eventually had to leave that village though it was the closet to his beat. Finally, a fourth is low remuneration and corruption. Forest guards are lowly remunerated. Table 1 shows that they receive about 200 USD per month. Respondents admit that they sometimes receive help (as they termed it) from friendly or good loggers. All these challenges help to explain why violation detection has been problematic.

5.4.1.2 Range Supervisors

Range supervisors also play an important role in the detection of illegal logging through logging area inspections, measuring and recording every tree legally harvested by logging firms on a tree information form (TIF). The TIF provides the basis for computing the actual volume of each tree harvested and the stumpage fees payable on it. They also engage in other non-enforcement duties such as supervision of forest plantation establishment. In practice, they visit logging areas and follow logging trails to inspect, measure and record all legally harvested trees. By so doing, they check to ensure that logging firms do not harvest outside their harvesting areas or remove more trees than legally allocated to them. An offence report containing all trees found to have been illegally logged during such inspections is made and submitted to the district manager for the violator to be sanctioned. Additionally, they depend on complaints and reports from informants to track and detect violations particularly in the outside reserved areas. Respondents indicate that monitoring and supervision of their performance is weak as district and regional managers visit not more than twice annually unless they receive reports about serious illegal logging involving for instance ten or more trees in a forest reserve.

The study finds that range supervisors also have difficulties detecting logging violations. As with forest guards, they are under-resourced in terms of personnel, transport and funding but their situation is relatively better than the forest guards particularly in the area of transportation. About a third of range supervisors in the region have been allocated with motor bikes, albeit being more than five years old, for inspections. Another, third

are housed in range quarters put up by the forestry commission. For most range supervisors, these challenges play out when three or more logging firms are working in different locations within their ranges and they have to follow them concurrently to prepare TIF for them. Under such situations, respondents (particularly those without motorbikes) admit they either depend on their forest guards or the bush managers of the logging firms to measure the harvested trees for them. The danger with the first option is that, it takes such forest guards away from their forest reserves boundary patrol duties and thereby allow other violators free access into the reserve. With the second option, there is the high probability of some trees being stolen or under-measured with resultant financial loss to the Commission. Those with motorbikes hint of having to depend on some of the logging firms to "assist" them with fuel before they follow up to capture TIF for them.

For most respondents, another challenge is when they come across infractions by friendly or good logging firms or chainsaw operators who *assist* them or have *assisted* them before both financially and in kind. As a respondent explains '*our salaries are not good and some of these people (loggers) help us in different ways. We gloss over some of their minor infractions say five tree and advised them against any future repetition'*. Some also indicate that they report them for sanctions and that in most cases sever their relationship. The other challenges enumerated by the forest guards including interferences from chiefs, politicians and superior officers, low remuneration and corruption were all repeated by respondents as adversely affecting detection duties.

5.4.1.3 District Managers

District Managers employ three strategies to detect illegal logging. First is through periodic logging area audits in both forest reserves and areas outside forest reserves. Most of them indicate that they visit each logging area at least once annually. During such visits, they check the trees harvested by logging firms against what was allocated to them and any infraction observed is recorded and the violator sanctioned accordingly. Respondents indicate their inability to conduct frequent logging area inspections and that affect their chances of detecting more violations on their own. The main reason given was inadequate resources particularly vehicles and funds for operational work. Most of them have only one vehicle and due to work overload, it breaks down quite often and remains with the mechanics for a long time in the absence of funds. On funding, the study finds that they are allocated quarterly from the headquarters and that each district office receives about GhC 12,000 per quarter (i.e., GhC 4000 per month) to cover administration (including payment of electricity, water and stationery) and operational expenses. As respondent (EO 10) remarked, '*apart from being woefully inadequate, funds are not released on time and for some quarters we receive nothing. Most often by the time we finish paying for utilities there will*

be nothing left for vehicle maintenance and fuel to undertake field inspections. To keep our offices running, we have to use part of the revenue derived from the sale of lumber seized from chainsaw operators albeit being unlawful. For now, this is the only way we can continue to carry on with our mandate'. Having said this, their situation is better than range supervisors and forest guards.

Second, they operate timber task forces to conduct road patrols and spot checks at vantage points to inspect trucks conveying timber products. The timber task force at the district level usually consist of the Assistant District Manager or a Range Supervisor (as leader) and personnel from the military and/or the police as members. The security personnel hold guns and help to effect arrest whenever violators are identified. The timber task forces also respond to reports from forest guards or range supervisors for help to arrest or evacuate chainsaw milled lumber. District Managers enumerate some of the challenges with the timber task forces as follows. First, they particularly focus on road patrols and checkpoints inspections instead of moving into the reserves to flush out the illegal operators. In this case, the harm is caused and only remedial action (i.e., salvaging the wood products) can be taken at that point. Second, the high cost of maintaining the security personnel on the team. Third, alleged corrupt practices; accusations of extortion of money from illegal operators and fronting for them are common. Overall, district managers consider the timber task force as a necessary evil. As one manager puts it '*in one breadth they help us to arrest the illegal operators and, in another breadth, they assist the illegal operators to outwit us*'

Again, the study finds that district managers make effective use of informants. Most managers indicate that they even trust some of the informants to provide accurate reports about illegal operations than their own range supervisors and forest guards. The use of informants also has its attendant problems. Respondents hint that some of them leak information about their intended inspections and movements, once they become aware, to the illegal operators and in so doing frustrate their efforts.

5.4.2 Sanctioning violators

On how violators are sanctioned, the study reveals that offenders either pay administrative fines or are sent to court for sanctioning. The decision as to which one to adopt largely depends on the applicable legal regime and the district managers' discretion. Separate sanction regimes exist for logging firms and chainsaw operators. For logging firms, who engage in illegal logging, the applicable sanction is given under the FC's Logging Manual (LM) (a code of practice for logging firms) as payment of ten times the current stumpage fee for every tree illegally logged and its implementation is done administratively. Based on the current fees/rates (last revised in July 2014), the average stumpage fee for all timber species is about GhC24.00 per cubic metre (Marfo et al., 2017). This translates the prescribed sanction to GhC240.00/m^3 whilst the average domestic market price is about GhC500.00/m^3. The study uncovers that, loggers in most cases are charged

a reduced rate of twice or three times the stumpage fees for reasons that include interferences from influential persons within and outside the industry. Also, since most offence detections are reactive, the trees would have been gone before the fines are imposed and, if not gone already the trees would be restored to the logger once the penalty is paid.

Chainsaw operators are supposed to be prosecuted in court and the applicable sanction regime is stipulated under the Timber Resources Management Regulation (TRMR), 1998 (LI 1649). This regulation prescribes a maximum fine of GhC500.00 or maximum imprisonment of 12 months. Here, it is only a court that can impose this sanction which rarely is the maximum. However, unlike logging firms, the lumber or wood product is not restored to the offender. Notwithstanding this legal position, the study finds that district managers use their discretions to determine whether or not a chainsaw operator arrested is prosecuted in court. One consideration is where the offence took place. Respondents explain that offences in forest reserves are taken more seriously and are usually sent to court. Second consideration is the general comportment of the offender at the time of the arrest. Those who resist arrest or even attempt to harm the enforcement officers (so-called recalcitrant or stubborn violators) are sure bet for court action. Third, first- and second-time offenders are normally given administrative fines whereas frequent or repeated offenders (i.e., three and above) are likely candidates for court. Finally, offenders who intend to use the lumber for non-commercial purposes are likely to be given administrative fine and caution to obtain permit/license in future. Again, violators who have links with the 'powers that be' either within the political, administrative or traditional set up are likely to receive an administrative fine or even go unpunished.

Once a district manager makes a determination to send an offender to court, the case is turned over to the police for investigation and prosecution. During the interviews, it became apparent that most respondents (particularly district managers and range supervisors) have serious challenges with the entire sanctioning regime. They indicated that sanctions given to violators (either by the courts or the regulatory agency) are low and offer little or no deterrence. First, it adversely affects the attitude and morale of enforcement officials. As one respondent states*; 'why should I risk my life to arrest a chainsaw operator at night only for the court to fine him GhC300.00? It would have been foolish death if they had killed me'*. Second, it has the potential to corrupt officials. On this point, this is how respondent (EO 12) remarked, '*with these meagre sanctions given to illegal operators, it would be better for all of us to turn into chainsaw operators. After all, if you cannot beat them, you join them'*. Third, it sends wrong signals to informants who sacrifice to scout and provide information about illegal operations. This is how respondent (EO 15) explains it; '*two of my trusted informants have stopped providing me with information about illegal logging because they think that we treat the illegal operators with kid gloves in the sense that we encourage them, with our low sanctions, to continue with their operations'*.

Another challenge is low prioritization of forest crimes. Respondents hinted that the police investigators and prosecutors together with judges who handle forestry cases lowly prioritize them. There is a widely-held perception that the police investigators/prosecutors and judges underestimate the seriousness of forestry related cases including illegal logging. This sentiment is well articulated by respondent (EO12) as follows; '*we once arrested two illegal operators in a forest reserve and handed them over to the police for investigation and prosecution. We were given different excuses any time we inquired about the status of the case. After about two months, both the investigator and prosecutor handling the case became angry at us and retorted,* 'w*hy do you worry us with prosecution of persons who have only stolen a tree in the forest? Don't you know we have more serious cases such as armed robbery and narcotics to deal with and you come to worry us with timber? You can take your case away if you have no time to wait. It is almost two years now and we are still waiting to hear from them*'. In view of this, officials are reluctant to turn over cases to the police for prosecution.

The third challenge is about interferences from various political, socio-cultural and administrative actors. Regarding political interferences, respondents explained that in most cases the pressure come from the ruling political parties and their supporters at the various levels of governance particularly at the grassroots. The common experience most respondents shared was interferences from the District Chief Executives (DCEs) (who are the political heads at the district levels) and/or the executives of the ruling party at the districts. This is well-illustrated by respondent (EO 18) as follows; '*when we arrest offenders who are party members or related to them, the DCE or any party bigwigs come to plead for them and bail them from sanctions. The case may be with the police for investigation and prosecution but they will pressurize us to withdraw it or they will go and see the police to discontinue with the case'.* On why they have to give in to such requests, this is what the respondent had to say, '*if we refuse, they brand us as difficult persons or members of the opposition political party working against the interest of the ruling government. It is really frustrating because it renders all our efforts useless'*. In this context, the danger of a public official being branded a member of the opposition party could be interpreted to mean such officer is 'unqualified or unfit' for the position as long as the ruling party remains in office. In some instances, such officials are transferred or have had their promotions frozen. Aware of this, some illegal operators now openly declare their support or affiliation with these political parties with the hope of calling on them for support whenever arrested.

In a socio-cultural setting where it is considered disrespectful or a sign of insubordination to decline or challenge an elderly person's or a chief's (particularly paramount chiefs) request, albeit being questionable, enforcement officers are really constrained in dealing with violations involving such personalities or persons related to them. Respondents narrated instances where they have declined requests from chiefs to pardon violators and dearly paid for their actions. Respondent (EO 20) shares this

experience; *'we once arrested two chainsaw operators who were working for a chief without any permit/license. We seized their chainsaw machines and sent them to the district forest office. The next day, the chief sent his linguist (i.e., spokesperson) to request for the release of the two machines to him and discontinue with the case but we declined. The chief got infuriated and reported us to our boss as being disrespectful and does not need us in his jurisdiction. It was not long that the authorities reassigned us to different forest districts'*. For the sake of the officials' own position, and social peace, they must often agree to such requests from chiefs and politicians.

The administrative or internal pressures come from superior officers especially at the regional and national headquarters who for various reasons that include friendship and family affiliations with culprits would plead for them to be freed or treated leniently. Respondents explain that such requests from their superior officers tie their hands and any attempt to decline them is interpreted as a sign of insubordination with serious consequences. As a respondent puts it, '*Our bosses really make work tough for us*' Some respondents indicate that, acceding to such requests from their bosses help to keep or gain favour with them.

The last challenge is the low remuneration given to respondents and how that invariably exposes them to corrupt practices. Table 1 shows that the basic monthly salaries of a DM, RS and FG are approximately 400, 300 and 200 USD respectively. Respondent (EO15) sums up their sentiments as follows; *'we work so hard but receive little salaries at the end of the month, my salary is supposed to take me home (i.e., should be sufficient for the whole month) but the truth is that it cannot take me anywhere near my home (i.e., not more than ten days)'*. The low salaries paid to officials put them in difficult situation whenever illegal operators come flashing money at them to allow them carry on with illegal logging. It is intriguing how officials deal with the issue of poor remuneration. First, some engage in other private businesses (supposedly part-time but can sometimes turn full time and their enforcement work becomes part-time) to supplement their incomes. Second, others receive or accept inducements (gifts or bribes?) from the very actors they are supposed to regulate.

5.5 Discussion and Conclusion

This section first, discusses the empirical findings in relation to existing enforcement literature and second, the policy implications of the findings. Generally, the study finds that enforcement work of detecting illegal logging and reacting to such violations through sanctions to promote compliance with logging regulation is weak. The principal reasons are that, the FC has difficulties detecting violations and even when violators are caught, issues them with non-deterrent sanctions.

