Understanding Political Economic Conditions that impact World Health Organization Framework Convention of Tobacco Control (WHO FCTC) implementation in the African Region

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List of Abbreviations

Africa Center for Disease Control (Africa CDC)

British American Tobacco Nigeria (BATN)

Canadian Coalition for Global Health Research (CCGHR)

Canadian Institute of Health Research (CIHR)

Corporate Social Responsibility (CSR)

Demographic Health Survey (DHS)

European Union (EU)

Fast Track Land Reform Program (FLTRP)

Food and Agriculture Organization (FAO) of the United Nations (UN)

Gross Domestic Production (GDP)

International Committee of Medical Journal Editors (ICMJE)

Interpretive description (ID)

Key informant interviews (KIIs)

Key informants (KIs)

Low and Middle Income Countries (LMICs)

National Institutes of Health (NIH)

Non-communicable diseases (NCDs)

Personal protective equipment (PPE)

Sustainable Development Goals (SDGs)

Tian Ze Tobacco Company (TZTC)

Tobacco Industrial Marketing Board (TIMB)

Transnational Tobacco Companies (TTC)

World Food Program (WFP)

World Health Organization (WHO)

World Health Organization Framework Convention of Tobacco Control (WHO FCTC)

Zambia Chamber of Commerce and Industry (ZACCI)

Abstract

Abstract in English

In the absence of effective policy interventions, an estimated 1 billion people are projected to die from tobacco use in the 21st century. The World Health Organization's (WHO) Framework Convention of Tobacco Control (FCTC) currently guides efforts to strengthen global tobacco control. While tobacco use has reduced globally, low- and middle-income countries (LMICs) struggle to implement treaty provisions. The African region especially, has been targeted by the tobacco industry as a potential market. This dissertation contributes to the knowledge base targeted at strengthening WHO FCTC implementation. Based on the priority areas identified in the WHO FCTC impact report and the existing research on the political economy of tobacco in LMICs, this study pursues the following objectives: 1) examine how academic research on WHO FCTC implementation considers contextual factors in the African region, 2) explore stakeholder perspectives on the conditions that shape tobacco policy in Zimbabwe and 3) identify potential supply reduction policy pathways in Zimbabwe and other countries within the African region.

Key findings for objective 1 suggest that situational contextual factors such as burden of disease or impact on health can push governments toward policy formulation. Structural factors included political considerations, economic interests, funding, institutional congruence, the strength of policy, and institutional capacity as important. Cultural factors included the influence of policy entrepreneurs, current social trends, and public

opinion. Exogenous actors included the WHO FCTC, tobacco industry influence at the national level and bi-lateral partnerships.

Objective 2 findings included the following main themes. There was stakeholder consensus on the government prioritizing tobacco as it is a key foreign income earner. However, stakeholders noted that smallholder farmers face low earnings and are trapped in debt. Stakeholders also noted public and environmental health concerns including risks to farmer health and deforestation and its climate impacts. Finally, stakeholders indicated it is unlikely for Zimbabwe to move away from tobacco farming within the next decade given its priority in country development strategies.

Findings for objective 3 indicate that main pathways for supply reduction in agriculture-based economies, such as the top five tobacco growing countries in the African region, are to enhance opportunities, resources and capacity to transition towards alternative crops. The strengthening of financial infrastructure for alternative crops, establishing profitable markets and removing government subsidies for the tobacco industry are key steps for this transition. Policy formulation can be drawn from key exemplars and technical guidance resources (e.g. WHO FCTC toolkits). Key to advancing policy processes is leveraging existing evidence on the harms of tobacco farming and economic potential of alternatives to convince decision-makers. Pathways for successful processes are dependent on actor synergy within research, civil society, and governance actors. While this research focuses on the African region, its findings is relevant to other LMICs who face similar political and economic challenges related to tobacco control.

Résumé en français

En l'absence d'interventions politiques efficaces, on estime qu'un milliard de personnes mourront du tabagisme au cours du 21e siècle. La Convention-cadre de l'Organisation mondiale de la santé (OMS) pour la lutte antitabac (CCLAT), entrée en vigueur en 2005, est l'un des traités mondiaux les plus largement adaptés en matière de santé. Les évaluations d'impact de la première décennie d'application de la CCLAT de l'OMS ont montré que si le tabagisme a diminué à l'échelle mondiale, les pays à revenu faible et intermédiaire (PRFI) n'étaient pas en mesure de respecter les normes minimales. La région africaine, en particulier, a été ciblée par l'industrie du tabac en tant que marché potentiel. Cette étude vise à contribuer à la base de connaissances destinée à renforcer la mise en œuvre de la CCLAT de l'OMS. : 1) examiner comment la recherche universitaire sur la mise en œuvre de la CCLAT de l'OMS prend en compte les facteurs contextuels dans la région africaine, 2) explorer les perspectives des parties prenantes sur les conditions qui façonnent la politique du tabac au Zimbabwe et 3) identifier les voies potentielles d'une politique de réduction de l'offre au Zimbabwe et dans d'autres pays de la région africaine.

Les principales conclusions de l'objectif 1 sont que les facteurs contextuels situationnels, tels que la charge de morbidité ou l'impact sur la santé, peuvent inciter les gouvernements à formuler des politiques. Les facteurs contextuels structurels comprennent les considérations politiques, les intérêts économiques, le financement, la cohérence institutionnelle, la force de la politique et la capacité institutionnelle. Les facteurs contextuels culturels comprennent l'influence des entrepreneurs politiques, les tendances sociales actuelles et l'opinion publique. Les facteurs contextuels exogènes

comprenaient la CCLAT de l'OMS, l'influence de l'industrie du tabac au niveau national et les partenariats bilatéraux.

Les conclusions de l'objectif 2 ont porté sur les thèmes principaux suivants. Les parties prenantes s'accordent à dire que le gouvernement accorde la priorité au tabac, car il s'agit d'une source importante de revenus étrangers. Toutefois, les parties prenantes ont noté que les petits exploitants agricoles sont confrontés à de faibles revenus et sont pris au piège de l'endettement. Les parties prenantes ont également fait part de leurs préoccupations en matière de santé publique et environnementale, notamment les risques pour la santé des agriculteurs et la déforestation. Enfin, les parties prenantes ont indiqué qu'il était peu probable que le Zimbabwe abandonne la culture du tabac au cours de la prochaine décennie, compte tenu de sa priorité dans les stratégies de développement du pays.

Les résultats de l'objectif 3 indiquent que les principales voies de réduction de l'offre dans les économies basées sur l'agriculture, telles que les cinq principaux pays producteurs de tabac de la région africaine, résident dans le renforcement des opportunités, des ressources et des capacités de transition vers des cultures alternatives. Le renforcement de l'infrastructure financière pour les cultures alternatives, l'établissement de marchés rentables et la suppression des subventions publiques à l'industrie du tabac sont des étapes clés de cette transition. La formulation des politiques peut s'inspirer d'exemples clés et de ressources d'orientation technique (par exemple, les boîtes à outils de la CCLAT de l'OMS). Cependant, les processus politiques dépendent fortement de l'exploitation des preuves existantes sur les méfaits de la culture du tabac et du potentiel économique des alternatives pour convaincre les

décideurs. La réussite des processus dépend de la synergie entre les acteurs de la recherche, de la société civile et de la gouvernance. Bien que la recherche se concentre sur la région africaine, les résultats de cette recherche ont des implications pour les PRFI dans le monde entier.

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Contribution to Original Knowledge

All three manuscripts within this thesis contribute to original knowledge within the academic fields of political economy on factors affecting health, the political economy of tobacco control, and policy pathways in supply reduction. The findings of these studies are directly relevant to the implementation of the WHO FCTC. By extension this research also contributes to strengthening non-communicable disease burden reduction agendas and achieving Sustainable Development Goal 3 (Health for All).

The first manuscript systematically examines how academic research on WHO FCTC implementation has considered contextual factors in the African region. The outputs contribute to understanding the extent academic research examining WHO FCTC implementation in African region addresses contextual factors. Furthermore, this research identifies and analyses contextual factors related to national level WHO FCTC implementation in the WHO African region.

The second manuscript contributes to the original knowledge base on the political economy of tobacco in Zimbabwe via qualitative interviews with stakeholders. These stakeholders are from government ministries, para-statal bodies, industry, farmer unions, non-governmental organizations, intergovernmental organizations, academia, and more. We highlight the common and differing views of the diverse stakeholders in relation to the political economy of tobacco in Zimbabwe. These subject areas include current tobacco farming processes, farmer wellbeing, the public health impact of tobacco use, the impact of the tobacco industry, the environmental impact of tobacco

farming, implementation of the WHO FCTC in Zimbabwe, alternative crops and their sustainability and the future of tobacco in Zimbabwe.

The third manuscript provides a detailed policy analysis using the health policy triangle by Walt and Gilson to outline policy pathways for supply reduction in the African region. To this end, this analysis uses existing literature on supply reduction policy (academic and grey) and expert input via key informant interviews with supply reduction experts. Using the four components of the health policy triangle (context, content, processes, actors) this paper outlines potential supply reduction pathways, relevant contextual background, as well as existing key resources and best practices to draw from.