The study finds that frontline officials have difficulties detecting violations for reasons that include resource constraints (in terms of personnel,

equipment and funding) and corrupt practices. The issue with understaffing is that, the few enforcement officials are over-burdened with increased workload and that invariably affects detectability of violations (Kagan, 1994). Prior studies in Ghana, including Derkyi (2012), find that, monitoring of the forest reserves boundaries by forest guards as a mean of detecting forest illegalities is inefficient primarily due to chronic understaffing. As in Ghana, research in most other tropical forest-endowed countries reveal that detection work has proven to be difficult due basically to insufficient enforcement officials (FAO, 2005). Research indicates that, even when sufficient enforcement officials exist, fewer or lack of equipment (especially transport) and funds can affect frequency of inspection which is a good proxy for the likelihood of detecting violations (McCarthy, 2000; May and Winter, 1999). The present work confirms these studies and more so, in the particular case of Ghana and other tropical forest countries where forest reserves are scattered in remote areas, transportation is extremely crucial for effective detection.

The findings about inadequate funding and district managers using part of revenue realized from the sale of seized illegal timber products for both administrative and operational expenses are noteworthy as they have serious implications for enforcement work generally. This practice has the potential to breed corruption as funds taking from sale of confiscated lumber, because its unlawful, may not be properly accounted for. The other effect is what Lipsky (1980), describes as goal displacement-a situation where regulatory agencies no longer pursue their primary goals but shift to other peripheral goals that bring them immediate benefits. Here, forest districts (as per the operations of their timber task forces) appear to have shifted from their primary mandate of forest protection and management at the forest floor level to pursuing illegal operators on the highways to arrest them after the harm has been caused so as to get funds to run their offices. In this case, the violation of the logging regulations appears a necessity for the survival or functioning of the regulatory agency than just a menace to be completely eliminated. Some prior research that has investigated environmental pollution in Indonesia (McCarthy and Zen, 2010) and, Latin America and the Caribbean (Tietenberg et al., 1996) conclude that violations persist in situations where fines and penalties from violation form an important part of the regulatory agencies' budget.

Also, the findings about timber task forces and associated corrupt practices are consistent with prior studies in Ghana (Franck and Hansen, 2014; Marfo, 2010). Lessons from other countries where timber task forces have been used including Cameroun, the Philippines and Indonesia suggest that accusations of corrupt practices and ineffectiveness are common (Cerutti et al., 2013; Kishor and Damania, 2007). Again, the use of informants as third-party collaborators to mitigate the adverse impact of inadequate personnel for detection work and its associated challenges find support in other jurisdictions. For instance, studying enforcement of mining pollution regulations in Australia, Gunningham (1987) makes similar observation that

third-party collaborators in enforcement work can sometimes be problematic, especially when they seek to promote their own self-interest and/or that of the regulated actors at the expense of the regulatory agency. All this shows why violation detection has proven a difficult task.

Aside from the detection challenges, the study finds that, both the FC and the courts lack sufficient legal authority to issue strong sanctions. In other words, the fines and penalties under the current legal regimes are palpably low compared with the benefits derived from violation. For regulatory scholars who point to sanctions certainty and severity as the most important elements in the deterrence logic for enhancing compliance (Paternoster and Simpson, 1993; Sampson and Rorie, 2011), this development appears worrisome. Another important finding is that, even when the legal regime allows for higher or stronger sanctions, the regulatory agency is unable to impose them due mainly to interferences from the political through socio-cultural to administrative settings. Under such conditions, the effectiveness of sanctions as a policy intervention to enhance compliance diminishes and noncompliance persists. This finding is consistent with studies reporting that enforcement effectiveness suffers when violators are lightly sanctioned (Gray and Scholz, 1991; Thornton et al., 2005).

Associated with ineffective sanction regime, is the low prioritization of forestry-related cases including illegal logging by the judiciary (i.e., police and judges). This observation finds support in a study conducted by the World Bank in some developing countries including Cambodia, Indonesia and Papua New Guinea that came to similar conclusion. In Cambodia for instance, the study reports that, about 70 percent of forestry and fisheries related cases do not go through the criminal justice system for this very reason (World Bank, 2012).

The findings about various interferences in enforcement work are consistent with existing literature. Earlier studies in Ghana have documented the tacit support from the various political leadership to illegal logging through the acceptance and use of illegal chainsaw lumber for government-funded projects (Boakye, 2018; Marfo, 2010) and their reluctance to assist the FC to enforce the law at the various local timber market centres across the country where the illegal lumber is openly sold (Hansen, 2011). According to Ascher (2000), for reasons that include rent seeking, patronage and evasion of accountability governments in developing countries sometimes prefer there is a lack of capacity or weak enforcement. In this study also, the socio-cultural contexts were found to exhibit traits that potentially undermine enforcement effectiveness. This confirms research about environmental pollution control in the Philippines indicating that socio-cultural context can hinder enforcement work (Oposa, 1996). Again, the findings about administrative interferences agree with existing literature. For instance, Cooney (2007) reports that enforcement of labour regulations in China is weak due to administrative interferences. All this indicates that, interferences from both the external and internal regulatory contexts have strong impact on enforcement effectiveness

Moreover, the study finds that the low remuneration given to frontline officials adversely impact on their performance. Evidence from various studies including fisheries (Catedrilla et al, 2012) and forestry (Contreras-Hermosilla, 2001) support this finding. Finally, the findings about corrupt practices, as variously described by Blundo and Olivier de Sardan (2001, 2006) within the regulatory context, resonate with some earlier studies in Ghana including (Ameyaw et al, 2016; Marfo, 2010; Obiri and Damnyag, 2011). Lessons from the forestry sector in Cameroon, Indonesia and Papua New Guinea (Cerutti et al., 2013; Contreras-Hermosilla, 2001) and, the fisheries sector in the Philippines (Catedrilla et al (2012) and South Africa (Sundstrom, 2016) indicate that corruption can interfere with successful detection and sanctioning of illegal operators. Studying corruption and conservation rule violation in the fisheries sector in South Africa, Sundstrom (2016) demonstrates a strong correlation between corrupt inspectors and violations of conservation rules by fishers.

Implications of findings

The present study about law enforcement in the logging sector of Ghana provides some useful insights for the broader enforcement literature and practice. First, the study finds that the problem of enforcement of logging regulations in Ghana is much more about the low chances of offenders being caught for violating the regulation due to the weak state regulatory agency's proactive detection capacity. For scholars who believe that detection probability is the key driver of compliance in the deterrence logic, a weak detection probability could mean the risk associated with violation is low (Cohen, 2000; Grasmick and Bursik Jr., 1990). Such a perception has the tendency to stimulate widespread violation as actors are no longer deterred due to the reduced detection risk. A policy suggestion here is to adopt measures that enhance violation detection including aerial patrols and reconnaissance surveys using drones and other modern technologies to support existing ground patrols. Another approach to improve detection would be for the state to elicit the support of the forest fringed communities and forest land owners through education and increased benefits flow from the forests to them.

Second, is the revelation that the current sanctioning regimes are ineffectual and offer very little incentive for actors to comply with the law. Existing regulatory literature teaches that compliance is not just about sanctions severity by the state enforcement authorities as much of deterrence theory espouses. Compliance can also emanate from other sources including legitimacy of legal rules, social pressures and personal norms (Sutinen and Kuperan, 1999; Vandenbergh, 2003). However, research shows that for rational actors' significant improvement in compliance is unlikely without strong regulatory pressures (Thornton et al., 2009). In other words, for rational economic actors, strong enforcement in the sense of certainty and severity of sanctions from the state is vital for improved compliance.

A policy recommendation here for regulators' desiring to enhance compliance among rational economic actors like loggers, is to implement sanction regimes that invoke significant fear that override the violation effect of low sanctions. Also, market instruments such as certification and other licensing schemes that help to trace the legality of timber products from the forest floor to the final consumer could be leveraged to promote compliance. In this regard, it is envisaged that the full implementation of the licensing scheme under the EU-Ghana voluntary partnership agreement would potentially promote compliance, at least, among the actors that export to the EU market.

Third insight is that, the deterrent effect of the state to improve compliance performance among the loggers is low. In theory, this could be mitigated through deterrence from other non-state sources (Grasmick and Bursik Jr., 1990; Rooij, 2016). In this regard, a strong network of both local and international actors (including the media and civil society groups) playing an oversight role would be desirable. Such a framework, according to Gunningham (2011) helps to achieve not only better outcomes at less cost but also frees up scarce [state] regulatory resources, which can be redeployed in circumstances where only direct government intervention is available.

Fourth, the finding that the judiciary (police and judges) lowly prioritise forestry-related crimes could mean a general lack of appreciation and understanding about the real value of forest resource conservation in the wider society. After all, when the value of a resource is unknown abuse or low prioritization is inevitable. In this regard, the regulatory agency would have to specifically target them for continuous education about the importance of the forest and impress upon them to impose heavy fines and custodial sentences to serve as signal cases. Scholarship demonstrates that signal cases have the potential to create a broader environment of fear among the regulated actors and thereby help to reduce noncompliance behaviour (Thornton et al., 2005).

Another issue is corrupt practices within the regulatory agency. The normative compliance theory suggests that people tend to obey laws made and/or implemented by authorities and institutions perceived to be legitimate. Generally, corrupt practices undermine the legitimacy of a regulatory agency and its work. Consequently, unless some drastic measures are taken to address this canker any increases in enforcement resources may not necessarily translate to performance effectiveness. A recommendation to tackle this canker and to improve legitimacy could be for the state to ensure that there is a real risk of sanction certainty for both loggers who give and officials who receive. The sanctions should include naming and shaming those who engage in corrupt practices and the confiscation of the proceeds of their crimes. Fifth, the low remuneration given to frontline officials has been shown to adversely impact on enforcement work. After all, there is no need to muzzle the ox that grinds the grains. A recommendation here is enhancement in their working conditions including insurance against injuries and death.

A final insight is the existence of various interferences that undermine enforcement effort. Put differently, in the particular case of Ghana and possibly in other developing countries, the socio-politico-cultural and administrative settings of regulatory officials matter for effective enforcement and hence the compliance behaviour of regulated actors. All this adds a new dimension to our understanding of what is driving weak enforcement of logging regulations, at least in Ghana, beyond poor state regulatory institutions' proactive detection capacity and low sanction severity. Here, more research work is required to understand how to improve regulatory enforcement within the peculiar socio-politico-cultural and administrative context of Ghana and other developing countries where similar challenges exist.

6 Conclusion

6.1 Introduction

Ghana's attempts at sustainable forest management have a long history dating back to 1909 with the establishment of the then Forestry Department (FD) and creation of 1.8 million ha permanent forest estates nationwide. The Department (now Forestry Commission, pursuant to Act 571, 1999) was mandated, among other things, to sustainably manage, protect, develop and regulate the forest resources to provide vital ecosystem services and functions for the well-being of millions of forest dependent dwellers and those beyond, well into the future. Since then, various policy and legal instruments have been enacted, implemented and enforced to ensure the sustenance of the forests. However, the last few decades have witnessed appreciable levels of human-induced forest cover loss and degradation from different drivers including illegal logging.

There are two main logging actors in Ghana. These are the licensed logging firms and unlicensed chainsaw operators. First, the licensed logging firms are privately owned business entities registered under the laws of Ghana to undertake timber harvesting and/or processing of logs to semi-finished and finished timber products. They have been in existence since the 1880s and can be categorised into large, medium and small-scale operators based on their production output and the number of people employed (see 3.3). The majority of the firms is Ghanaian-owned but the large-scale firms are predominately foreign-owned. In terms of trade outlets, they export to every continent in the world with the bulk of their products being traded in Asia/Far East, Africa and Europe (TIDD, 2015). Annually, they contribute about USD 300 million in foreign exchange (from exports of about 0.5 million m^3 of mainly secondary processed wood products) and directly employ about 100 000 persons and indirectly provide livelihood support to about two million people (GoG, 2012). It is important to indicate that all licensed logging firms are expected to be in compliance with the timber harvesting regulations always. However, the reality is that they comply to some extent and violate to another extent. A detailed account of the licensed logging firms and their compliance performance is given in chapter 3.

Second, the chainsaw operators are another important actors in the timber industry. They consist of individuals and groups who have no license or legal locus to engage in timber harvesting business but do so underground and harvest even more volume than the licensed logging firms (Hansen and Treue, 2008; Marfo, 2010). They use fuel-powered chainsaw machines

to illegally harvest trees and convert them in-situ to lumber for commercial purposes (a banned practice under the Timber Resources Management Regulations (TRMR, 1998)). This means that all chainsaw operators by definition operate in violation of the law. Nonetheless, they continue to operate virtually in every forest area and employ an estimated 97,000 persons along the entire production and marketing chain (Marfo and Acheampong, 2011). In terms of trade, chainsaw lumber accounts for about 1.1 million m^3 (i.e., 72% of the annual national production) of lumber traded on the domestic market valued at GhC 544.39 million based on the average market price of GhC 494.00/m^3 for all species (Marfo et al, 2017). Though to a relatively smaller extent, some of the illegal products are offloaded directly within the Economic Community of West African States (ECOWAS) sub-regional market, others are mixed up with legal products and traded on the international market. Chapter 4 gives further account of the chainsaw operators.

Why illegal logging persists in Ghana and what measures are required to address the menace have been subjects of great concern to many stakeholders in Ghana and beyond. This book on regulatory compliance in the logging sector in Ghana, has attempted to understand how and why the key logging actors in Ghana's timber industry (i.e., licensed logging firms and chainsaw operators) respond to regulations in the sector and the extent to which the Forestry Commission, the main state regulatory institution, enforces these regulations to ensure compliance. In so doing, it addressed the following three research questions:

i. What influences loggers in Ghana (i.e., licensed logging firms and chainsaw operators) in their decisions to comply with or violate logging regulations?
ii. How do enforcement practices of the Forestry Commission contribute to compliance-violation behaviour of loggers in Ghana?
iii. What are the broader theoretical and empirical implications from this study for forest regulation, compliance and enforcement in Ghana and other developing countries?

Research questions 1 and 2 are addressed in chapters 3 to 5 whereas question 3 is answered in this concluding chapter.

The remainder of the chapter is structured as follows. Section 2 presents the findings of the first two research questions. The section that follows attempts to situate the findings of the study in a broader perspective, beyond the context of Ghana. Section 4 highlights the significance of contextual factors to understanding low compliance performance in Ghana and other developing countries. Section 5 examines the broader theoretical and empirical implications of the study (thus answering research question 3) and section 6 reflects on the methodological approaches used. The final section looks at future research beyond the scope of this study.

6.2 Findings and answers to the research questions

This subsection presents the conclusions from the findings of the research questions set out in this study.

6.2.1 Research question 1: What influences loggers in Ghana in their decisions to comply with or violate logging regulations?

This research question sought to generally understand what influences the compliance-violation behaviour of the two key logging actors (licensed logging firms and chainsaw operators) in Ghana. Due to differences in the legal status and mode of operations of the two key actors, the findings for this research question are separately presented. First, the licensed logging firms and second, the chainsaw operators.

Licensed logging firms

The study found that economic, social and normative motivations have both positive and negative influence on compliance performance of all the three categories of licensed logging firms in Ghana. Economic motivations were important determinants of compliance among logging firms. For economic motivations, the study investigated both the basic deterrence, which focuses on perceived risks of detection and sanction severity, and the perceived operational costs-benefits of legal and illegal behaviour. The perceived risk of detection by the state regulatory institution was found to be low. Also, sanctions from the state for illegal logging, particularly the stumpage fee-indexed penalty provided under the logging manual, were found to be low and created a huge financial incentive for firms to violate the logging regulation. Alternatively, the study found that deterrence from third party non-state actors (including forest certification bodies) produced better compliance than the state. It was also found that the firm's market destination influenced their compliance performance. Firms who exported to the EU market complied better than their colleagues who exported to markets in Asia and Africa. Also, firms with positive cost-benefit ratio for legal operations complied better than those with negative cost-benefit ratio.

Regarding social motivations, the study revealed that social pressure was very important in shaping the violation behaviour of logging firms in various ways. First, firms had a high perception of violation among their colleagues and this perception influenced them to do likewise. Second, firms knew that chainsaw operators were harvesting trees illegally. For most licensed firms, this is, perhaps, the single most important factor that drives them to violation. Third, pressures from the local communities within which the firms operated for infrastructural and monetary supports pushed them to violate the rules to be able to meet those demands. The study found no evidence that there was pressure on the firms from either the local community members or the timber trade association to comply.

However, the study recorded few firms whose compliance decisions were motivated primarily by the desire to maintain a good corporate image or reputational capital.

On normative motivations and how they influenced firms' compliance-violation performance, the study considered the actors' felt sense of duty to comply (morality), perceived reasonableness of the law and the perceived legitimacy of the regulatory agency. The study found that all the three domains had more influence on the firms' violation behaviour than compliance. For most firms, decisions to comply with or not were purely an economic one and not about morality. However, there were few firms who considered morality, particularly the hope in eternal life, more crucial than any economic consideration in deciding whether to comply or not. The study found that most of the firms perceived the existing rules on logging that restricted the number of trees they could harvest from a production forest to three per hectare as unreasonable and manifested their disapproval through violation. Finally, the inability of the regulatory agency to vigorously enforce the ban on chainsaw operation presented a huge challenge for it to enforce the rule on illegal logging against licensed logging firms. The firms considered it unfair for the regulators to tighten the screw on them while chainsaw operators continue to operate with impunity. The end result was the declining legitimacy of the regulatory agency with its possible manifestation in low compliance performance.

The overall finding on compliance variation among different categories of firms shows that, small-scale firms comply better than medium and large-scale firms. On economic motivations, the small-scale firms' compliance performance was better than the medium and large-scale firms due to their higher perception of sanctions and weak financial capacity. The small-scale firms also recorded a higher compliance performance with social motivations than the medium and large-scale firms. The main reason here appears to be the low community demands on them for various forms of assistance including infrastructural and monetary supports. Again, the small-scale firms performed better on normative motivations than their counterparts. Their felt sense of duty to comply with the regulation and perceived reasonableness of the rule were much better than the medium and large-scale firms.

Chainsaw Operators

The chainsaw operators may best be described as 'invisible logging actors' and their study provided valuable insights into the motivations of actors who offend the basic premise of logging regulations in Ghana. In other words, they operate without any legal locus, thus pure illegality. The findings, to a large extent, are consistent with regulatory studies that have underscored the importance of low deterrence, social support for criminal activity, corrupt institutions and contextual factors in shaping violation

behaviour among regulated actors. The study found that perceived low sanction severity and financial gains to be derived from illegal operations were the major drivers of the violation behaviour among chainsaw operators. The current sanctions were perceived as low and unlikely to deter violators from engaging in illegal practices. Apart from that, there were influential persons at the various levels of governance who in most instances jumped to their defence to bail them out completely or have the sanctions mitigated for reasons that included economic, social and political considerations. Under such conditions, the use of threat of sanctions as a policy instrument to elicit compliance pales out and the violation persists (Cohen, 2000).

On social motivations, the study found strong social acceptance/support for the violation behaviour due to many reasons. First, there was (and still is) a high demand and patronage of chainsaw milling lumber on the domestic market. It is readily available and cheaper than lumber from the licensed logging firms. This confirms research that has shown that violation or criminal activities persist as long as the goods and services provided by them are in great demand by the populace (Passas, 2002). Second, it helped to create jobs for the youth in and around the local community where they operated. This includes carrier boys, who assist in conveying the processed lumber from the stump site to the road side and load the lumber onto trucks which transport them to various marketing centres and vendors, and those who re-saw the lumber to the specifications required by the various customers. One study has estimated that about 97,000 people are employed across the entire chainsaw production and marketing chain (Marfo and Acheampong, 2011). This suggests that the violation of the law is not only related to the (economic) interests of the chainsaw operators but also thousands of others who depend on the illegal operation for their livelihoods. Third, chainsaw operators support infrastructural developments such as school buildings, clinics and bridge construction in the local communities they operate in the form of lumber and money. The study did not record any social sanctions and pressures from the local communities within which the chainsaw operators operated.

Regarding normative motivations, the study focused on actors' standards of personal morality, perception of reasonableness of the law that bans chainsaw milling and legitimacy of the regulatory agency. On personal morality, the study reveals that violation appears normal and does not produce any shame or guilt-feeling among chainsaw operators. For them, chainsaw milling is about livelihood and survival and has nothing to do with morality. In other words, the 'violating behaviour' appears to be good for one's social and economic development and does not appear as breaking the rules on timber harvesting. Another finding was that, actors were dissatisfied with the law that made chainsaw operations illegal because it tended to strain their livelihood and survival needs. The violation behaviour of the actors could therefore emanate from principled disagreement with law (Tyler, 1990). Again, the study showed that the legitimacy of the

regulatory agency may have been compromised from the view point of the chainsaw operators since they are, in most instances, met with demands for informal payments (bribes) when arrested. The widely-held perception among them is that some FC officials take bribes to facilitate their illegal operations. It should be noted that, once actors recognise they can evade or minimise detection and/or sanctions by informal payments to regulatory institution; the legitimacy of such an institution is greatly diminished. In other words, corruption tag on regulatory institution lowers its legitimacy before its actors and thereby motivate those actors to violate the regulation.

Finally, the study points to some contextual factors that played a critical role in shaping noncompliance behaviour among the regulated actors. They included poverty and political issues. The chainsaw operators who are actually involved in logging at the forest level lived on less than a dollar per day without chainsaw income but moves to about two dollars when combined with proceeds from chainsaw milling. Whichever way one looks at it, chainsaw operators may be described as very poor. For these people therefore, chainsaw operation is used either to supplement their income or is their main source of income. It may be said then that for these actors the violation of the regulation is not about unwillingness to comply but inability to do so (Huisman, 2001). Perhaps, indications of a favourable political context for the widespread violation are the use of chainsaw lumber for some government-funded projects in the country and the lack of political will by authorities to enforce the law at the market places across the country where the illegal lumber products are openly sold. These could create a perception in the minds of the actors about the political support for their illicit operations and thereby incentivise them to persist in such illicit practice.

6.2.2 Research question 2: How do enforcement practices of the Forestry Commission contribute to compliance-violation behavior of loggers in Ghana?

The enforcement practices of the FC regarding detection of violations and responding to such violations through sanctions to promote compliance with logging regulations formed the subject matter of chapter 5. Generally, the study highlights the reasons why enforcement has had limited impact on the compliance performance of both logging firms and chainsaw operators.

Three categories of frontline officials are directly engaged in the enforcement of logging regulations in Ghana: forest guards, range supervisors and district managers. Forest Guards are the first frontline personnel at the forest level and their main task is to protect forest reserve boundaries, a responsibility that includes cleaning with machete and patrolling to detect and arrest violators. Range Supervisors are middle-level frontline personnel who supervise the forest guards. Additionally, they conduct logging areas inspection to ensure that only legally allocated trees are logged. District Managers head the frontline enforcement personnel and their primary task

is to coordinate all enforcement activities within a forest district. Details of the enforcement responsibilities of the three frontline personnel are captured in chapter 5.

The study finds that officials have had difficulties detecting violations for various reasons. The first was inadequate resources in terms of personnel, transport and funding. These have resulted in increased workload, reduced frequency of inspections and decreased detection probability. It was determined that forest guards were the hardest hit by these resource constraints followed by range supervisors and finally, district managers. Second, the violators employed various strategies that enabled them to minimise detection. They included working deep in the night, weekends and other statutory public holidays, planting their own informants at vantage points to alert them of any approaching enforcement official (through phone calls). Also, when transporting the wood product, use leading vehicles that warn them of routes to avoid to secure safe passage.

The study reveals that, to help improve detection, each forest district operates a timber task force consisting of the Assistant District Manager or a Range Supervisor (as leader) and personnel from the Military and/or the Police as members. The timber task forces mainly patrol highways and does spot checks at vantage points to inspect trucks conveying timber products. They also respond to reports from forest guards or range supervisors for help to arrest violators or evacuate chainsaw milled lumber. However, the operations of the task forces come with some challenges. First, they particularly focus on road patrols and checkpoints inspections instead of moving into the reserves to flush out the illegal operators. In such cases, the harm is caused and only remedial action (i.e., salvaging the wood products) can be carried out at that point. Second, the high cost of maintaining the security personnel on the team. Third, alleged corrupt practices including accusations of extortion of money from illegal operators and fronting for them are common.

Aside from the frontline officials proactive detection work, they also depend on reports and complaints from informants, both paid and voluntary, to track and detect violations (so-called reactive detection). The paid informants are individuals and groups who provide information about illegal logging for a fee whereas the voluntary ones do so for reasons other than monetary considerations. Though very useful and beneficial, the use of informants has its attendant problems including extortion of moneys and leakage of information about intended inspections and movements by enforcement officials, once they become aware, to the illegal operators and thereby frustrate their efforts.

On how violators are dealt with, the study found that the existing legal regimes prescribe two types of sanctions namely, administrative fines and court-determined fines and penalties. Another finding was that, under the existing legal regimes both the FC and the courts lack sufficient authority to issue strong sanctions. In other words, the fines and penalties under the current legal regimes are palpably low compared with the benefits derived

from violation. The study also reveals that, even when the legal regime allowed for higher or stronger sanctions, the FC was unable to impose them due mainly to interferences from the political through socio-cultural to administrative settings. Again, it was determined that the FC preferred issuing administrative fines to prosecuting cases in court for reasons that included the low prioritization of logging cases by the judiciary. Finally, the study noted that the low remuneration paid to frontline officials and corrupt practices within the regulatory context substantially interfered with successful detection and sanctioning of illegal operators.

6.3 Reflections on the findings of the study in broader perspectives

It is imperative to state that this study does not claim statistical representativeness for any of the actors investigated (i.e., logging firms, chainsaw operators and forestry enforcement officials), due largely to the small sample sizes used. Nonetheless, when the findings of this research are compared with other studies from Ghana and elsewhere, they reveal some common trends and differences that have relevance for compliance-violation studies generally.