The discussion of this dissertation examines the applicability of the findings to broader low- and middle-income country settings and how best to advance political economy focused research with the goal of strengthening the implementation of the WHO FCTC.

This thesis also contributes to the field of Family Medicine and Primary Care as tobacco use and tobacco farming have a direct impact on health outcomes, health system use, and the wellbeing of the public, youth and smallholder farmers. Additionally, prevention of risk factors remains a key focus in family medicine which WHO FCTC is designed to strengthen. Furthermore, social determinants of health are impacted by tobacco use and tobacco farming, including economic wellbeing. Social determinants of health are intrinsically connected to political and commercial determinants of health as well.

WHO defines health as an all-encompassing concept, not limiting it to clinical outcomes. As per the WHO constitution, health is “a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity.” Thus, the findings of this

thesis are strongly relevant to improving health in a multidisciplinary manner. This includes the relevance to family medicine and primary care in terms of minimizing the impact of tobacco on health system use, health outcomes, and cost. This research also contributes towards understanding and addressing social, political, and commercial determinants of health which is essential to strengthening prevention efforts related to non-communicable diseases. The relevance of prevention to family medicine was captured in the 2013 keynote to the World Congress of the World Organization of Family Doctors delivered by Dr. Margaret Chan, Director General of the WHO. In her speech focusing on the importance of family medicine, Dr. Chan states, “health systems must have specialists and hospitals, of course. But they must also have primary care doctors who care about prevention.” This thesis builds a strong evidence base and examines policy pathways contributing to multi-sector prevention efforts in non-communicable diseases, relevant to the interconnected fields of family medicine, primary care and public health.

Contribution of Authors

Shashika Bandara led the research conceptualization, design, implementation, data collection, analyses, and writing first drafts of all papers and subsequent drafts based on feedback from co-authors. He led the finalizing of manuscripts after incorporating edits and managed the submission processes to relevant journals.

For each manuscript (chapters 5 to 7), the roles of authors have been explicitly stated. All other chapters were written by Shashika Bandara and revised based on supervisor and thesis committee feedback.

Ethics Approval

Institutional Review Board (IRB) approval was obtained from the Institutional Review Boards of the Faculty of Medicine at McGill University, the University of Ottawa, and the Research Council of Zimbabwe (http://www.rcz.ac.zw/). Data collected from human subjects, including key informant interviews, have been collected with informed consent.

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Chapter 1: Introduction

In the 20th century, 100 million people died from tobacco use, and without effective policy interventions, an estimated 1 billion people are projected to die from tobacco use in the 21st century (1–6). Low- and middle-income countries (LMICs) will be impacted the most with an estimated 80% of the deaths occurring in LMICs by 2030 (1,7–10). As of July 2023, based on existing data the World Health Organization (WHO) reports use of tobacco causes 8 million deaths each year including 1.3 million due to secondhand exposure (11,12). According to the WHO, over 80% of the world's 1.3 billion tobacco users, including smokeless tobacco, live in LMICs (1,11). Recent research surveying approximately 90% of the population in LMICs indicated that one in five individuals aged 15 or older used tobacco (13). Ninety percent of young users become addicted by the age of 25, underscoring the importance of preventing smoking among adolescents (1,12,14). WHO estimates that tobacco use kills up to 50% of users who do not quit (11). The 2022 edition of the Tobacco Atlas, a synthesis of global evidence on tobacco control, indicates an increase in tobacco use among youth in 63 of the 135 countries surveyed (10).

Recognizing the globalization of the tobacco epidemic, the World Health Assembly in 2003 adopted the WHO Framework Convention of Tobacco Control (FCTC) which came into force in 2005 (15,16). As of May 2024, 183 Parties have signed on to the WHO FCTC making it one of the most widely adopted United Nations (UN) treaties (17). The provisions of the WHO FCTC outline strategies for both tobacco demand reduction (Articles 6-14) and supply reduction (Articles 15-17) (Table 1) (16). Demand reduction

focuses on decreasing consumption of tobacco including minimizing secondhand exposure while supply reduction focuses on reducing access to tobacco products and growing and manufacturing of tobacco (16). While the impact assessment of the first decade (2005-2015) of the WHO FCTC implementation indicates progress in reducing tobacco use globally, many countries were not on track to meet the minimum standards set by the WHO FCTC (15). LMICs have been comparatively slow in implementing the WHO FCTC compared to high-income countries (HICs). Furthermore, the WHO FCTC impact assessment of the first decade indicates that supply reduction implementation efforts need strengthening, globally (15). The slow implementation of supply reduction measures, particularly in countries where tobacco is grown, has created obstacles for wider implementation of the WHO FCTC, in large part because tobacco is viewed as an economic priority rather than a health-harming product (18–20). The need for supply reduction strengthening is also highlighted as a recommendation in the biennial progress report *"WHO report on the global tobacco epidemic 2021: addressing new and emerging products"* by the WHO FCTC secretariat (21). In countries where tobacco growing and manufacturing is a priority for governments, stronger industry interference in public policy, government support for the tobacco industry, and less restrictions on industry influences on popular culture through advertising, sponsorship and other promotional efforts, is observed (22–27). Such barriers to WHO FCTC implementation continue in tobacco growing countries like Zimbabwe, Malawi, Mozambique and others (22,28–30).

Table 1: WHO FCTC Articles and their focus areas

WHO FCTC article number and sub-category	Article description
Measures relating to the reduction of demand for tobacco	
Article 6	Price and tax measures to reduce the demand for tobacco
Article 7	Non-price measures to reduce the demand for tobacco
Article 8	Protection from exposure to tobacco smoke
Article 9	Regulation of the contents of tobacco products
Article 10	Regulation of tobacco product disclosures
Article 11	Packaging and labelling of tobacco products
Article 12	Education, communication, training, and public awareness
Article 13	Tobacco advertising, promotion, and sponsorship
Article 14	Demand reduction measures concerning tobacco dependence and cessation
Measures relating to the reduction of the supply of tobacco	
Article 15	Illicit trade in tobacco products
Article 16	Sales to and by minors
Article 17	Provision of support for economically viable alternative activities
Protection of the environment	
Article 18	Protection of the environment and the health of persons
Scientific and technical cooperation and communication of information	
Article 20	Research, surveillance, and exchange of information
Article 21	Reporting and exchange of information
Article 22	Cooperation in the scientific, technical, and legal fields and provision of related expertise

There remains important regional variation in WHO FCTC implementation shaped by several country-specific and regional factors. The African region is an emerging market for the tobacco industry (31,32). Researchers have noted that this is partly due to the continent's growing young population, evidenced in a predicted doubling of Africa's overall population by 2050 (33). A recent study (2022) highlighted that the tobacco industry continues to target new markets in the African region (10). The African region is one of two WHO regions that continues to see absolute numbers of smokers increase (10). An analysis focused on 22 African countries using Global Youth Tobacco Survey

(GYTS) from 2013-18 for adolescents aged 11-17 years, indicated that tobacco use and non-user susceptibility to using tobacco products among school going adolescents are high (34). Findings also indicated that one in ten school-going adolescents were current cigarette smokers (34). Important linkages have been found between rising tobacco use in the African region and the presence of tobacco farming (18). The success of the tobacco industry in promoting tobacco production as important to economic development, built on historical and institutional legacies, has created a strong foundation for the industry to oppose tobacco control policies (18,35,36). Industry influence is compounded by the lack of power health ministries have on economic decisions of the country or the disconnect between government ministries (18).

This study aims to contribute to the knowledge base targeted at strengthening the WHO FCTC implementation. The study examined the political economy of WHO FCTC implementation in the African region where four of the top ten global tobacco producing countries are located (37). The outputs of this research will inform pathways to strengthen supply reduction efforts in tobacco growing countries, while also providing insights into the wider political economy of WHO FCTC implementation in the region. Political economy analysis typically focuses on the interconnected aspects of politics, economics, power, markets and governments (38). Previous analyses indicate that the lack of understanding of the political economy of tobacco in LMICs by scholars and policy makers allow transnational tobacco companies to out-maneuver implementation efforts (39–41). For example, a recent review of the landscape of tobacco control in the African region highlights the need for capacity building of government personnel and increased monitoring of the industry as strategies to strengthen tobacco control (27).

Understanding the political economy can also help identify opportunities that can be leveraged to persuade governments to implement tobacco control policies, to better fund tobacco control programs, and to counter political and industry opposition to tobacco control (41). For example, econometric analyses in South Africa geared to local policy requirements substantially increased the willingness of the government to implement tobacco control policies (42).

Based on the goal of strengthening the knowledge base related to implementation of WHO FCTC, this study has three main objectives: 1) examine how academic research on WHO FCTC implementation considers contextual factors in the African region, 2) explore stakeholder perspectives on the conditions that shape tobacco policy in Zimbabwe and 3) identify potential policy pathways to supply reduction in Zimbabwe and other countries within the African region.

The rest of the thesis will have the following structure. Chapter 2 introduces definitions and ways of operationalizing the two key terms used in this study, namely *political economy* and *context*. This is necessary to understand the background and the research outputs within this overall study. Chapter 3 provides background, based on literature review, on three main aspects: global progress of WHO FCTC implementation, WHO FCTC implementation progress in LMICs, and overview of tobacco policy and policy context in Zimbabwe. This background is aimed at providing contextual grounding prior to diving into each of the three research studies derived from the three objectives outlined above. The background section will conclude with an extended rationale for the study objectives outlining their significance for WHO FCTC implementation and a roadmap for each manuscript. Chapter 4 will then provide details on the conceptual

foundations that inform the methodological approaches within this dissertation. These conceptual foundations include a *critical paradigm* and the *3-i political economy framework*.