6.3.1 Compliance-violation behaviour of logging firms

On compliance-violation behaviour of logging firms, this study generally confirms most of the findings from prior research (in Ghana and other developing countries) that economic, social and normative motivations shape compliance and violation behaviour. However, there are some important differences from this study. The existing research has lumped all logging firms together as one unit and does not look at variations in compliance-violation performance across different categories of firms as done in this study. Second, for economic motivations, previous research primarily focused on the deterrence logic (i.e., the probability of being caught and sanctioned for violation) at the neglect of operational cost-benefit analysis of legal and illegal operations. This study captures the operational cost-benefit analysis as well. Third, unlike earlier studies that considered deterrence as sanctions solely originating from the state, this study considered other sources including those from third party non-state actors particularly the EU market actors and private international regulatory bodies like the Forest Stewardship Council in influencing compliance behaviour. Last, earlier studies mostly focused on how financial gains have influenced violation but not the impact of high cost of legal operations/compliance and the violation effect of chainsaw operations

The study also reveals some insights that are not found in prior research. First, it uncovered how some firms had to violate the law in order to satisfy pressures from the local communities for developmental assistance. The firms explained that the pressure on them from the forest fringe communi-

ties through the District Assemblies to the traditional authorities for various assistance including maintenance of roads, construction of school buildings and money for celebration of festivals were unbearable. They explained that these informal payments were substantial and huge drain on their finances and push them to engage in illegal logging. Second, the study shows how the importance of maintenance of good reputational capital influences firms' compliance behaviour and third, how for some regulated actors, their religious beliefs including hope in eternal life positively impact on compliance performance.

In the developed world context, the findings of this study generally fit into the economic, social and normative motivations posited by existing western regulatory literature to shape compliance-violation behaviour of regulated actors. There are, however, some variations when Ghana is compared to the western world. First, though this study confirms the importance of deterrence from different sources and actors on compliance behaviour, in the case of the West such deterrence has been shown to primarily originate from their own state and internal non-state actors/institutions and not that of external/foreign actors as was the case in this study. Second, whereas this study found that social pressures largely undermine compliance behaviour, the reverse is the case for most compliance studies from the developed countries. Third, the influence of normative motivations on compliance behaviour was found to be less pronounced in this study than compared to the developed countries. However, the influence of regulated actors' religion (i.e., hope in eternal life) on compliance found in this study was quite revealing but appears not to have received much attention in western literature. Fourth, this study and those from the West agree on the role of corruption and its adverse impact on compliance generally. Nonetheless, it appears from existing literature that state regulatory institutions in the developed economies are relatively less corrupt and are therefore able to better promote compliance than found in this study. Finally, on compliance variation among different categories of firms, the general finding of this study tends to support the strand of literature that argues that small-scale firms comply better than large-scale firms. The large-scale firms were found to use their status in the economy to evade compliance.

6.3.2 Violation behaviour of chainsaw operators

The findings that deterrence, social, normative motivations and contextual factors were largely responsible for illegal logging by chainsaw operators exist in prior research that had investigated chainsaw operations in Ghana and other developing countries. Specifically, the findings that chainsaw operations are largely poverty-driven or motivated by financial considerations, attract low sanctions when violators are caught, have wider societal acceptance in the sense that it provides livelihood support to the local inhabitants, support local infrastructural development, account for the bulk of timber products (mainly lumber) consumed locally and do not attract

sanctions from the community or group members resonate well with earlier studies in Ghana and other developing nations. Again, findings concerning the regulated actors' perception about the unreasonableness of the law prohibiting chainsaw operations and corrupt practices among the regulatory officials equally find support in prior research.

Nevertheless, there are some noteworthy differences and lessons from this study. First, this study adopted a socio-legal approach to understand why and how chainsaw operations persist and the motivations of the actors involved. It thus, went beyond just the nature, extent and distribution or marketing of chainsaw lumber products, which have dominated the existing literature that considers chainsaw operations in Ghana and other developing economies. Second, flowing from the above, most of the existing studies on chainsaw operations are not well-embedded in regulatory compliance-violation literature that seeks to explain the motivation, and influencing factors behind actors' violation or deviant behaviour. Third, an important insight from this study is that the actors involved do not see the violating behaviour as a moral issue but as a vital necessity for their social and economic development. In other words, to these actors' illegal logging, even if it is wrong, is an essential requisite for their livelihood and survival. It thus suggests that for these actors unless adequate alternative and sustainable livelihoods options are made available, voluntary compliance is unlikely to emanate from them any time soon.

Notwithstanding the fact that illegal logging is a worldwide problem, for now, it thus appears from existing literature that the use of chainsaws for commercial production of lumber or timber products is largely limited to developing tropical forest countries. However according to one study illegal logging in the US is mostly undertaken by individuals-private lumber producers and small-scale firms (Sheikh, 2008), thus suggesting the possibility of existence of chainsaw-like operations as pertained in the developing world context.

6.3.3 Law enforcement

The findings about the FC's weak proactive detection capacity due to resource challenges in terms of personnel, equipment (particularly transport) and funding are consistent with prior research in Ghana and elsewhere. Research indicates that even in developed countries, enforcement is only capable of detecting a small fraction of infringements (Stern, 2008). Similarly, the determination that violators employ various strategies to evade detection finds support in existing studies in Ghana and other jurisdictions concluding that illegal logging occurs outside the purview of most citizens and sometimes literally under the cloak of darkness (Cerutti et al., 2013; Marfo, 2010). Also, the findings concerning the operations of timber task forces and associated corrupt practices are consistent with prior studies in Ghana. Experiences from other developing countries such as the Philippines and Indonesia where timber task forces have been used sug-

gest that accusations of corrupt practices and ineffectiveness are common (Cerutti et al., 2013; Kishor and Damania, 2007). Furthermore, the findings about the use of informants as a reactive detection strategy to mitigate the adverse impact of inadequate personnel for detection work and its associated benefits and challenges find support in earlier research in Ghana and other jurisdictions (Franc and Hansen, 2016).

On sanctions, the finding that both the FC and the courts lack sufficient legal authority to issue strong sanction, as well as issuing sanctions far below the prescribed maximum, even when it is within their authority, is consistent with existing research in Ghana (Boakye, 2018). Empirical evidence from other developing countries agrees with the present study that both administrative fines and court-determined sanctions issued to violators of logging regulations are low and non-deterrent (Eberhardt, 2013; World Bank, 2012). Again, the findings concerning various interferences ranging from political through socio-cultural to administrative undermining enforcement work are consistent with existing literature in Ghana and elsewhere (Ascher, 2000; Baldwin, 2016). There is ample evidence from existing literature to show that support from the political, socio-cultural and administrative settings is absolutely critical for effective enforcement work in every jurisdiction. (Kagan, 2004; Satterlund et al., 2009). Moreover, the finding that the low remuneration package for frontline officials adversely impact their enforcement performance is consistent with evidence from various studies in Ghana and elsewhere (Contreras-Hermosilla, 2007; World Bank, 2012). Finally, the findings about corrupt practices within the regulatory context hampering successful detection and sanctioning of illegal operators resonate with some earlier studies in Ghana and other jurisdictions (Cerutti et al., 2013; Kishor and Damania, 2007).

There are two noteworthy differences between the findings of this study and what pertains in the West. First, whilst this study found deterrence-based approach as the predominant enforcement strategy, most western studies have documented cooperative or responsive regulation as the preferred choice. Second, there is stronger media and civil society oversight within the regulatory context in the West than pertains in Ghana and other developing countries

6.4 Significance of contextual factors to understanding noncompliance behaviour in Ghana and other developing countries

The findings of this study confirm existing research that illegal logging is more prevalent in developing economies than in the developed world. So, what factors account for this variation or how do we explain the variations in compliance performance levels between the developed and developing economies? Many factors could account for this but the analysis of the contextual information gathered from this study provides some useful

insights in this regard. The findings suggest that variations in compliance performance could be largely explained from contextual perspectives. The contexts, as used here, denote the economic, social, political and regulatory settings of the regulated actors, and how they influence their compliance-violation decision making processes.

The economic context, in the sense of the micro and macro economy of the regulatory actors, plays a crucial role in explaining the violation behaviour in Ghana. In spite of Ghana's lower middle-income status and as one of the fastest growing economies in the world, poverty levels, particularly among, the rural population are still high. The chainsaw study reveals that most of the actors engaged in it live on between one and two dollar(s) a day. Whichever way one looks at it, these people can be described as poor and, in the absence of viable alternative livelihood options, have resorted to chainsaw operations. Also, there are some local people whose primary income source depends on their continued employment by these chainsaw operators and/or logging firms who undertake illegal logging. Again, the high demand for illegal timber products both on the local and export markets makes illegal logging lucrative business.

Moreover, in an attempt to accelerate economic development in Ghana and most developing economies, governments have tacitly accepted some levels of illegal logging or abuses in the natural resources sector so as to achieve the desired economic transformation. In most developing tropical forest dependent countries timber from the natural forests is seen as a major driving force for socio-economic transformation. As Khan and McDonald (1995) observed, every new government needs to generate its own funds to run the State machinery and for developmental projects, and timber being a readily exploitable natural resource with high demands both locally and on the international market then becomes the obvious target. This assertion largely describes the situation in Ghana where, until recently, timber was the third most important foreign exchange earner. It is now the fourth foreign exchange earner for Ghana. The economic context also leads to low salaries for those who work in the public sector, for example with the Forestry Commission; it makes them more susceptible to corrupt practices.

The social contexts of the regulated actors have a lot to teach us about why violation behaviour persists in Ghana. Social context as used here encompasses social structures and institutions at the local, regional and national levels. First, there are those local traditional and community leaders who support illegal logging so that the violators can assist them with basic infrastructural projects like construction of chief's palace, schools, borehole water and roads. Second, the chainsaw study found that some communities condoned violation behaviour by charging the violators a fixed amount of money they must pay to the community leaders either for every truck load of illegal lumber transported or trees harvested. Similarly, the logging firms study uncovered that pressure from some communities for infrastructural development forces them to violate the law. Third, the illegal timber products have high acceptance on the domestic market (partly

because they are relatively cheaper and easily available). It appears the whole nation has come to accept chainsaw lumber as normal and therefore to patronise it. Finally, the findings from this study suggest that violation behaviour attracts no social sanctions from family members or the community at large. This means there is apparent lack of peer or societal pressure to compel them to comply.

Regarding the political context, this study found that some instances of violations have been either openly or tacitly supported by local, district and regional political leadership. In the logging firms' study, a finding showed that governments appear reluctant to impose severe sanctions on violating large scale firms due mainly to their contribution to the socio-economic development of the country including job creation and foreign exchange remittances they bring into the country. Also, in the chainsaw study, the following key findings were made about political leadership support. First, some political authorities at the different levels of governance step in to bail out violators whenever they are caught. Second, the use of chainsaw lumber for government-funded projects has created a perception in the minds of the violators about governmental support for their illegal operations and has thereby incentivised them to persist in such illicit practice. Third, governments appear reluctant to enforce the ban on chainsaw operations at the various domestic lumber markets across the country where the impact obviously would have been higher. Though feasible, such an intervention could be politically costly in terms of future elections.

The regulatory contexts also help to explain the violation behaviour of both logging firms and chainsaw operators. First, sanctions for violation prescribed under the law are low and therefore have incentivized actors to break the law. This study has shown that actors, particularly the chainsaw operators, perceived the regulations that ban their operations as unfair, unreasonable and not feasible as it attempts to deny them their basic survival and livelihood needs. The logging firms on the other hand perceive the rules as harsh because of the low number of legal trees they could harvest and thus making legal operations financially prohibitive and unattractive.

Related to the regulatory contexts are enforcement actions. The study found that law enforcement has contributed little to compliance behaviour. There is limited state capacity (in terms of personnel, transport and funds) resulting in detection difficulties. Logging violations are lowly prioritized by the police and the judiciary. Regulatory officials have less freedom of action due to interferences from the socio-politico-cultural and administrative settings. Local government and communities' support have been low. There are also instances where corrupt law enforcement officials including forestry and police have suppressed or undermined strict law enforcement for various considerations of personal gain.

All these situations and circumstances show why illegal logging is accommodated in Ghana and *mutatis mutandis* in other developing countries albeit being against national and international laws and in spite of

its many adverse consequences. In summary, whilst 'perfect compliance' with logging regulations, not sure if it even exists anywhere in the world, is highly desirable, the present social, political, economic, institutional, and regulatory conditions prevailing in Ghana and most developing tropical forest countries do not make it feasible and practicable.

6.5 Implications of findings for theory and practice

The findings from this study have some implications for compliance and enforcement studies. For the logging firms' study, it was determined that economic considerations, rather than social influences and normative motivations, were the most important factors shaping actors' compliance-violation performance. For such regulated actors, voluntary compliance is unlikely unless they are subject to regulatory regimes that induce significant fear of punishment for noncompliance (Thornton et al., 2009). The present study supports this theory which is central in compliance scholarship. In other words, in the absence of strong social pressures and/or normative motivations, rational or profit-oriented regulated actors such as logging firms, require rules that counter the violation effect of low sanctions. A policy insight for Ghana and countries desiring to enhance compliance under such situation must be to impose higher sanctions that make violation unattractive.

Another finding from the logging firms' study was that, those firms who exported into the EU market and/or engaged in forest certification processes recorded a better compliance performance. Here, the study showed that, it is the informal sanctions from these non-state actors that compel those firms to better comply and not the sanctions from the state regulator. A theoretical insight from this finding is that deterrence, in the sense of fear of legal sanctions, social pressures and moral duty to comply, can originate from sources other than just the state and its sanctions (Grasmick and Bursik Jr., 1990; Rooij, 2016). In this study about logging firms in Ghana, such deterrence has been shown to emanate from the EU market actors and private international forest certification bodies. The policy implication here is for the state regulatory agency to re-examine the current regulatory design that has the state policy and law as the sole instrument category in favour of one that uses different instruments implemented by a number of non-state parties, commercial and NGOs. Such a framework, according to Gunningham (2011) helps to achieve not only better outcomes at less cost but also frees up scarce state regulatory resources, which can be redeployed in circumstances where only direct government intervention is available. In this respect, a network of both local and international actors would be desirable.

Also, the logging firms study revealed some firms, though small, who would not engage in illegal logging for reasons different from sanctions from the state such as maintaining good reputation or status in their community, religious beliefs, hope in eternal life, and the need to protect the

forest for posterity. This finding also demonstrates that compliance is possible even with limited to no deterrence from the state. This suggests that regulators can enhance compliance through non deterrent and inexpensive means including the use of simple messages or adverts that encourage actors that compliance is good and the right thing to do.

The chainsaw operators study highlighted the significance of contextual factors in shaping violation behaviour. It appears from the study that the socio-economic context of the regulated actors is crucial in driving violation behaviour. The violators have no or little formal education, mostly unemployed with no sustainable livelihood and living at the fringes of the forests they perceive as their food basket. Under such conditions of high cost of compliance, any enforcement, policy or regulatory action that fails to address their precarious economic situation is likely to achieve little success. In this respect, a way forward is for regulators to work out a more flexible, accommodative policy that seeks to balance forest resource conservation with human well-being, particularly for the rural forest dwellers (McShane et al., 2011; World Bank, 2009). This may be done in several ways. One way would be to review the existing legal framework on tree tenure in Ghana that vests all naturally occurring timber trees on farm and fallow lands in the President to allow farmers and landowners who nurture such trees to own them. This is likely to give the farmers and landowners enough motivation to protect them. Another approach would be for the regulator to actively engage the forest fringe communities and landowners in joint or co-management of the forests and equitably share the benefits that accrue with them. Such an arrangement could create a management responsibility and/or moral obligation on the part of the landowners and fringe communities to report violators and thereby help not only to induce compliance, but also to foster sustainable management of the resource.

The use of chainsaw lumber for government-funded projects had directly or indirectly created a perception among the violators of governmental or political support for their noncompliance behaviour. Already the Ministry of Lands and Natural Resources has since 2015 developed and placed before the cabinet a domestic lumber procurement policy document that requires all firms working on government-funded projects to source their lumber from a certified legal source. An immediate approval and strict implementation of the policy by the government will demonstrate, in no small measure, to the violators the highest political disapproval of the practice.

The study indicates that the Forestry Commission has a weak proactive detection capacity. For scholars who believe that detection probability is the key driver of compliance in the deterrence logic, a weak detection probability could mean that the risk associated with violation is low (Cohen, 2000; Grasmick and Bursik Jr., 1990). Such a perception has the tendency to stimulate widespread violation as actors are no longer deterred due to the reduced detection risk. A policy suggestion here would be for the state regulator to support the existing ground patrols with aerial patrols and reconnaissance surveys using drones and other modern technologies.

Another important finding is the low prioritisation of forestry-related crimes by the judiciary including the police and judges. This could suggest a general lack of appreciation and understanding about the real value of forest resource conservation in the wider society. After all, when the value of a resource is unknown, abuse or low prioritization is inevitable. In this regard, the regulatory agency would have to target them and the society generally for continuous education and awareness creation about the value of the forest so as to elicit their support and cooperation in its protection and management. Understanding that forest crimes are not just trivial wrongs against a non-entity but about undercutting our own sustainability and existence on this planet is important. The various forest certification bodies and international environmental-oriented NGOs could also assist in this regard because sustainable forest management and trade are global issues that require support from all quarters

This study also documents the importance of cooperation with third party actors in enforcement duties. The existing cooperation with the forest fringe communities, land owners and farmers could be further improved through enforcement partitioning. In this case the state/regulatory agency should completely devolve ownership and management of the forest resources in the outside reserved areas to individual farmers and/or local chiefs who own them. This will free the regulatory agency to concentrate its limited resources on the forest reserves only. Also, such an arrangement will give direct financial benefits to the farmers and/or chiefs concerned and thereby incentivise them to better protect these trees/forests.

An important issue which came forward in this study is the existence of corrupt practices within the regulatory agency. Some theorists have documented in various sectors including forestry that corrupt practices pose serious threats to compliance and enforcement actions (Cerutti et al., 2013; Kishor and Damania, 2007). This study confirms this theory and thus helps to explain how and why regulated actors are able to easily violate the law. It could be added that, unless the problem of corruption is dealt with, even sufficient resources may not necessarily result in enforcement effectiveness. A recommendation to tackle this cancer and to improve legitimacy could be for the state to ensure that there is a real risk of sanction certainty for both loggers who give and officials who accept. The sanctions should include naming and shaming those who engage in corrupt practices and the confiscation of the proceeds of their crimes.

6.6 Methodological reflections

This study has used a mixed research methods approach to understand what influences loggers in Ghana in their decisions to comply with or violate logging regulations and how enforcement practices of the Forestry Commission influence the compliance behaviour of these loggers. First, the study investigated compliance-violation from the perspectives of the

regulated actors whose behaviour the law seeks to regulate. This approach is important because it is the way they perceive the regulation that influences their compliance behaviour (Gray and Silby, 2011). Second, it adopted the qualitative semi-structured interview technique instead of the direct survey type approach. The approach followed was necessary as it gave the researcher the opportunity to ask follow up questions and extract from respondents comprehensive accounts of choices they have to make in their daily work. In this study, such in-depth accounts were generally more illuminating of how the actors decide to comply or break the logging regulations and the challenges they face, which form the primary object of this study, than direct survey-type questions probably would have revealed.

In what follows, the researcher reflects on his dual role as a researcher and an employee of the Forestry Commission. The researcher's personal experience of having worked with the regulatory institution for over twenty-five years now in various capacities had both positive and negative influence on the study. The researcher joined the then Forestry Department in 1992 as an Assistant Conservator of Forests at the then School of Forestry, Sunyani, and later as a District Forest Manager, then as an Assistant Regional Manager, then moving to become Operations Manager for the Forest Services Division (Headquarters, Accra), then a Regional Manager and presently as Director, Forestry Commission Training Centre. These varied experiences at the different levels of the regulatory institution have brought with them an in-depth knowledge and understanding of both the working processes of the institution and the various actors it regulates. These positions within the FC provide access to lot of information and contacts with different stakeholders that would have proven difficult for an outsider researcher to secure. These contacts and information proved useful and beneficial throughout the data collection processes. In particular, it helped the researcher to validate or triangulate information obtained from respondents.

An example here will suffice. In an interview with a managing director of a logging firm, a question was asked whether they always harvest only the legal trees allocated to them, and if not, the number of times they have harvested more trees than were allocated to them within the last two years? Prior to this interview and unknown to the managing director, the researcher had obtained data from the district forest manager for the areas where the firm operates about the number of violations recorded against the firm. The response from the managing director was that they always harvest only the legal trees allocated to them. When confronted with the data obtained from the district forest manager, there was no denial and that opened the door for 'further and better particulars' on why firms harvest more trees than the regulators allocate to them. These explanations were more revealing of the firms' practices.

The other advantage was that respondents thought the researcher knew everything already and that encouraged them to freely and openly discuss without any inhibition whatever they knew about the subject matter of the interviews. Such a perception invariably helped to minimise any incentive

to be untruthful in their responses. Similarly, for most respondents, it was an opportunity for them to put their concerns and frustrations about the regulatory agency with someone who could help them find a solution. This also allowed respondents to openly and freely discuss and exchange views on various topics which formed the subject matter of the research. Certainly, these advantages would not have inured to researchers unfamiliar with the Ghanaian forestry terrain. They would have been regarded as outsiders and the key actors in the study would have been hesitant to deal with them. In other words, such researchers are unlikely to receive the kind of reception and open discussion afforded to me. As an insider, the researcher had a thorough understanding of the study context and could relate well with the actors.

It should also be pointed out that the researcher's position as a regulatory officer carried with it some challenges as well. There were ethical and potential conflict of interest issues. A major challenge was the perception some of the regulated actors had that the researcher was coming to create problems for them; just coming to learn about their secrets and use against them in future. It was really difficult to persuade some of them that the regulatory officer they know very well is now wearing a different cap as a researcher. As a result, some potential respondents refused to cooperate for the fear of self-incrimination. For others, it was concerns about revealing or sharing firms' trade secrets that could be leaked to their competitors. The researcher observed that firms/individuals who wanted to sound polite in refusing to be interviewed flashed the card of tight working schedule due to urgent contracts they had to satisfy.

McKenney et al., (2006) have argued that, being an outsider to a research context helps to promote a greater degree of objectivity which may not be possible for researchers who are insiders. Therefore, to improve objectivity and to deal with the challenges enumerated above, the following measures were adopted. First, the researcher assured respondents of anonymity and confidentiality of any sensitive information shared. Consequently, no firm or individual who participated in the study is identified by real name. There are also no trails for them to be easily identified and singled out for sanctions. Second, the researcher obtained prior and informed consent from each respondent. In other words, all respondents participated voluntarily and were guaranteed the freedom to decline response to questions they deemed uncomfortable. Third, findings of the study have been widely shared with colleagues, both researchers and practitioners, and some respondents for critique and feedback to deal with all ethical issues. Finally, findings of the study are published in peer-reviewed journals where editors and reviewers have had the opportunity to comment and provide feedback to deal with ethical issues and minimise biases.

A major limitation of this study is that it does not claim any statistical representativeness for the various actors studied, logging firms, chainsaw operators and forestry enforcement officials, due to the small sample sizes used. Though the small sample size may weaken the external validity of

certain findings, it allowed enough time to extract from respondents comprehensive accounts of choices they have to make in their daily work. These in-depth accounts were generally more illuminating of the various factors that influence their decisions and performances, which form the primary object of this study.

6.7 Future research directions

The results of this study have opened up other areas about illegal logging, law compliance and enforcement that require investigations in future.

i. Enhancing compliance is quite a complex phenomenon and not just a straight forward calculation of increasing sanctions to achieve a higher level of compliance as deterrence theory would like us to believe. More than that, and as has been shown in the present study, compliance has other dimensions as well including social and moral or personal influences. What is important then for policymakers and practitioners to enhance compliance among various regulated actors is to understand how such actors respond to different compliance motivations either functioning independently or in their combination. Here much research is still needed.

ii. The present study has demonstrated the significance of contextual factors particularly the socio-politico-economic and institutional settings to understanding noncompliance behaviour in Ghana besides the three main motivations documented in most of the western compliance literature. Much more research is required to ascertain how these contextual factors either directly or indirectly operate to undermine efforts to improve compliance and what proactive measures are required to address them.

iii. As has been highlighted in the chainsaw study, compliance is not primarily a process that is driven by legal rules and/or enforcement action by regulatory authorities but can also be driven by capacity to comply, perceived reasonableness of the rule, of the legitimacy of the regulatory agencies, and of local socio-political pressures. This is particularly in cases where a deterrence strategy is unlikely to be feasible due to persistent violation and limited enforcement capacity. Here policymakers and practitioners need to understand and know what approaches are cost-effective and feasible to get such actors come into compliance.

iv. Another area of interest for future research will be how to create a smarter mix, or strengthen the existing mix, of public and private governance; and of national and transnational governance structures/networks to tackle the problem of illegal timber harvesting and trade.

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Summary

Ghana's attempts at sustainable forest management have a long history dating back to 1909 with the establishment of the then Forestry Department (FD), now Forestry Commission, to sustainably manage, protect, develop and regulate the forest resources to provide vital ecosystem services and functions for the well-being of millions of forest dependent dwellers and those beyond, well into the future. Since then, various policy and legal instruments have been enacted, implemented and enforced to ensure the sustenance of the forests. However, the last few decades have witnessed appreciable levels of human-induced deforestation and forest degradation from different drivers including illegal logging.

In Ghana, illegal logging and associated illicit trade are a challenge with diverse negative environmental, social and economic consequences. There are two main logging actors in Ghana namely, the licensed logging firms and chainsaw operators. The licensed logging firms are privately owned business entities registered under the laws of Ghana to undertake harvesting and/or processing of logs to semi-finished and finished timber products. They have been in existence since the 1880s and can be categorised into large, medium and small-scale operators based on their production output and the number of people employed. The bulk of their timber products is traded on the export market. It is important to indicate that all licensed logging firms are expected to be in compliance always. However, the reality is that they comply to some extent and violate to another extent.