After the above chapters, which are intended to situate the reader within the context, conceptual and methodological foundations of this overall study, I will present each of the three research papers in chapters 5-7 including bridging text between chapters. Chapter 8 will include an overall discussion of the work. Chapter 9 will provide a final conclusion for the thesis outlining the anticipated impact of research findings and research process reflections.

Chapter 2: Defining Key Concepts: Contextual Factors and Political Economy

Contextual Factors

Implementing the WHO FCTC requires an understanding of the local and international stakeholders that shape tobacco policy and programs, political factors that influence prioritization and agenda-setting pertaining to tobacco policy, socio-economic and cultural factors that shape public perspectives on tobacco both as an economic and health issue. This study will use Liechter's definition of context (or framework) which is widely used in health policy analysis (43). Liechter conceptualizes context in terms of four factors - situational, structural, cultural and environmental (also known as exogenous) factors (43,44). Definitions of these contextual factors are summarized in Table 1.

Table 1: Summary definitions of Leichter's contextual factors with examples

Contextual Factor Category	**Description**	**Examples**
Situational	Factors that stem from particular and less repetitive events such as war, health crises, or political instability	COVID-19 pandemic, armed conflicts (e.g., Afghanistan, Ukraine, Yemen, South Sudan)
Structural	Factors related to major, less transient elements of economic structure, political system, technological change, degree of urbanization, structure of the labor market and demographic structure	Shifts in economic policy or governance policies (e.g., economic policy or political strategy that impede WHO FCTC implementation such as Indonesia's economic development strategic plan that relies on tobacco)
Cultural	Factors related to socio-cultural elements such as the level of literacy, and values on issues such as religion, gender, participation, and corruption	Cultural identification with tobacco (e.g., Zimbabwe, Indonesia), Tobacco being an integral part of pop-culture (e.g., sport sponsorships by tobacco industry)
Environmental or exogenous	Factors that are external but relevant to the national political system such as the role of	WHO FCTC ratification, influence of global goals such as the SDGs,

	transnational companies and international agreements and events.	transnational tobacco companies.

Political Economy

A political economy approach to analysis assesses the political and economic factors shaping policy adoption, implementation, and enforcement. Benjamin Cohen who examined the history of International Political Economy (IPE) in his book *International Political Economy: An Intellectual History* and in his article *The Transatlantic Divide: Why are American and British IPE So Different?*, identifies two dominant schools of thought in IPE originating from American and British traditions of political economy (45,46). Cohen highlights the characteristics of these two schools of IPE by examining the work of pioneering political economy scholars such as Robert Keohane, Joseph Nye, Robert Gilpin, Peter Katzenstein, Stephen Krasner, Susan Strange, and Robert Cox (45,46). He notes important differences in the ontology and epistemology of each tradition, namely the assumptions about the nature of political and economic systems (ontology) and the ways to generate knowledge about these systems (epistemology) (45).

Briefly, in terms of epistemology, the American school of thought (referred to as the American School hereafter) prioritizes objective observation and systematic testing. The foundation of this method is based on empiricism (using what can be observed) and positivism (recognizing only which can be scientifically verified). The American School leans towards quantitative methodologies to test hypotheses and produce knowledge. The British school of thought (referred to as the British School hereafter) uses more qualitative and historical research approaches, often adopting interpretive and normative approaches to knowledge generation. The British School is aligned with

critical theory. In terms of ontology, the American School approach to IPE is state centric and is focused on state's system of governance. The British School approach to IPE treats the state as one of many agents and can even exclude the state in its analyses. The British School includes actors and institutions beyond the state that may interact with the state, but also directly impact political economy of the world. These actors and institutions include industry, intergovernmental and non-governmental organizations, community organizations. Additionally, while in the American School IPE is considered a subset of international relations with emphasis on public policy, the British School considers IPE as inclusive of other areas of inquiry including sociology, philosophy, religion, and law. Finally, the American School of IPE is understood to have the goal of identifying causality to resolve problems within systems of governance, while the British School has a normative emphasis on identifying and resolving systemic injustices (45,46).

Cohen, while observing that the American school of IPE dominates the current IPE discourse, also highlights the possibility and benefits of combining these approaches. Other scholars who examined this divide, such as Nicola Phillips and Catherine Weaver in their book *International Political Economy: Debating the Past, Present and Future,* highlight the importance of combining these two approaches to strengthen political economy analysis (47). Building on epistemological foundations of empiricism and positivism, the American IPE approach that centers on objective observations, systematic testing is a strength when analyzing economic, and other relevant data (e.g., smoking prevalence data) and their link to political decisions (e.g., government support for the tobacco industry). Drawing from critical theory, the British IPE approach of

considering larger social, cultural, and ethical challenges focused on causal explanations is also important for effective implementation and transformation of systems (45,47). The British School's approach of IPE which includes other disciplines such as law, philosophy in addition to international relations and public policy is important for understanding challenges that are not just rooted in state policy or economic growth.

This thesis draws from both schools of policy economy analysis, and considers political decisions (e.g., policy decisions on tobacco control), economic contributions and implications (e.g., GDP contributions by tobacco, industry presence and participation in policy decisions), socio-cultural forces (e.g., prevailing norms related to tobacco in society), ethical considerations (e.g., government relations with the tobacco industry) and many other aspects.

Chapter 3: Background, Research Rationale and Roadmap

This chapter presents an overview of the literature on key context related to this research, leading up to the rationale and the manuscript roadmap.

Global Progress of Tobacco Control and Supply Reduction

The WHO FCTC is an international treaty that presents measures to reduce tobacco consumption including secondhand exposure through demand reduction (Articles 6-14) and supply reduction provisions to decrease tobacco growing and product manufacturing (Articles 15-17) (15,16). In addition to reducing the demand for tobacco and measures to reduce supply, the WHO FCTC focuses on cross-cutting issues such as protection of the environment, conducting research, building scientific, technical and legal cooperation and sharing of expertise, reporting and exchange of information, and treaty governance (Table 1) (16).

WHO FCTC implementation has been integrated into the Sustainable Development Goals (SDGs). In 2015, a decade after WHO FCTC came into force, the SDGs were introduced with goal 3 dedicated *to ensuring healthy lives and promote well-being for all at all ages* (48,49). Within goal 3, target 3.a specifically focuses on strengthening the implementation of the WHO FCTC in all countries directly integrating the WHO FCTC implementation to the SDGs (48). Several United Nations agencies have emphasized the strong connection between reducing non-communicable diseases (NCDs) and implementing the WHO FCTC (49). At the national level, governments have indicated how WHO FCTC implementation can impact other SDGs such as reducing poverty (goal 1), zero hunger (goal 2) and reduced inequalities (goal 10) (48). For example,

Portugal has highlighted the negative impact of tobacco on health, healthcare expenditure, poverty and the environment as reasons for prioritizing WHO FCTC implementation in their voluntary national review (VNR) for SDG reporting (50). Palau, an island country in the western Pacific, has highlighted similar points in their VNR, emphasizing that WHO FCTC implementation should be considered a development issue not just a health issue, as it impacts reducing poverty, inequality, and hunger (50).

As indicated by country representatives and researchers, considering WHO FCTC implementation within health and development goals is crucial for the success of the WHO FCTC as well as the SDGs (48,51). Despite the linkages between broader development goals and the implementation of the FCTC, there are concerns that the WHO FCTC will only remain a priority for the health community (51). Small et al., highlights how tobacco-related agenda items appear to be far less discussed than other health priorities in national reports on SDG national consultations, thematic consultations, and high-level UN synthesis reports. They note that cross-sector collaboration continues to be a challenge for effective implementation of the WHO FCTC (51).

Despite many advances in FCTC implementation, evidence suggests that many countries are not on track to achieve the target of 30% relative reduction in adult tobacco use by 2025 (15). At the same time, countries that had policies which aligned or exceeded the minimum standards set by WHO FCTC guidelines, saw a decline in tobacco use (15). Additionally, while there have been important advances in demand reduction, other aspects of WHO FCTC pertaining to supply reduction such as promoting alternative livelihoods remain under-implemented (15,22). This under-

implementation is a cause for concern as the WHO FCTC identifies supply reduction as a critical dimension of a comprehensive approach to tobacco control (16,52–54). Impact assessment conducted between 2005-2015 reports that the implementation of WHO FCTC articles 8, 11, 12, 16 and 21 have made the most significant and rapid progress (Table 1). Articles 8, 11, 12 and 16 are all related to reducing demand for tobacco while article 21 focuses on reporting. Conversely, articles 5.3, 9, 17, 18 ,19 and 22 have made the least progress over the first decade (Table 1) (15). Articles 17 and 18 focus on moving to economically viable alternatives to tobacco growing and protecting the health of persons and environment related to tobacco cultivation respectively (16). Article 5.3 is dedicated to protecting tobacco control efforts from tobacco industry interference, which is an ongoing significant challenge especially in policy spaces at the national level (55).