The chainsaw operators are other important actors in the timber industry and may best be described as 'invincible logging actors'. They consist of individuals and groups who have no licence or legal locus to engage in timber harvesting business but do so underground. In other words, their operations offend the basic premise of logging regulations in Ghana. They use fuel-powered chainsaw machines to illegally harvest trees and convert them in-situ to lumber for commercial purposes (a banned practice under the Timber Resources Management Regulations (TRMR, 1998). This means that all chainsaw operators by definition operate in violation of the law. In terms of trade, chainsaw lumber is mostly sold on the domestic market. Though to a relatively smaller extent, some of the illegal products are offloaded directly within the Economic Community of West African States (ECOWAS) sub-regional market, others are mixed up with legal products and traded on the international market.

Why illegal logging persists in Ghana and what measures are required to address the menace have been subjects of great concern to many stake-

holders in Ghana and beyond. This book on regulatory compliance in the logging sector in Ghana, has attempted to understand how and why the key logging actors in the Ghana's timber industry respond to regulations in the sector and the extent to which the Forestry Commission, the main state regulatory institution, enforces these regulations to ensure compliance. This book addresses three main research questions. First, what influences loggers in Ghana (i.e., licensed logging firms and chainsaw operators) in their decisions to comply with or violate logging regulations? Second, how do enforcement practices of the Forestry Commission contribute to compliance-violation behaviour of loggers in Ghana and third, what are the broader theoretical and empirical implications from this study for forest regulation, compliance and enforcement?

This book contains six chapters: chapter one provides the introduction, chapter two reports on the extent of illegal logging and thus provides a background to the study. Chapters 3, 4 and 5 present results, discussions and recommendations of the main research questions and the last chapter, a conclusion on the main findings and insights, and their implications for forestry regulation, compliance and enforcement.

Chapter 3 investigates what influences the compliance-violation behavior of licensed logging firms. The study found that economic, social and normative motivations have both positive and negative influence on compliance performance of all the three categories of licensed logging firms in Ghana. Economic motivations were important determinants of compliance among logging firms. For economic motivations, the study investigated both the basic deterrence, which focuses on perceived risks of detection and sanction severity, and the perceived operational costs-benefits of legal and illegal behaviour. The perceived risk of detection by the state regulatory institution was found to be low. Also, sanctions from the state for illegal logging were found to be low and created a huge financial incentive for firms to violate the logging regulation. Alternatively, the study found that deterrence from third party non-state actors (including forest certification bodies) produced better compliance than the state. It was also found that the firm's market destination influenced their compliance performance. Firms who exported to the EU market complied better than their colleagues who exported to markets in Asia and Africa. Also, firms with positive cost-benefit ratio for legal operations complied better than those with negative cost-benefit ratio.

Regarding social motivations, the study found that social pressure was very important in shaping the violation behaviour of logging firms in various ways. First, firms had a high perception of violation among their colleagues and this perception influenced them to do likewise. Second, firms knew that chainsaw operators were harvesting trees illegally. For most licensed firms, this is, perhaps, the single most important factor that drives them to violation. Third, pressures from the local communities within which the firms operated for infrastructural and monetary supports pushed them to violate the rules to be able to meet those demands. Actually, the

study found no evidence that there was pressure on the firms from either the local community members or the timber trade association to comply. However, the study recorded few firms whose compliance decisions were influenced primarily by the desire to maintain a good corporate image or reputational capital.

On normative motivations and how they influenced firms' compliance-violation performance, the study considered the actors' felt sense of duty to comply (morality), perceived reasonableness of the law and the perceived legitimacy of the regulatory agency. The study found that all the three domains had more influence on the firms' violation behaviour than compliance. For most firms, decisions to comply or not were purely an economic one and not about morality. However, there were few firms who considered morality particularly the hope in eternal life more crucial than any economic consideration in deciding whether to comply or not. The study showed that most of the firms perceived the existing rules on logging that restricted the number of trees they could harvest from a production forest to three per hectare as unreasonable and manifested their disapproval through violation. Finally, the inability of the regulatory agency to vigorously enforce the ban on chainsaw operation presented a huge challenge for it to enforce the rule on illegal logging against licensed logging firms. The firms considered it unfair for the regulators to tighten the screw on them while chainsaw operators continue to operate with impunity. The end result was the declining legitimacy of the regulatory agency with its possible manifestation in low compliance performance.

Chapter 4 seeks to understand the motivations for violating timber harvesting regulations among chainsaw operators, who also are important actors in the forest sector. The chainsaw study provides valuable insights into the motivations of actors who offend the basic premise of logging regulations in Ghana. In other words, they operate without any legal locus, thus pure illegality. The findings underscored the importance of low deterrence, social support for criminal activity, perceived corrupt institutions and contextual factors in shaping violation behaviour among regulated actors. The study found that perceived low sanction severity and financial gains to be derived from illegal operations were the major drivers of the violation behaviour among chainsaw operators. The current sanctions were perceived as low and unlikely to deter violators from engaging in illegal practices. Apart from that, there were influential persons at the various levels of governance who in most instances jumped to their defence to bail them out completely or have the sanctions mitigated for reasons that included economic, social and political considerations. Under such conditions, the use of threat of sanctions as a policy instrument to elicit compliance pales out and the violation persists.

On social motivations, the study found strong social acceptance/support for the violation behaviour due to many reasons. First, there was (and still is) a high demand and patronage of chainsaw milling lumber on the domestic market. It is readily available and cheaper than lumber from the

licensed logging firms. Second, it helped to create jobs for the youth in and around the local community where they operated. In other words, there are many people who depend on the illegal operation for their livelihoods. Third, chainsaw operators support infrastructural developments such as school buildings, clinics and bridge construction in the local communities they operate in the form of lumber and money. The study did not record any social sanctions and pressures from the local communities within which the chainsaw operators operated.

Regarding normative motivations, the study focused on actors' standards of personal morality, perception of reasonableness of the law that bans chainsaw milling and legitimacy of the regulatory agency. On personal morality, the study reveals that violation appears normal and does not produce any shame or guilt-feeling among chainsaw operators. For them, chainsaw milling is about livelihood and survival and has nothing to do with morality. Another finding was that, actors were dissatisfied with the law that made chainsaw operations illegal because it tended to strain their livelihood and survival needs. Again, the study showed that the legitimacy of the regulatory agency may have been compromised from the view point of the chainsaw operators since they are in most instances met with demands for informal payments (bribes) when arrested. Finally, the study points to some contextual factors including poverty and political issues as playing a critical role in shaping noncompliance behaviour among the regulated actors.

Chapter 5 examines how the FC's enforcement practices regarding detection of violations and responding to such violations through sanctions help to promote compliance or violation with logging regulations. The study identified three categories of frontline officials who are directly engaged in the enforcement of logging regulations in Ghana: forest guards, range supervisors and district managers. Forest Guards are the first frontline personnel at the forest level and their main task is to protect forest reserve boundaries, a responsibility that includes cleaning with machete and patrolling to detect and arrest violators. Range Supervisors are middle-level frontline personnel who supervise the forest guards. Additionally, they conduct logging areas inspection to ensure that only legally allocated trees are logged. District Managers head the frontline enforcement personnel and their primary task is to coordinate all enforcement activities within a forest district.

The study finds that officials have had difficulties detecting violations for various reasons. The first was inadequate resources in terms of personnel, transport and funding. These have resulted in increased workload, reduced frequency of inspections and decreased detection probability. It was determined that forest guards were the hardest hit by these resource constraints followed by range supervisors and finally, district managers. Second, the violators employed various strategies that enabled them to minimize detection. They included working deep in the night, weekends and other statutory public holidays. Also, when transporting the wood

product, use leading vehicles that warn them of routes to avoid to secure safe passage.

The study reveals that, to help improve detection, each forest district operates a timber task force consisting of the Assistant District Manager or a Range Supervisor (as leader) and personnel from the Military and/or the Police as members. The timber task forces mainly patrol highways and does spot checks at vantage points to inspect trucks conveying timber products. They also respond to reports from forest guards or range supervisors for help to arrest violators or evacuate chainsaw milled lumber. However, the operations of the task forces come with some challenges. First, they particularly focus on road patrols and checkpoints inspections instead of moving into the reserves to flush out the illegal operators. Second, the high cost of maintaining the security personnel on the team. Third, alleged corrupt practices; accusations of extortion of money from illegal operators and fronting for them are common.

Aside from the frontline officials proactive detection work, they also depend on reports and complaints from informants, both paid and voluntary, to track and detect violations (so-called reactive detection). The paid informants are individuals and groups who provide information about illegal logging for a fee whereas the voluntary ones do so for reasons other than monetary considerations. Though very useful and beneficial, the use of informants has its attendant problems including extortion of moneys and leakage of information about intended inspections and movements by enforcement officials, once they become aware, to the illegal operators and thereby frustrate their efforts.

On how violators are dealt with, the study found that the existing legal regimes prescribe two types of sanctions namely, administrative fines and court-determined fines and penalties. Another finding was that, under the existing legal regimes both the FC and the courts lack sufficient authority to issue strong sanctions. In other words, the fines and penalties under the current legal regimes are palpably low compared with the benefits derived from violation. The study also reveals that, even when the legal regime allowed for higher or stronger sanctions, the FC was unable to impose them due mainly to interferences from the political through socio-cultural to administrative settings. Again, it was determined that the FC preferred issuing administrative fines to prosecuting cases in court for reasons that included the low prioritization of logging cases by the judiciary. Finally, the study noted that the low remuneration paid to frontline officials and corrupt practices within the regulatory context substantially interfered with successful detection and sanctioning of illegal operators.

The study recommends that enhancing detection through aerial patrols and reconnaissance surveys using drones and other modern technologies, a real risk of sanction certainty and severity for loggers and officials caught in corrupt practices and a strong network of local and international actors including the media and civil society groups playing an oversight role would be desirable to improve enforcement effectiveness

Chapter 6 concludes with the main findings and insights, and their implications for theory and for forestry regulation, compliance and enforcement. Generally, this study has contributed to our understanding of what influences compliance-violation behavior in the developing world context. First, the study finds that, at their present levels, sanctions from the state for illegal logging are low and create a huge incentive for loggers to violate the logging regulation. It should be understood that for rational or profit-oriented regulated actors, rules that provide higher financial rewards/benefits than sanctions [when violated] are more likely to be honoured in violation than in compliance. A policy insight for Ghana and countries that desire to enhance compliance under such situation must be to implement measures that counter the violation effect of low sanctions. Actually, this suggestion is the basic assumption underlying deterrent-based compliance. Thus, a higher sanction severity increases compliance and vice versa.

Second, the study finds that, those firms who exported into the EU market and/or engaged in forest certification processes recorded a better compliance performance. Here, the study showed that, it is the informal sanctions from these non-state actors that compel those firms to better comply and not the sanctions from the state regulator. A theoretical insight from this finding is that deterrence, in the sense of fear of sanctions can originate from sources other than just the state (Grasmick and Bursik Jr., 1990; Rooij, 2016). The policy implication here is for the state regulatory agency to re-examine the current regulatory design that has the state policy and law as the sole instrument category in favour of one that uses different instruments implemented by a number of non-state parties, commercial and NGOs. Such a framework, helps to achieve not only better outcomes at less cost but also frees up scarce state regulatory resources, which can be redeployed in circumstances where only direct government intervention is available (Gunningham, 2011). In this respect, a network of both local and international actors would be desirable.

Third, the study finds some firms, though small, that would not engage in illegal logging for reasons aside from deterrence such as religious beliefs (i.e., hope in eternal life) and the need to protect the forest for posterity. This is an important finding and demonstrates that compliance is possible with limited to no deterrence from the state or society. This suggests that regulators can enhance compliance through non-deterrent and inexpensive means including the use of simple messages or adverts that encourages actors that compliance is good and the right thing to do. Another insight is the significance of contextual factors to understanding non-compliance behavior of logging actors in Ghana. In other words, the socio-economic-politico-cultural contexts of the country exhibit traits that undermine compliance and enforcement efforts.

All these demonstrate that enhancing compliance is complex phenomenon and not just a straight forward calculation of increasing sanctions to achieve a higher level of compliance, as deterrence theory would like us to assume. More than that, compliance has other dimensions as well including

social, normative and political. What is important then for policymakers and practitioners to enhance compliance among various regulated actors is to understand how different actors respond to different compliance motivations under various socio-politico-economic and cultural settings. Here, much research is still required to ascertain how these factors either functioning independently or in their combination shape compliance behaviour in regulated actors. Another area of interest for future research will be how to create a smarter mix, or strengthen the existing mix, of public and private governance; and of national and transnational governance structures/networks to tackle the problem of illegal timber harvesting and trade.

Samenvatting (Summary in Dutch)

Inzicht in illegale houtkap in Ghana. Een rechtssociologisch onderzoek naar naleving en overtreding van de regelgeving voor de houtkap

De pogingen van Ghana om tot duurzaam bosbeheer te komen hebben een lange geschiedenis die teruggaat tot het begin van de vorige eeuw met de oprichting van het toenmalige 'Forestry Department' (FD) – tegenwoordig 'Forestry Commission' (FC). Deze dienst heeft tot taak de bossen duurzaam te beheren, te beschermen, te ontwikkelen en te reguleren om hiermee voor de lange termijn essentiële ecosysteemdiensten te verschaffen voor het welzijn van miljoenen bewoners die direct en indirect afhankelijk zijn van het bos. Sindsdien zijn er verschillende beleids- en juridische instrumenten vastgesteld, geïmplementeerd en gehandhaafd om het onderhoud van de bossen te waarborgen. In de laatste decennia hebben wij echter aanzienlijke ontbossing door menselijk ingrijpen kunnen waarnemen, en aantasting van de bossen door verschillende oorzaken, waaronder illegale houtkap.

In Ghana vormen de illegale houtkap en de daarmee samenhangende illegale handel een probleem met uiteenlopende negatieve consequenties voor milieu, maatschappij, en economie. Er zijn twee belangrijke actoren op het gebied van houtkap in Ghana, namelijk de houtkapbedrijven met een vergunning en de 'chainsaw operators' (in Ghana wordt de term 'chainsaw operator' – hierna 'kettingzager' – gebruikt om te verwijzen naar een houtkapper die zonder vergunning met een kettingzaag bomen kapt). De houtkapbedrijven met vergunning zijn particuliere ondernemingen die conform de Ghanese wetgeving zijn geregistreerd en bomen mogen kappen en/of verwerken tot halffabricaten en eindproducten. Deze bedrijven bestaan al sinds 1880 en kunnen worden ingedeeld in grote, middelgrote en kleine ondernemingen op basis van hun productie en het aantal werknemers dat zij in dienst hebben. Het grootste deel van hun productie is bestemd voor de export. Van houtkapbedrijven met een vergunning wordt verwacht dat zij zich te allen tijde aan de regels houden. De realiteit is echter dat zij zich tot op zekere hoogte aan de regels houden maar voor een ander deel de regels overtreden.

De 'kettingzagers' zijn de andere belangrijke actoren in de houtindustrie, en men kan ze omschrijven als 'onverslaanbaar'. Het zijn individuen en groepen die geen vergunning hebben noch een legale locatie om zich bezig te houden met houtkap, maar dit desalniettemin toch illegaal doen. Hun activiteiten zijn dus in strijd met het basisprincipe van de regelgeving inzake houtkap in Ghana. Zij gebruiken gemotoriseerde kettingzaagmachines om illegaal bomen te kappen en deze ter plekke te verwerken tot hout voor de handel (een verboden praktijk volgens de 'Timber Resources Management Regulations' (TRMR, 1998)). Dit betekent dat alle kettingzagers per definitie

in strijd met de wet werken. Het hout dat zij kappen wordt voor het grootste deel op de binnenlandse markt verkocht. In mindere mate worden sommige van de illegale producten rechtstreeks afgezet op de sub-regionale markt van de Economische Gemeenschap van West-Afrikaanse Staten (ECOWAS), terwijl andere worden vermengd met legale producten en verhandeld op de internationale markt.

Waarom illegale houtkap in Ghana zo hardnekkig blijft bestaan en welke maatregelen getroffen zouden moeten worden om het te bestrijden, zijn onderwerpen van grote zorg voor veel belanghebbenden in Ghana en daarbuiten. In dit proefschrift, dat de naleving van de regelgeving in de bos- en houtsector in Ghana onderzoekt, wordt getracht te begrijpen hoe en waarom de belangrijkste actoren in de houtindustrie in Ghana reageren op de regelgeving in de sector en in hoeverre de Forestry Commission, de belangrijkste regelgevende instantie van de staat, deze regelgeving handhaaft om de naleving ervan te waarborgen. In dit proefschrift zijn de drie hoofdvragen van onderzoek alsvolgt. Ten eerste: Welke factoren beïnvloeden actoren in de houtkap in Ghana (d.w.z. de erkende houtkapbedrijven en de illegale kettingzagers) in hun beslissingen om de regelgeving inzake houtkap na te leven of te overtreden? Ten tweede: Hoe draagt de handhavingspraktijk van de Forestry Commission bij aan het nalevings- of overtredingsgedrag van de houtkappers in Ghana? en ten derde: Wat zijn de bredere theoretische en empirische implicaties van dit onderzoek voor de regulering, naleving en handhaving in de bosbouw?

Dit boek omvat zes hoofdstukken: Hoofdstuk 1 is een inleidend hoofdstuk, hoofdstuk 2 beschrijft de omvang van de illegale houtkap en biedt daarmee een achtergrond voor deze studie. In antwoord op de drie hoofdvragen worden in de hoofdstukken 3, 4 en 5 de resultaten, de analyses en aanbevelingen uitgewerkt. In hoofdstuk 6, de conclusie, worden de belangrijkste bevindingen en inzichten gepresenteerd en de implicaties hiervan voor de regelgeving, naleving en handhaving in de bosbouw.

In hoofdstuk 3 wordt onderzocht welke factoren van invloed zijn op het nalevings- of overtredingsgedrag van houtkapbedrijven met een vergunning. Uit het onderzoek is gebleken dat economische, sociale en normatieve motieven zowel positieve als negatieve invloeden uitoefenen op het nalevingsgedrag van alle drie de categorieën van houtkapbedrijven met een vergunning in Ghana. Economische motieven waren belangrijke bepalende factoren voor naleving door houtkapbedrijven. Met betrekking tot de economische motieven werd in dit onderzoek gekeken naar de primaire afschrikking die zich richtte op de vermeende risico's van ontdekking en de zwaarte van de sancties, en de ingeschatte kosten en baten van legaal en illegaal gedrag. Het ingeschatte risico van ontdekking door de regelgevende overheidsinstelling bleek laag te zijn. De sancties door de staat voor illegale houtkap bleken ook laag te zijn en dit creëerde een enorme financiële prikkel voor bedrijven om de regelgeving met betrekking tot houtkap te overtreden. Opmerkelijk was dat uit het onderzoek naar voren kwam dat afschrikking door derde partijen, anders dan de staat (met inbe-

grip van instanties die zich bezighouden met certificering in de bosbouw) een betere naleving van de regels oplevert dan afschrikking door de staat. Ook bleek dat de marktbestemming van het bedrijf van invloed was op het nalevingsgedrag. Bedrijven die exporteerden naar EU-markten hielden zich beter aan de regels dan hun collega's die exporteerden naar markten in Azië en Afrika. Ook bedrijven met een positieve kosten-batenverhouding voor legale activiteiten volgden de regels beter op dan bedrijven met een negatieve kosten-batenverhouding.

Voor wat betreft sociale motieven is in het onderzoek duidelijk geworden dat sociale druk heel belangrijk was als factor die het overtredingsgedrag van houtkapbedrijven bepaalt. Ten eerste hadden bedrijven een hoge perceptie van regelovertreding door hun collega's, wat hen beïnvloedde om hetzelfde te doen. Ten tweede wisten de bedrijven dat kettingzagers illegaal bomen rooiden. Voor de meeste bedrijven met een vergunning is dit misschien wel de belangrijkste factor die hen tot overtreding aanzet. Ten derde stonden bedrijven onder druk van de lokale gemeenschappen, waarbinnen zij werkzaam waren, om infrastructurele en monetaire steun te bieden; om aan deze eisen te voldoen, voelden zij zich gedwongen om de regels te overtreden. In het onderzoek werd geen bewijs gevonden dat bedrijven onder druk werden gezet door leden van de lokale gemeenschap of door de vereniging van houthandelaren om zich wel aan de regels te houden. Toch werden in dit onderzoek enkele bedrijven gevonden waarvan de beslissingen tot naleving hoofdzakelijk werden beïnvloed door de wens om een goed bedrijfsimago te creëren of hun reputatie hoog te houden.

Voor wat betreft de normatieve motieven en hoe deze het nalevings- of overtredingsgedrag van bedrijven beïnvloedden, werd in het onderzoek gekeken naar het gevoel van actoren gehouden te zijn tot naleving (moraliteit), de door hen gepercipieerde redelijkheid van de wet alsmede de gepercipieerde legitimiteit van de regulerende instantie. Uit het onderzoek bleek dat deze drie factoren meer bijdroegen tot het overtredingsgedrag van bedrijven dan tot het nalevingsgedrag. Voor de meeste bedrijven waren de beslissingen om zich al dan niet aan de regels te houden louter gebaseerd op economische motieven en speelden morele overwegingen geen rol. Er waren echter een paar bedrijven die bij hun besluit om de regels na te leven dan wel te overtreden morele overwegingen en met name de hoop op 'een eeuwig leven in het hiernamaals' van cruciaal belang vonden, meer dan welke economische overweging ook. Uit het onderzoek kwam naar voren dat de meeste bedrijven de bestaande regelgeving inzake houtkap, waarin het aantal bomen dat zij mogen kappen in bos dat bestemd is voor productie wordt beperkt tot drie bomen per hectare, als onredelijk beschouwden en hun onvrede daarover uitten door overtreding van de regels. Welbeschouwd maakte het onvermogen van de regelgevende instanties om het verbod op illegale houtkap door kettingzagers krachtdadig te handhaven, het heel moeilijk voor hen om de houtkapregels te handhaven jegens bedrijven met een vergunning. Deze bedrijven vonden het onrechtvaardig dat de regelgevers hen de duimschroeven aandraaiden terwijl de kettingzagers

die illegaal bomen kapten straffeloos hun gang konden gaan. Het resultaat hiervan was een afnemende legitimiteit van de regelgevende instanties dat zich mogelijk uitte in een gering nalevingsgedrag.

In hoofdstuk 4 wordt getracht inzicht te krijgen in de beweegredenen van kettingzagers om de regelgeving inzake houtkap te overtreden. Het onderzoek geeft waardevolle inzichten in motieven van actoren die het basisprincipe van deze regelgeving aan hun laars lappen. Zij werken op plekken zonder enige legale basis daarvoor, dus volledig illegaal. De bevindingen onderstreepten dat de volgende factoren een belangrijke rol speelden bij hun overtredingsgedrag: onvoldoende afschrikking, steun vanuit de samenleving voor criminele activiteiten, de perceptie van corruptie bij instellingen, en contextuele factoren. Uit het onderzoek bleek dat de perceptie van lichte straffen, én de financiële voordelen die voortvloeien uit illegale activiteiten de belangrijkste drijfveren waren voor het overtredingsgedrag van de kettingzagers. De bestaande sancties op overtreding werden ervaren als licht en wellicht onvoldoende om overtreders ervan te weerhouden om illegale praktijken uit te oefenen. Afgezien daarvan waren er invloedrijke personen op verschillende bestuursniveaus die zich in veel gevallen ingezet hebben voor hun verdediging; om hen hun straf te laten ontlopen of de sancties te verminderen uit economische, sociale en politieke overwegingen. Daarbij verbleekt de dreiging van sancties als beleidsinstrument om naleving te stimuleren, en blijft de overtreding voortduren.

Met betrekking tot sociale motieven toont het onderzoek aan dat er een grote sociale acceptatie en ondersteuning bestaat voor het overtredingsgedrag. Hier zijn verschillende redenen voor. Ten eerste was er (en is er nog steeds) een grote vraag naar – en politieke steun voor – hout van kettingzagers op de binnenlandse markt. Het is gemakkelijk verkrijgbaar en goedkoper dan hout van erkende houtkapbedrijven. Ten tweede heeft het bijgedragen aan het creëren van banen voor jongeren in en rond de lokale gemeenschap waar kettingzagers actief waren. Er zijn dus veel mensen die voor hun levensonderhoud afhankelijk zijn van de illegale activiteiten. Ten derde ondersteunen de kettingzagers met geld en hout de ontwikkeling van infrastructuur zoals schoolgebouwen, klinieken, en bruggen in de lokale gemeenschappen waar ze actief zijn. Het onderzoek heeft geen sociale sancties en pressie vanuit de lokale gemeenschappen kunnen optekenen.

Met betrekking tot de normatieve motieven richtte het onderzoek zich op de persoonlijke morele normen van de actoren, de perceptie van redelijkheid van de wet die de activiteit van kettingzagers verbiedt, en de legitimiteit van de regelgevende instantie. Met betrekking tot persoonlijke normen, komt uit het onderzoek naar voren dat overtreding van de wet 'normaal' gevonden wordt en geen schaamte- of schuldgevoelens veroorzaakt bij de kettingszagers. Voor hen gaat het werk om levensonderhoud en overleving en heeft het niets te maken met moraliteit. Een andere bevinding was dat actoren ontevreden waren over de wet die houtkap met kettingzagen illegaal maakte omdat deze wet hun levensonderhoud en kansen om te overleven onder druk zette. Verder laat de studie zien dat de legitimiteit

van de regelgevende instantie in de ogen van de kettingzagers wellicht in het gedrang kwam, omdat zij in veel gevallen steekpenningen moesten betalen wanneer zij werden gearresteerd. Ten laatste wijst het onderzoek uit dat een aantal contextuele factoren, zoals armoede en politieke zaken, een cruciale rol spelen in het overtredingsgedrag van de gereguleerde actoren.

In hoofdstuk 5 wordt onderzocht hoe de handhavingspraktijk van de Forestry Commission (FC) met betrekking tot het opsporen van overtredingen en het reageren daarop met sancties helpt om de naleving dan wel overtreding van de wet inzake houtkap te bevorderen. In het onderzoek worden drie categorieën van eerstelijns functionarissen geïdentificeerd die rechtstreeks betrokken zijn bij de handhaving van de houtkapwetgeving in Ghana: boswachters, gebiedsopzichters en districtsmanagers. De boswachters zijn de medewerkers in de eerste lijn in de bossen en hun belangrijkste taak is het bewaken van de grenzen van de beschermde bosgebieden. Deze functie omvat het verwijderen van wildgroei met een machete en het patrouilleren om overtreders op te sporen en aan te houden. Gebiedsopzichters vormen de middenlaag die toezicht houden op de boswachters en daarnaast inspecties uitvoeren in houtkapgebieden om erop toe te zien dat alleen bomen die daartoe rechtens zijn aangewezen, worden gekapt. Weer een laag hierboven staan de districtsmanagers, wiens primaire taak bestaat uit het coördineren van alle handhavingsactiviteiten binnen een bosdistrict.