Reflecting an absence of comprehensive policy efforts to adopt WHO FCTC in many LMICs, estimates suggest that by 2030, 80% of global mortality from tobacco will occur in these countries. Thus, it is vital to strengthen the implementation processes of WHO FCTC in LMICs. A key component of strengthening implementation is understanding the political economy of tobacco in LMICs with the understanding that these countries have diverse contextual factors such as economic conditions, political stability, political structures, social and cultural norms to name a few (56). For example, Zimbabwe has a history of tobacco farming that is tied to colonization and economic systems since colonization (36). As mentioned, a key component of strengthening the implementation of the WHO FCTC is to support tobacco growing countries (largely LMICs), to successfully implement articles 17 and 18 related to supply reduction. It is also

important to support leading tobacco growing LMICs to implement article 5.3 which focuses on combating industry influence. As of 2018, the four countries that had tobacco leaf export more than 1% of their GDP included Malawi, Zimbabwe, Mozambique, and North Macedonia (57).

WHO FCTC Implementation in LMICs

Although research and impact assessments indicate that WHO FCTC implementation is slower in LMICs compared to HICs, it is important to recognize that implementation and factors affecting implementation within LMICs vary and that LMICs are not a monolith (15,58,59). Countries within the LMIC category remain diverse in their progress and approaches in implementing the WHO FCTC. Diversity of implementation efforts is based on resource availability and other factors such as policy environment, policy enforcement, industry influence and social norms among others (39). Many LMICs have made important advances in WHO FCTC implementation, despite significant challenges. For example, Kenya and Uruguay successfully established and defended advertising and packaging measures against extensive legal opposition from the tobacco industry (60,61). Progress in establishing laws pertaining to specific articles of the Treaty including smoke-free spaces laws and increases in taxation remain mixed. For example, many low-income countries have made significant advances in increasing taxes on tobacco products, with countries like the Philippines and Kyrgyzstan showing some of the largest gains globally in 2018 for cigarette tax policy and Botswana, Peru, Ecuador being rated among the highest globally for cigarette tax policy in 2020 (62,63). At the same time, in the aggregate low-income countries show the lowest levels of tax increases when compared to other income categories (62). There are also notable

parallels between HICs and LMICs. One of the main broader parallels is the lack of progress made in implementing intersectoral coordinating mechanisms defined under Article 5.2 in both HICs and LMICs, which acts as a barrier to achieving comprehensive tobacco control policy measures (64). For example, interconnected approaches among development, agricultural and health sectors can improve cohesive implementation and resolve conflicts. Many tobacco control policies require the commitment of ministries other than health, like finance (taxation), education (information campaigns targeting youth), and agriculture (researching alternatives to tobacco). However, as observed in many tobacco growing countries like Indonesia and Zimbabwe, development and health strategies related to tobacco are often in conflict (25,65).

Many of these policy implementation efforts are affected by the perceived importance of tobacco as an economic commodity (22). A key aspect related to the economic conditions that impact WHO FCTC implementation is that many low-income countries have tobacco growing as a key component of their agribusiness sector, which leads to the government prioritizing tobacco as an economic strategy (23). The barriers to comprehensive tobacco control in these countries are often compounded by the entrenched institutions and perspectives that serve to perpetuate tobacco as an economic commodity (66–68).

Also important is pervasive industry interference impacting all the challenges outlined above. Often there is extensive and embedded industry presence within governments. In some countries, governments and the public consider the tobacco industry as part of national pride, going as far as to declare support for the industry. For example, the late past president of Zimbabwe, Robert Mugabe declared that “tobacco is our industry, and

we must support it," and in Indonesia, arguments against tobacco control include preserving *kretek* (hand rolled cigarettes) as a national heritage (25,26). To sustain these narratives, the tobacco industry continues to mobilize opposition to government regulation through think tanks and other organizations as well as direct lobbying and partnerships with government (25,55,56,61).

There is a need to systematically analyze both common and diverse contextual factors relevant to improving implementation of the WHO FCTC in LMICs. As Bump and Reich note, based on past evidence, lack of understanding of the political economy of LMICs has led to the tobacco industry outmaneuvering tobacco control efforts in LMICs (39). To ensure that global implementation considers contextual factors and in turn, better adapts WHO FCTC implementation, knowledge production processes such as academic research need to consider context as a key component.

Political Economy of Tobacco: A brief overview of Zimbabwe

As noted earlier, supply reduction remains a key area that requires strengthening to successfully implement the WHO FCTC (15). Tobacco growing countries, many of the top producers being in the African region, are facing the growing challenge of controlling consumption through demand-reduction measures while navigating away from tobacco growing through supply-reduction measures (39,58,69,70). Industry and many governments often promote the narrative that tobacco is a lucrative economic commodity, despite a growing body of research that shows the negative impact of tobacco farming on smallholder farmers (24,25,71,72). For example, smallholder farmers are often driven to debt and farming household members must incur a heavy

physical toll due to the labor-intensive nature of tobacco farming (22,72). As Lencucha and colleagues point out, “the continued success of the tobacco prosperity narrative is driven considerably by weak information and the strong voice of tobacco interests,” (22). These tobacco interests are promoted in a variety of ways, ranging from sports team sponsorship to corporate social responsibility projects (73–76).

Government support for tobacco growing creates barriers to advance tobacco control measures since the same companies they support to grow tobacco also aim to increase consumption and oppose regulation (26,39,77). Zimbabwe, despite signing the WHO FCTC in 2014, remains the largest producer of tobacco in the African region and one of the top five tobacco producers in the world (20,25,37,78). Tobacco has been systematically entrenched in government institutions in Zimbabwe since colonization (28). The contemporary political economy of Zimbabwe is shaped by Zimbabwe’s economy being weakened by its post-conflict policies from 1987 and its involvement in the armed conflict in the Democratic Republic of Congo in 1999 (79,80). Economic challenges were further exacerbated by international sanctions (81–83). Land reform and other policies that redistributed large plots of land to Zimbabwean smallholder farmers were implemented to strengthen rural economies and to garner favor from citizens in rural communities. These policies significantly reconfigured the supply chain (28). Barriers to WHO FCTC implementation include the country’s economic reliance on tobacco, the strong footprint of the tobacco industry within policy and political systems, the slow implementation of policies related to tobacco control, the expansion of land use for tobacco farming (with a growth increase of 86% of land use from 1997-2017), and government prioritization of the tobacco industry (28,84).

As per the latest available data, Zimbabwe's smoking prevalence is also on the rise: 31.2% of men and 2.1% of women used tobacco daily in 2015, up from 22.9% of men and 0.5% of women in 2011 (85). Particularly troubling is the higher rates of use among youth and those in the lowest economic quintile (85). The 2014 Global Youth Tobacco Survey (the latest non-projection based data) indicated that 20% of all youth aged 13-15 use tobacco (smoking and smokeless) (85). Tobacco for domestic consumption in Zimbabwe is largely provided from within the country. For example, an analysis from 2016 calculated a ratio between import and export of tobacco in Zimbabwe of 0.02 (86). Only 3000 tons of tobacco were imported in 2016, compared to 155,000 tons exported and 14,000 tons in the local market provided solely by local producers (86). The low trend of tobacco imports continued in 2019, with Zimbabwe importing just 1,911 kilograms worth of cigarettes that year; making Zimbabwe the fourth lowest tobacco cigarette importer in the world based on weight (87). Research reports indicate that Zimbabwe's domestic production also contributes towards the illicit trade of tobacco (both national and regional), making it difficult to assess the total amount of tobacco provided by local producers for domestic consumption (88).

Given the government's close ties with the tobacco industry, tobacco's importance as a source of foreign income, and the country's rising tobacco-related health challenges (e.g., increase in use among adolescents, tobacco farmer health), there is a need for intersectoral coordination for supply reduction and tobacco control to effectively implement the WHO FCTC (19,22,28,89). Without intersectoral coordination, as highlighted by article 5.2 in the WHO FCTC, government decision making processes

influenced by industry will continue to deprioritize effective implementation of supply and demand reduction articles of the WHO FCTC (90).

Understanding the political economy of Zimbabwe, as a key case study, including factors affecting its reliance on tobacco as an economic commodity, can contribute to strengthening intersectoral coordination (84,91). A deeper understanding of the political economy of tobacco in Zimbabwe will surface diverse interests of different stakeholders and provide insight on how policy changes may impact them. These considerations can inform intersectoral coordination and interrelated processes of consensus building. Successful intersectoral coordination can contribute to overcoming the siloed implementation processes of demand and supply reduction policies. For example, intersectoral policy efforts can benefit from a better understanding of preferred alternative crops or the feasibility of switching to an alternative crop and enable understanding about potential resistance within institutions for supply reduction policies (52,92).

Understanding the political economy includes examining political and economic policies impacting tobacco control, contextual factors that affect institutions, policy and stakeholder decision making, institutional positions related to tobacco control based on their priorities (e.g., strategic plans of ministries of health or ministry of finance and economic development), and perspectives of stakeholders on tobacco control policy implementation (30,43,93). Additionally, a political economy perspective can help identify the conditions that perpetuate pro-tobacco policy and programs, including institutional mandates, governance norms, and the channels used by interests to influence government action. This same lens can also identify and situate the efforts of

those pursuing stronger tobacco control measures and the contextual factors that facilitate or hinder this work.

Rationale and Objectives

The rationale for this research is informed by the background delineated above, the findings of the impact report of the WHO FCTC (2005-2015) and priorities highlighted in progress reports of WHO FCTC implementation (15,21,94). These findings indicate that WHO FCTC implementation in LMICs and the supply reduction-related articles of the WHO FCTC, require strengthening in order for the treaty to be effective (15).

As outlined in the introduction and the background sections above, in the absence of meaningful policy interventions strengthening the implementation of the WHO FCTC, LMICs will be most affected in terms of mortality and morbidity due to tobacco use (3,4,95,96). Additionally, the African region has become a clear priority for the industry as a market for tobacco and for tobacco farming (10,37). Given the varied levels of implementation progress and differing contextual factors affecting implementation at the national level, there is no 'one size fits all' process to implement the WHO FCTC. At the same time, research has shown consistencies in the political and economic conditions that shape implementation, particularly in tobacco growing countries such as strong industry presence, poor government coordination within, framing of tobacco as a lucrative commodity for farmers, framing of tobacco as a lower-level threat to public health (37,91,97). Understanding the political economy of LMICs including the African region countries related to tobacco can enhance implementation efforts by identifying the interests, institutions, and ideas that underpin pro-tobacco policies and programs and pathways to policy change (39,69). The situational, structural, cultural, and

exogenous factors, together defined as context, are central to understanding the political economy of tobacco in any setting (43). There is an urgency to strengthen policy implementation where the industry has a strong foothold and has strategic interests in terms of tobacco production and sales. This urgency is rooted in concerns about the increasing rates of youth tobacco use, the economic and health impacts of tobacco farming on smallholder farmers, and its environmental impacts. While the manuscripts that make up this thesis focus on the African region, their findings are relevant to WHO FCTC implementation in LMICs more broadly given commonalities in implementation barriers (e.g., government inertia, industry interference) and policy imperatives (e.g., tobacco farmer poverty, health impact on youth).

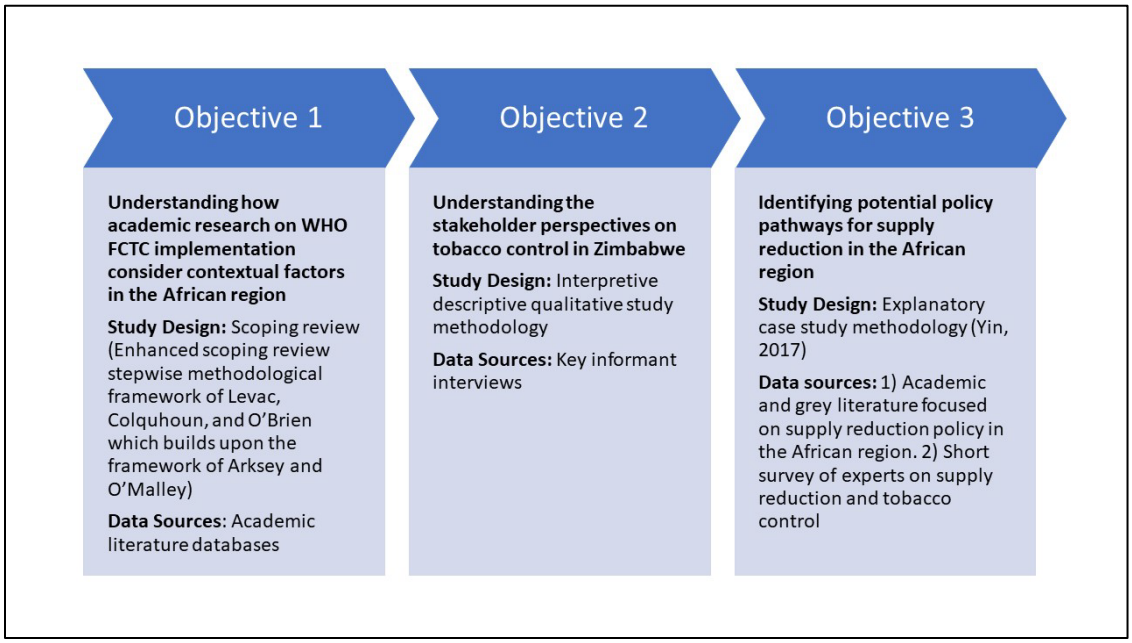
Given the rationale outlined above, the objectives of this thesis are to:

1. Examine how academic research on WHO FCTC implementation considers contextual factors in the African region
2. Explore stakeholder perspectives on the conditions that shape tobacco policy to understand the political economy of tobacco in Zimbabwe
3. Identify potential policy pathways for supply reduction in the African region with a specific focus on countries that have tobacco as a prominent economic commodity.

Below, I briefly outline the foundations and the approaches to operationalizing each of these objectives. Figure 1 summarizes each objective and the associated research design including methodology, methods, and key data sources. Each of the three manuscript chapters is crafted to address one of the three research objectives. Detailed

information on background, study methodology and methods, study findings, discussion of findings and relevant conclusions are provided in each manuscript.

Figure 1: Study details for each objective including study methodology, methods, and data sources



For the first objective, to support the strengthening of WHO FCTC implementation, I will examine how context is considered in WHO FCTC implementation in the African region. Academic research has played and continues to play an important role in tobacco control efforts including influencing the implementation of the WHO FCTC (98). For example, epidemiologic studies were crucial in measuring the extent of the impact of tobacco on human health and to push for evidence informed policies in tobacco control (8,98,99). Recognizing the importance of academic research, dedicated journals such as Tobacco Control by BMJ and Nicotine and Tobacco Research by Oxford Academics have been created to build a knowledge base to inform policy. Furthermore, underscoring the importance of academic research in informing global and national level

policies and trainings on tobacco control efforts, WHO has set up collaborative centers such as the WHO Collaborating Center on Tobacco Control and Surveillance housed at Johns Hopkins Bloomberg School of Public Health (100). While the tobacco industry has tried to distort the findings of research related to tobacco control by funding research that repeats tobacco industry viewpoints, this research is not validated or published in credible peer-reviewed academic journals which have strict clauses to prevent publications of tobacco industry-funded research. Given the important role academic research plays in influencing the improvement of WHO FCTC implementation and the necessity to strengthen WHO FCTC implementation in the African region, I will examine how academic research on WHO FCTC implementation has considered context in the African region. Employing a scoping review methodological approach, the first manuscript explores the extent to which current academic publications on WHO FCTC implementation have considered context and uses Leichter's categories of context to synthesize contextual factors found in the published literature.

For the second objective focused on understanding the political economy of tobacco in Zimbabwe, its associated manuscript will explore the government's role in tobacco control, industry influences within and outside the government, stakeholder perspectives (e.g., policy implementers, farmers, community) and the various forces driving national agenda setting. Given that LMICs are highly diverse, understanding the political economy of tobacco at the national level, especially in countries where tobacco is grown such as Zimbabwe, Malawi, or Mozambique, will provide opportunities for examining potential policy pathways for supply reduction (57). Accordingly, using a qualitative

approach, I examine the political economy of tobacco in Zimbabwe, the highest tobacco producer in the African region (57,96).

The third objective and associated manuscript seeks analyses context and political economic factors in Zimbabwe with the goal of identifying potential policy pathways for supply reduction. These policy pathways, built on existing research evidence and expert input, can help governments and other relevant stakeholders focus on sustainable alternatives, counter inaccurate industry narratives that tobacco is a lucrative and a necessary economic commodity, and counter future expansion of tobacco growing in the African region with lessons applicable to other LMICs (22,24,30,70). Building on the findings of the previous two manuscripts on the political economy of tobacco and incorporating new data from literature (academic and grey) and expert opinion, the third manuscript presents a policy analysis that outlines policy pathways for supply reduction in the African region.

Chapter 4: Conceptual Foundations of the Research Design

Research Paradigm

This research will use a critical paradigm approach (101). The critical paradigm focuses on issues of power relations in shaping societal structures and processes, and interrogates constructs like race, class, gender, education, economy, religion and other social institutions and how they operate to shape social systems (101). Based on Horkheimer's definition, critical theory, underpinning the critical paradigm, has three main criteria: "I. It must be explanatory about what is wrong with current social reality, II. It must identify the action to change it, and III. It must provide both clear norms for criticism and transformation." (101). Within this thesis I aim to understand how contextual factors are considered and inform WHO FCTC implementation, both research and policy. I align the critical paradigm with political economy theory to interrogate how political economic conditions shape tobacco control in Zimbabwe. The political economy approach focuses on both existing norms, policies and infrastructure and examines pathways for transforming the current policy infrastructure specific to supply reduction. Additionally, given that critical paradigm is concerned with power relations and existing social forces, it provides me with a philosophical basis to assess the stakeholder relationships, institutional, and industry interactions. The critical paradigm supports using multiple theories and methodologies to analyze contextually bound conditions, allowing the researcher to be considerate of the context in which the research is conducted (101). Thus, the critical paradigm aligns with my goals of using multiple research methodologies based on the research setting as I aim to examine

contextual factors related to WHO FCTC implementation and political economy of tobacco in Zimbabwe.