Het onderzoek toont aan dat overheidsfunctionarissen om verschillende redenen problemen ondervonden bij het opsporen van overtredingen. Ten eerste waren er onvoldoende middelen beschikbaar: te weinig personeel, problemen met het transport en een gebrek aan financiële middelen. Het gevolg hiervan was een verhoogde werklast, een minder frequente inspectie en een verlaagde opsporingskans. Vastgesteld werd dat boswachters het hardst getroffen werden door dit tekort aan middelen, daarna de toezichthouders en vervolgens de districtsmanagers. Ten tweede gebruikten de overtreders verschillende strategieën waarmee ze de kans om opgepakt te worden tot een minimum konden beperken. Zo werkten ze bijvoorbeeld midden in de nacht, in het weekend en op wettelijke feestdagen. Ook maakten ze bij het transport van het hout gebruik van voertuigen die vooruit reden om hen te waarschuwen voor routes die ze beter konden vermijden om verzekerd te zijn van een veilige doorgang.

Uit het onderzoek blijkt dat, om de opsporing te verbeteren, elk bosdistrict een 'werkgroep hout' heeft die bestaat uit een assistent-districtsmanager of een gebiedsopzichter (als hoofd) en medewerkers van de politie en/of het leger als leden. De medewerkers van deze werkgroep patrouilleren vooral op snelwegen en voeren steekproeven uit op uitzichtpunten om vrachtwagens die houtproducten vervoeren te inspecteren. Ze reageren ook op verzoeken van boswachters of gebiedsopzichters om hulp bij het aanhouden van overtreders of het afvoeren van hout dat met kettingzagen is gekapt. De werkzaamheden van deze werkgroepen brengen echter een aantal problemen met zich mee. Ten eerste richten ze zich met name op patrouilles op

de wegen en inspecties vanuit hun controleposten in plaats van zich in de bossen te begeven om de illegale houtkappers op te sporen. Ten tweede zijn met het veiligheidspersoneel hoge personeelskosten gemoeid. Ten derde zijn beweringen over corruptie, en beschuldigingen van afpersing van illegale houtkappers en 'fronting' voor hen schering en inslag.

Naast het proactieve opsporingswerk van functionarissen in de eerste lijn, is men ook afhankelijk van meldingen en klachten van zowel betaalde als vrijwillige informanten om overtredingen op te sporen – de zogenaamde reactieve opsporing. De betaalde informanten zijn individuen en groepen die tegen betaling informatie over illegale houtkap verstrekken, terwijl vrijwillige informanten dit doen om andere dan financiële redenen. Hoewel dit zeer nuttig en zinvol is, geeft het gebruik van informanten bijkomende problemen zoals afpersing van geld en het lekken van informatie aan illegale houtkappers over voorgenomen inspecties en bewegingen van handhavingsfunctionarissen, zodra informanten hiervan op de hoogte zijn; hierdoor worden de inspanningen van het werken met informanten gedwarsboomd.

Over de manier waarop overtreders worden behandeld, bleek uit het onderzoek dat de bestaande wettelijke regelgeving twee soorten sancties voorschrijft, namelijk administratieve boetes en door de rechter vastgestelde boetes en straffen. Een andere bevinding was dat zowel de FC als de rechtbanken onder de bestaande wettelijke regelingen onvoldoende bevoegdheden hebben om zware sancties op te leggen. De boetes en straffen onder de huidige wettelijke regelingen zijn onmiskenbaar laag in vergelijking met de voordelen die voortvloeien uit overtreding. Tevens bleek uit het onderzoek dat, zelfs als de wettelijke regelgeving zwaardere sancties toestond, de FC niet in staat was deze op te leggen, voornamelijk als gevolg van inmenging vanuit politieke, sociaal-culturele of bestuurlijke kringen. Tevens werd vastgesteld dat de FC de voorkeur gaf aan het uitdelen van administratieve boetes boven het vervolgen van zaken via de rechtbank, onder meer vanwege de lage prioriteit die zaken met betrekking tot houtkap hebben bij de rechterlijke macht. Ten slotte werd in het onderzoek opgemerkt dat het lage loon dat functionarissen in de eerste lijn ontvangen en corrupte praktijken in het reguleringsproces een aanzienlijke belemmering vormen voor de succesvolle opsporing en bestraffing van illegale houtkappers.

In dit proefschrift wordt aanbevolen om de opsporing van illegale houtkappers te verbeteren door middel van luchtpatrouilles en verkenningssurveys met gebruik van drones en andere moderne technologieën, een reële kans dat zware sancties daadwerkelijk worden uitgedeeld aan illegale houtkappers en functionarissen die betrapt worden op corruptie. Ook een sterk netwerk van lokale en internationale actoren, waarbij media en maatschappelijke organisaties een controlerende rol spelen, zou wenselijk zijn om de effectiviteit van de handhaving te verhogen.

In hoofdstuk 6, conclusies, worden de belangrijkste bevindingen en inzichten gepresenteerd, en de implicaties daarvan voor de theorie, en voor de regelgeving, naleving, en handhaving in de bosbouw. In algemene zin

heeft dit onderzoek bijgedragen aan een beter begrip van de factoren die van invloed zijn op nalevings- en overtredingsgedrag in de context van een ontwikkelingsland. Ten eerste heeft het onderzoek aangetoond dat de huidige sancties van de staat voor illegale houtkap licht zijn waardoor er een grote stimulans voor houtkappers is om de regelgeving inzake houtkap te overtreden. Het moge duidelijk zijn dat als, voor rationele of op winst gerichte actoren, de overtreding van regels hogere financiële voordelen oplevert dan wat de eventuele sancties bij overtreding hen kosten, deze regelgeving eerder zal worden overtreden dan nageleefd. Een beleidsinzicht voor Ghana en andere landen die de naleving in een dergelijke situatie willen verbeteren, zou moeten zijn dat men maatregelen in zou moeten voeren die het overtredingseffect van lage sancties tegengaan. In feite vormt deze suggestie de basis voor een op afschrikking gebaseerde naleving. Zwaardere sancties zullen de naleving verhogen en vice versa.

Ten tweede blijkt uit het onderzoek dat bedrijven die naar de EU-markt exporteerden en/of zich bezighielden met houtcertificeringsprocessen de regels beter naleefden. Hier laat het onderzoek zien dat deze bedrijven zich eerder aan de regels houden door informele sancties van actoren die buiten de staat staan dan door dreiging van sancties van toezichthouders van de staat. Een theoretisch inzicht dat uit deze bevinding voortkomt is dat afschrikking, in de zin van angst voor sancties, afkomstig kan zijn van andere bronnen dan alleen de staat (Grasmick and Bursik Jr., 1990; Rooij, 2016). Een beleidsimplicatie die hieruit voortvloeit is dat de nationale regelgevende instantie de huidige opzet van regulering die het overheidsbeleid en de wet als het enige instrument hanteert, moet worden herzien ten gunste van een regulering die verschillende instrumenten gebruikt die door een aantal niet-overheidspartijen, commerciële partijen en ngo's worden toegepast. Een dergelijke structuur draagt niet alleen bij aan het behalen van betere resultaten tegen lagere kosten, maar zorgt er ook voor dat schaarse overheidsmiddelen beschikbaar komen, die ingezet kunnen worden in gevallen waar alleen directe interventie door de overheid mogelijk is (Gunningham, 2011). In dit verband zou een netwerk van lokale en internationale actoren wenselijk zijn.

Ten derde wordt uit het onderzoek duidelijk dat sommige bedrijven, zij het kleine, zich niet inlaten met illegale houtkap vanwege andere redenen dan afschrikking, zoals religieuze overtuigingen – de hoop op een hiernamaals – en de noodzaak om het bos voor toekomstige generaties te beschermen. Dit is een belangrijke bevinding die laat zien dat naleving van de regels mogelijk is met beperkte afschrikkingsmiddelen – of zelfs helemaal geen – vanuit de staat of de samenleving. Dit betekent dat regelgevende instanties de naleving kunnen verbeteren door middel van niet-afschrikwekkende en betaalbare middelen, zoals het gebruik van eenvoudige berichten of advertenties die actoren erop wijzen dat naleving van de regels goed is, en het juiste om te doen. Een ander inzicht is het belang van contextuele factoren om het overtredingsgedrag van houtkappers in Ghana te begrijpen. De sociaal-economische-, politieke -, en culturele context van het

land vertoont kenmerken die de inspanningen op het gebied van naleving en handhaving van regelgeving ondermijnen.

Dit alles laat zien dat het verbeteren van de naleving van de regelgeving een gecompliceerd vraagstuk is en niet slechts een eenvoudige calculatie om met verhoogde sancties een hoger niveau van naleving te bereiken, zoals de theorie van afschrikking ons zou willen laten geloven. Immers, naleving van regelgeving heeft ook andere dimensies, zoals sociale, normatieve en politieke. Om de naleving van regelgeving door verschillende actoren te verbeteren, is het van belang dat beleidsmakers en uitvoerders inzicht hebben in de verschillende motieven van de verschillende actoren op basis waarvan zij hun nalevingsgedrag bepalen onder verschillende sociale, politieke, economische en culturele omstandigheden. Er is nog veel nader onderzoek noodzakelijk om vast te stellen hoe deze factoren, onafhankelijk van elkaar of in combinatie met elkaar, het nalevingsgedrag van de gereguleerde actoren beïnvloeden. Een ander aandachtspunt voor toekomstig onderzoek is hoe een slimmere mengvorm – of het versterken van de bestaande mengvorm – van publieke en private *governance* kan worden gecreëerd; en hoe nationale en transnationale *governance* structuren/netwerken ingezet kunnen worden om het probleem van illegale houtkap en houthandel aan te pakken.

Curriculum Vitae

Joseph Boakye was born in Kumasi, Ghana on October 13, 1967. He had his basic education at Akrodie Roman Catholic School in the Ahafo Region of Ghana and attended Obuasi Secondary Technical School from 1980 to 1987 for his Ordinary and Advanced Levels Certificates. As part of the then post A-level National Service, he taught for one year at Ampabame Junior High School in the Ashanti Region of Ghana. He graduated in Natural Resource Management (Silviculture and forest management option) at Kwame Nkrumah University of Science and Technology (KNUST), Kumasi in 1991. After that, he completed another year of National Service at the then School of Forestry, Sunyani teaching courses in Botany, Geology and Soil, Agroforestry and Social Forestry. He joined the then Forestry Department in October 1992 as an Assistant Conservator of Forests and posted back to School of Forestry to assist with the training of technical level manpower for the Department. In September 1993, he was transferred to Enchi in the Western Region of Ghana as the District Forest Manager for two years and then to Bibiani in the Western North Region as the District Forest Manager.

Meanwhile, in September 1997, he was offered a TEMMPRO grant to study MSc Environmental Science at Turku University, Finland. On successful completion and return to Ghana, he was reassigned to the Regional Forest Office, Takoradi, Western Region in April 1999. After four months, he was transferred to Goaso in the Ahafo Region as the District Forest Manager for a year and then promoted to the grade of an Assistant Regional Manager at the then Brong Ahafo Region. In addition, between 2000 and 2005, he taught courses in Forest Ecology and Environmental Protection as a Part-time lecturer at the then College of Renewable Natural Resources, Sunyani. He graduated with Master's Degree (MA) in Industrial Management at KNUST in 2004. In September 2004, he was transferred to Koforidua in the Eastern Region as Assistant Regional Manager and, in 2005 obtained a Professional Graduate Diploma in Management Studies from the Institute of Professional Managers' Association in England.

He studied Law at the University of Ghana, Legon, graduating with Bachelor of Laws (LLB) in 2006 and continued to the Ghana School of Law to complete the professional law course in 2008. He was called to the Ghana Bar in October 2008. In July 2008, he was promoted to the grade of Operations Manager for the Forest Services Division (Headquarters, Accra). After two years in Accra, he was again transferred to the Ashanti Region as the Regional Forest Manager. In May 2013, he was offered a NUFFIC grant to pursue a PhD research at the Van Vollenhoven Institute for Law, Governance

and Society of Leiden Law School of Leiden University under the supervision of Prof. Otto and Prof. van Erp. Presently, he works as Director, Forestry Commission Training Centre, a position he has held since June 2014. Apart from his work as Director, he also teaches Natural Resource Legislation and Governance (post-graduate level) as a part-time lecturer at the KNUST. As part of his professional career, he has served as a key resource person at several workshops on natural resource management, policy, law, enforcement and governance, and participated and presented papers at numerous conferences and workshops.

In the range of books published by the Meijers Research Institute and Graduate School of Leiden Law School, Leiden University, the following titles were published in 2019 and 2020:

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