The 3-i Framework

The ’3-i’ political economy framework guided my research design across all thesis objectives. This framework structures political economy analysis using three main constructs: interests, ideas or information, and institutions (102). Helen Milner, in her book *Interests, Institutions, and Information: Domestic Politics and International Relations* argues that policy making depends on the interests of actors, information distribution and the nature of domestic institutions (103). Understanding each factor and how they are applied is important to understanding the framework as a whole.

Interests

In the framework, interests are based on desired outcomes of policy processes (102). Milner identifies three main interest groups at the domestic level who interact with international interests: the executive (prime minister or president), the legislature and interest groups (e.g., communities, organizations etc.). For example, the tobacco industry seeks to protect its core business of generating profits from the sale of tobacco and related products by opposing tobacco control measures like restrictions on advertising or taxation measures (26,104). Government sectors can represent different interests. For example, in countries such as Zimbabwe, where tobacco industry positions itself as a revenue generator, aiming to bring in comprehensive tobacco control policies can create tension between economic development and health related interests within government (22,105). This tension also exists outside of government

where non-state actors pursue different preferences. The Zimbabwe Tobacco Association favors promotion of tobacco farming while the Cancer Association of Zimbabwe supports comprehensive tobacco control policies. This framework points to policy processes as a contest where some win and some lose when certain policy decisions are made (102). For example, promotion of tobacco farming as a core development aim in Zimbabwe will be a win for the industry and associated pro-tobacco groups such as Zimbabwe Tobacco Association; it will be a loss for Cancer Association of Zimbabwe.

Ideas

Ideas refer to both information and also the prevailing values, cultures and ideological leanings of the society and interest groups (102,103). As Milner points out, ideas or information of interest groups who have high level of power can have stronger influence on policies. Additionally, unequal distribution of information can create political inequalities and cause inefficient outcomes. For example, the tobacco industry may collude with the government to gain information on impending policies in order to strengthen their opposition to the measure. The industry may also create and perpetuate false narratives about the impacts of tobacco use or farming in attempts to oppose or stall tobacco control measures (76). Governments may also set policy priorities based on prevailing notions of what constitutes economic development, including export-oriented growth. This idea of economic development is often used by governments to justify support for the tobacco industry or tobacco growing (22,24).

Institutions

The previous two constructs interact with and are embedded in institutions. Ostrom, in her essay *Doing Institutional Analysis: Digging Deeper than Markets and Hierarchies* argues that institutions are both visible and invisible (106). Visible institutions include those that are physically present and are clearly named such as government ministries, departments or agencies. Invisible institutions can exist around a set of norms, rules, and strategies in repetitive situations of action (e.g., the norms, rules and strategies that shape policy processes). Ostrom highlights that rules are prescriptive practices mutually agreed upon and enforced, norms are agreed upon practices with intrinsic costs and benefits, and strategies are plans made within the framework of accepted rules and norms. Institutions, both visible and invisible can play a significant role in restraining and advancing policies (102,106). For example, visible government institutions play a key role in adopting and advancing policy of tobacco control. An invisible institution would be a set of norms that demarcates the mandates of each sector, where the ministry of health would not consider trade policy priorities in its policy approaches, only considering health policy priorities (narrowly conceived), and vice versa for the ministry of trade. Another government may have norms that encourage intersectoral action, and the alignment of mandates across sectors.

The political economy approach has been adopted by many government agencies to assess policy processes and contexts. For example, the Department for International Development (DFID), United Kingdom (currently replaced by Foreign, Commonwealth & Development Office) uses political economic analysis to assess implementation of their international development projects (93). UK government guidance follows a similar

approach to the '3-i' framework above. Analyses of tobacco control policy implementation also carry a similar message highlighting the importance of understanding political economy of countries for successful tobacco control policy implementation. Bump and Reich analyzed the political and economic dimensions that shape tobacco control policy adoption, implementation, and enforcement in LMICs and highlighted the need for further understanding of the political economy of tobacco at national levels (39). Their methods highlighted the importance of both politics and economics in resource distribution, aligning their definitions with organizations such as the World Bank and DFID (39,107,108). Ssennyonjo et al. in an article examining how social science theories can inform intragovernmental coordination efforts for health highlight political economy analysis as one of the key approaches to understand politically feasible solutions that consider power hierarchies within a given system (109).

Positionality and Research Collaboration Model

I am a citizen of Sri Lanka, an LMIC, and have conducted global health governance and policy research for the last eight years. Prior to entering the global health policy field, I have experience in working in human rights policy and humanitarian work in South Asia. I also have experience in conducting molecular biology medical research at Johns Hopkins University. As my doctoral research study was conducted as a student in a high-income country institute, I used best practices outlined by the Canadian Institute of Health Research (CIHR), principles for global health research by Canadian Coalition for Global Health Research (CCGHR) and other best practices outlined by scholars and organizations to avoid harmful power hierarchical models and to ensure equity in research (110,111). Six principles outlined in CCGHR include authentic partnering,

inclusion, shared benefits, commitment to the future, and responsiveness to causes of inequities and humility (111). In addressing causes of inequities as per CCGHR guidance, I first considered power differentials among stakeholders. Therefore, this research, in its qualitative component included a variety of stakeholder perspectives including government, farmer unions, industry and so on. Second, aware of the power differential between HIC and LMIC researchers, I have been intentional in incorporating views from our partners in Marondera Agricultural University and Training and Research Support Center in Harare, when designing the research, selecting participants, conducting interviews, analyses preparation, analyses review and manuscript review. Additional guidance sources included but were not limited to Hyder et al.'s *"The ethics of health systems research in low and middle-income countries: A call to action,"* Wellcome Trust's *"Ethical sharing of health research data in low- and middle-income countries: views of research stakeholders"* and *"Country ownership in global health"* by Abdisalam M. Noor (112–114). I employed principles highlighted in these guidance documents to ensure equitable partnership building, data sharing, research design and implementation.

The research collaboration model based on ethical guidance of CIHR, and the National Institutes of Health (NIH) was already established within the existing larger research team who have conducted similar research in countries such as Kenya, Malawi, Indonesia, Mozambique and Zimbabwe. The guidance and consultation were used at every stage of research implementation of this study. I used routine meetings to collaboratively plan data collection, finalize questionnaires, share drafts of manuscripts and other outputs such as policy briefs for collaborative editing. Our diverse and global

team was also used as a resource to gain input on research design, implementation and to identify any shortcomings. The current global team includes experts from both HICs (United States and Canada) and LMICs (Malawi, Mozambique, Indonesia, Kenya, Zambia, Zimbabwe) they provided input from the research design stage to implementation and on knowledge sharing. We had routine meetings scheduled every two months and increased our meeting frequencies leading up to and during data collection. Additionally, we held an in-person all team member meeting in January 2023 in Cape Town, South Africa to strategize on research outputs and data collection efforts, including data collection in Zimbabwe. We have shared authorship in an equitable and transparent manner in consultation with country partner leads and research assistants. For authorship allocation we used International Committee of Medical Journal Editors (ICMJE) recommendations as general principles and the guidance of the submission journals for each manuscript (115).

Furthermore, I used my lived experiences, prior research experiences in partnership building and engaging with policy makers and stakeholders from non-high-income countries to further strengthen my research and advocacy approach. I also used the latest critiques of analytical approaches such as challenges around casually using the term LMICs by Lencucha et al. or using harmful framing of LMICs built on colonial models by Khan et al. to guide my writing (59,116). We did not use Sub-Saharan Africa based on relevant critiques highlighting the colonial roots and racist implications of the term and instead used WHO African region (referred to as African region in this dissertation) (117,118).

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Chapter 5: Manuscript One - Contextual factors impacting WHO Framework Convention of Tobacco Control Implementation in Africa – a scoping review

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Shashika Bandara and Raphael Lencucha conceptualized this project with Shashika Bandara, Raphael Lencucha, Jeffrey Drope, Mattew Hunt, Alayne Adams contributing to the designing of the study. Shashika Bandara and Raphael Lencucha conducted the initial analysis, and all authors contributed to the analysis or interpretation of data. Shashika Bandara wrote the first draft and subsequent drafts with critical input from all authors via multiple rounds of editing adding relevant important intellectual content. All authors approved the final version to be published and have agreed to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

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Abstract

According to the World Health Organization (WHO), tobacco use causes over 8 million deaths annually including 1.3 million due to secondhand exposure. Further, data from the Tobacco Atlas shows that the tobacco industry continues to target new markets in the WHO African region, one of two regions where absolute numbers of smokers continue to increase. Understanding context contributes to policy formulation and implementation ensuring relevance to a country's political economy. Focusing on the WHO African region, this scoping review a) maps the extent of academic research examining contextual factors on the WHO FCTC national level implementation, and b) reports on contextual factors impacting the WHO FCTC implementation. Using a stepwise structured approach, we conducted a search across 4 academic databases, yielding 10,342 articles and 42 were selected for full data extraction. Leichter's four categories of context (situational, structural, cultural, and exogenous) and the stages heuristic policy model guided data extraction. Study findings indicated that situational contextual factors such as burden of disease or impact on health can push governments toward policy formulation. Structural contextual factors included political considerations, economic interests, funding, institutional congruence, strength of policy, and institutional capacity as important. Cultural contextual factors included the influence of policy entrepreneurs, current social trends, and public opinion. Exogenous contextual factors included the WHO FCTC, tobacco industry influence at the national level and bi-lateral partnerships. Further understanding contextual factors affecting the WHO FCTC national implementation can strengthen policy formulation and align required support with the WHO FCTC Secretariat and other relevant bodies.

Contribution to Health Promotion:

1. Contextual factors (situational, structural, cultural and exogenous) have played a significant role in policy formulation, legitimation, implementation, and evaluation in countries included in this review.
2. Structural contextual factors such as economic structure and political system were found to be the most commonly identified contextual factors shaping WHO FCTC implementation.
3. Ratification of the WHO FCTC was highlighted as a key exogenous contextual factor to advance in country tobacco control policies. However, transnational tobacco companies and bilateral aid remain key policy influencers.
4. Review findings can inform policy research on tobacco control with implications towards WHO FCTC implementation strengthening.

Introduction:

According to World Health Organization (WHO), tobacco use causes over 8 million deaths each year including 1.3 million due to second-hand exposure (Reitsma *et al.*, 2021; World Health Organization, 2023a). While there has been a decrease in the prevalence of tobacco use from 22.7% in 2007 to 19.6% in 2019, the total number of tobacco users remains high (Drope *et al.*, 2022). Over 80% of the world's 1.3 billion tobacco users – including smokers and those who use smokeless tobacco - live in low and middle income countries (LMICs) (Reitsma *et al.*, 2021; World Health Organization, 2023a). In addition to the harms of consumption, tobacco farming causes significant environmental and societal damage due to deforestation, child labour and multiple

health hazards associated with tobacco leaf growing and processing (Leppan, Lecours and Buckles, 2014). A recent study found an increase in tobacco use among youth in 63 of the 135 countries surveyed and highlights that the tobacco industry continues to target new markets in the WHO African region (referred to as African region from here on) (Drope *et al.*, 2022). The African region is one of two WHO regions that continue to see absolute numbers of smokers increase (Drope *et al.*, 2022).

To stem the global impact of the tobacco epidemic, the WHO Framework Convention of Tobacco Control (WHO FCTC) was adopted by the World Health Assembly in 2003, and came into force two years later (World Health Organization, 2005; Chung-Hall *et al.*, 2019a). WHO FCTC is a legally binding global health treaty that requires acceding countries to implement measures outlined in the treaty for supply and demand reduction of tobacco (World Health Organization, 2005; Chung-Hall *et al.*, 2019a). As of February 2024, 183 Parties out of 193 have either ratified or acceded to the WHO FCTC (United Nations, 2023). The provisions of the WHO FCTC cover both demand reduction (reduction of consumption,) and supply reduction (reduction of tobacco growing and tobacco product manufacturing) measures (World Health Organization, 2005). Early estimates suggested that without substantial advancement in WHO FCTC implementation, an estimated 1 billion people are expected to die from tobacco-related deaths in the 21st century (Jha *et al.*, 2006). The impact report of the first decade of the WHO FCTC implementation, *WHO Report on the Global Tobacco Epidemic, 2021* and more recent analysis of the WHO FCTC country level impact highlight the positive impact that WHO FCTC implementation has had globally in reducing tobacco use and the corresponding need to strengthen implementation efforts in LMICs (Chung-Hall *et*

al., 2019a; World Health Organization, 2021b; Paraje *et al.*, 2024). The Global Strategy to Accelerate Tobacco Control 2019-25 also notes the need to strengthen WHO FCTC implementation strategies (World Health Organization, 2019).

We have operationalized 'implementation of WHO FCTC' as national level development and enforcement of policies based on WHO FCTC commitments.

Comprehensive implementation of the WHO FCTC in the African region is particularly urgent as many have suggested that the continent is the next epicentre of the tobacco epidemic (Blecher and Ross, 2013; Egbe *et al.*, 2022; Worth, 2023). Of the 47 countries in the WHO AFRO region (one of six WHO regions and focused on the African continent), 45 have either ratified or acceded to the WHO FCTC (United Nations, 2023; World Health Organization, 2023b). The most recent signee to the convention was Malawi in August 2023. The African region remains of high interest to the tobacco industry due to its youthful population, economic promise, expected population growth and the fledging state of tobacco control measures in many countries (Vellios, Ross and Perucic, 2018; Egbe *et al.*, 2022; World Bank, 2023). Unregulated markets, weak policies or strong policies with weak policy enforcement, are some of the challenges that require attention in the region (Vellios, Ross and Perucic, 2018; Egbe *et al.*, 2022). Many of the top tobacco growing countries are located in the region, creating conflicts of interest within governments where tobacco is viewed as an important economic commodity (Lown, McDaniel and Malone, 2016; Lencucha *et al.*, 2018; Smith and Lee, 2018; Fang *et al.*, 2020).

Recognizing the urgency and importance of comprehensive implementation of the WHO FCTC, it is crucial to strengthen policy environments and support actors in tobacco control especially at the national level. The WHO FCTC implementation requires a national government mandate, resource allocation, inter-ministry cooperation and coordination, public awareness building, collaboration with non-governmental organizations, mechanisms to counter tobacco industry influence and many other factors which vary by country context (World Health Organization, 2021a). Bump et al., point out that comprehensive tobacco control implementation in LMICs demands an understanding of the political economy at the country level (Bump and Reich, 2013). Macro-economic changes (e.g., recession, country-level debt, new trade agreement), institutional culture (e.g., mandates that favour free market principles over social protection), relationships with state and non-state actors (e.g., viewing industry as a legitimate stakeholder), resource availability (e.g., budget allocations for policy implementation), organizational capacity (e.g. human resources and technical capacity) are realities that need to be taken into account (INASP and Politics and Ideas, 2016). These factors all inform an understanding of the context of policy implementation (Daniels, 2018; Browne *et al.*, 2019). Given the importance of context in shaping research on and implementation of the WHO FCTC implementation, a critical examination of how context of the WHO FCTC implementation is researched, what contextual factors have been found to shape implementation and what further research and conceptual development is needed (Wisdom *et al.*, 2018; Egbe *et al.*, 2022).

In this review, we consider the published academic literature on the WHO FCTC implementation in the African region with a focus on contextual factors impacting

implementation. We examine contextual factors influencing policy formulation, enforcement, and evaluation at the national level, with a view to informing the direction of future research and strengthening the WHO FCTC implementation. This scoping review first maps the extent of academic research examining contextual factors on the WHO FCTC implementation at the national level and then synthesizes and collates the data relevant to the WHO FCTC implementation in the African region.

Methods:

Scoping reviews are a form of systematic knowledge synthesis which involve the comprehensive search, collation, and analysis of available literature on a specific topic. They aim to identify and map the available evidence, with the purpose of informing practice, programs, and policy and/or providing direction to future research priorities (Pham et al., 2014). We used a scoping review, as opposed to a systematic review, as our goal was to map a broad range of academic literature and identify the topics addressed in the research on context. We did not aim to assess the quality of evidence or answer a more targeted question on WHO FCTC implementation. Therefore, scoping review was the best fit for this research to examine the broad range of literature on our selected topic, while ensuring rigor in the search and analysis process (Munn *et al.*, 2018). We used scoping review methods to identify the published literature on how context is considered in tobacco control research in the African region. We employed the enhanced scoping review stepwise methodological framework of Levac, Colquhoun, and O'Brien which builds upon the earlier framework of Arksey and O'Malley (Arksey and O'Malley, 2005; Levac, Colquhoun and O'Brien, 2010). Based on this framework,

we follow five steps in our review: 1) Identifying the research question, 2) Identifying the relevant studies, 3) Study selection, 4) Charting the data, 5) Collating, summarizing and reporting the results. Levac et al., provide further recommendations related to data extraction and data collation and reporting stages. First, as advised by Levac et al., two authors reviewed the first five publications to establish consensus before moving on to full data extraction. Second we divided our data reporting to descriptive statistics and qualitative analysis-based reporting (Levac, Colquhoun and O'Brien, 2010). To guide our review, we drew on Leichter's four categories of context and the stages heuristic policy model (Collins, Green and Hunter, 1999; Walt et al., 2008; Kent, Nicholas and Gill, 2012).

Conceptual model and framework

Context is a broad term and can be defined in different ways (Collins, Green and Hunter, 1999; Kent, Nicholas and Gill, 2012). In this review, we employ Leichter's framework which conceptualizes policy context into four distinct categories (Supplementary File 1): i) situational factors that impact policy such as pandemics or natural disasters, ii) structural factors stemming from economic factors, governance or institutional norms, iii) cultural factors rooted in social norms and socio-economic conditions, and iv) exogenous factors such as global health treaties, multinational industry influence or bi-lateral agreements (Leichter, 1979; Kent, Nicholas and Gill, 2012).

Given our focus on policy implementation in countries following the ratification of the WHO FCTC, we also reference the cyclical stages heuristic model initially introduced by Lasswell in 1956 and adopted and adapted by health policy researchers (Walt *et al.*,

2008; McCarthy-Cotter, 2019). This model has five stages including agenda setting (getting the relevant topic on the government agenda), policy formulation (formulation of relevant tobacco control policies using WHO FCTC guidance), legitimation (gaining support from relevant actors, especially policy makers), implementation (enforcing the policies formulated via relevant institutions), and evaluation (evaluating the performance of policies) (Walt *et al.*, 2008; McCarthy-Cotter, 2019). We used this model to examine how context applies to each stage of the cycle when implementing the WHO FCTC guidance in countries that have ratified the treaty. Together, Leichter's context framework and the stages heuristic policy model provide helpful conceptual guidance in examining national-level implementation of the WHO post-ratification, usefully informing all stages of analysis, including coding, data collation, interpretation, and reporting.

Identifying the research question

The WHO FCTC implementation needs strengthening in LMICs and understanding context has strong relevance to improving policy implementation (Chung-Hall *et al.*, 2019b). We narrowed our focus to the African region given the increasing number of tobacco users in the region and the industry's corresponding interest in the region as an emerging market (Adebiyi and Oluwafemi, 2017; Lencucha *et al.*, 2022). Focusing on the African region and understanding the context can support goals such as improving institutional cooperation in the region, priority setting within funding organizations and identifying and applying lessons learned among countries that are acceding to the convention (Egbe *et al.*, 2022). Thus, for this review we pursue the question, what contextual factors have been examined in academic research on the WHO FCTC implementation in the African region? As noted in the introduction, under this research

question, we examine research on contextual factors and their association with policy processes related to WHO FCTC.

Search strategy

For this review, we used Scopus, Web of Science, PubMed, and Europe PMC databases with the goal of covering a wide range of relevant academic disciplines. Europe PMC was specifically included as it captures pre-prints from multiple other pre-print servers, making our search more comprehensive (Europe PMC, 2018). We developed a comprehensive research strategy with the support of experts from the library of the first author's (SB) current institution that aimed to include national, regional, and global level studies, with a special focus on countries from the African region. Finalized through an iterative process, search terms focused on the following areas: context, tobacco control, WHO FCTC, implementation. Implementation within this review was operationalized as national level policy implementation of the WHO FCTC inclusive of stages of the policy model. In addition, references of selected publications were searched for relevant additional publications to be included in the scoping review. Supplementary File 2 provides a compilation of search strings with specific search terms and Boolean operators categorized by each database.

Selecting relevant studies

Two authors (SB and RL) initially screened titles and abstracts of 100 articles out of 4760 to establish consensus on article selection based on inclusion and exclusion criteria (Table 1). We set a target of at least 90% agreement during blind screening. In our 100 articles, we had over 95% agreement. Once consensus was established SB

screened the remaining articles for study selection. During the screening process, we (SB and RL), had routine meetings to ensure adherence to inclusion and exclusion criteria. Inclusion criteria were articles that were pre-print or published in peer-reviewed journals that focused on implementation of the WHO FCTC at the national or sub-national level including the stages of agenda setting, policy formulation, policy legitimation, policy implementation/ enforcement, and evaluation. The starting date for inclusion was set for January 1, 2004, one year before the WHO FCTC came into force, and our search end date was October 25, 2022. We conducted the search and extracted search results on October 26, 2022. Since the initial deadline to sign on to the WHO FCTC was June 29,2004, we used January 1, 2004 (the beginning of the year), to ensure we did not miss any relevant articles. We excluded articles that did not discuss contextual factors such as prevalence studies that only reported the quantitative findings without connecting them to contextual factors. For title and abstract screening, we used Rayyan online tool and selected articles were included in an excel table. From this table, we conducted full text screening for studies that needed more in-depth review to select the final set of studies for data extraction.

Table 1: Inclusion and exclusion criteria for the scoping review

Inclusion Criteria	**Exclusion Criteria**
I. Include only academic articles that incorporate primary and secondary data analysis – including peer reviewed, and pre-prints.	I. Exclude non-academic articles.
	II. Exclude commentaries and opinion articles.
II. Include articles only from January 1, 2004 – October 25, 2022	III. Exclude books or book sections or conference articles.
III. Include articles focusing on WHO FCTC implementation and tobacco control measures at the national or sub-national level.	IV. Exclude articles prior to January 1, 2004, and after October 25, 2022.

IV. WHO FCTC implementation will include policy cycle stages of stages heuristic model starting from policy formulation to policy evaluation. V. Include articles that focus on the African region with national level examples or global level analyses that specifically include countries from the African region.	V. Exclude countries that have not ratified the WHO FCTC by October 25, 2022 VI. Exclude articles that do not focus on WHO FCTC implementation or tobacco control efforts. VII. Exclude studies that do not focus on contextual factors related to WHO FCTC implementation or tobacco control. (e.g., prevalence studies) VIII. Exclude articles that do not focus on the African region or global level analyses including countries from the African region.

Data extraction

The first author (SB) created the initial data extraction table and incorporated team feedback to improve and finalize the table. RL and SB then conducted data extraction on five publications to establish consensus. In addition to descriptive data such as authors, date, and title, the data extraction table was designed to extract and collate data from each study related to each contextual factor (situational, structural, cultural, and exogenous) and categorized each study under relevant policy stage(s) of the stages heuristic policy model.

Analysis and reporting of results

We conducted two levels of analysis. First, we conducted a descriptive analysis to categorize the publications by geographic focus, what contextual categories the data belonged to in each publication and which policy cycle stage(s) each publication addresses. Second, we conducted inductive thematic analysis within the four contextual

categories. In this analysis, we coded the extracted data and identified common themes applicable to all countries with specific examples from different countries. We report these examples in the results section to illustrate how contextual factors were integrated into the study findings on policy processes. Finally, we identified the stage of the policy cycle addressed in the publication.

After conducting the search across four databases, we generated an initial list of 10,342 articles. From this initial list, we removed 5582 duplicate articles and identified 4760 articles for screening. After the title and abstract screening, we finalized 50 articles for full text screening. Following full text screening we selected 42 articles for extraction. The screening process is illustrated in the Supplementary File 3.

Results:

Descriptive results of the included publications

Based on our analysis of the geographic distribution of publications, the largest number of academic publications focused on Kenya (n=11), followed by South Africa (n=5), then Ghana, Nigeria, Ethiopia, Uganda and Mauritius, all with four publications each. Other countries represented within this review include Zambia (n=3), The Gambia (n=2), Madagascar (n=2), Cameroon (n=2), Togo (n=2), Namibia (n=1), Senegal (n=1), Zimbabwe (n=1). There are also publications focused on the African region (n=6) and the West African region (n=1) (Supplementary File 4).

Our analysis identified one or more contextual factors in each of the publications. As individual publications had content related to more than one contextual category and policy cycle stage, the total number of contextual categories or policy cycle stage

represented exceeds the total number of publications included (Supplementary File 5). The *structural contextual factor* had the highest frequency across included publications, figuring in 39 of the 42 articles reviewed. Situational contextual factor (6) had the lowest. Cultural and exogenous had 20 and 26 publications respectively. *Policy implementation stage* had the highest frequency with 36 publications referring to it. Policy formulation, legitimation and evaluation had 15, 18 and 11 publication references respectively.

Qualitative analysis results of contextual factors

We report the qualitative results using Leichter's four categories.

Situational contextual factors

Situational factors refer to acute, less repetitive, factors that impact policy and policy environments including armed conflict, epidemics or pandemics, natural disasters, and similar events (Kent, Nicholas and Gill, 2012)**.** Across the reviewed publications, situational factors were found to be the least frequently referenced factor in relation to the implementation of the WHO FCTC. Examples of situational factors identified included high level disease burden due to tobacco use or increasing trends in tobacco use and political instability impacting agenda setting, policy formulation, legitimation and implementation (Patterson and Gill, 2019; Habebo and Takian, 2020; Singh *et al.*, 2020; Egbe *et al.*, 2022). Of particular note was recognition that despite the comparatively low prevalence of tobacco in the region, the trend of increasing tobacco use is a situational factor that is relevant to the WHO FCTC implementation (Patterson and Gill, 2019; Egbe *et al.*, 2022). For example, one study noted that in Nigeria, the steady increase of tobacco-related illness prompted eight states and the federal

government to file lawsuits against British American Tobacco Nigeria (BATN) (Udokanma, Ogamba and Ilo, 2021). Another study on Kenya noted that increased tobacco use was recognized by the public as a health challenge and by stakeholders within the health ministry as both a public health and environmental challenge (Mohamed *et al.*, 2018). Additionally, one study conducted in Ethiopia, found that the volatile political climate caused impediments to policy implementation even when national level policies for tobacco control were in place (Habebo and Takian, 2020).

Structural contextual factors

Structural contextual factors include more permanent elements of society such as economic structure, political system, degree of urbanization, and demographic structure (Kent, Nicholas and Gill, 2012). Based on our analysis 39 studies referred to structural factors in their analysis of the WHO FCTC implementation (Supplementary File 5). We organized the analysis of the structural factors under six sub-themes: political, economic, institutional capacity, funding, strength of policy and institutional coherence.

Political

At the national level, policy formulation processes were attributed to political contextual factors. For example, the passing of Nigeria's tobacco control act required political support to finally be enacted in 2015 (Udokanma, Ogamba and Ilo, 2021). Delays by the then president in signing the bill, public opposition by political stakeholders to the bill and internal divisions among stakeholders were significant political structural factors that were identified as challenges (Adebiyi and Oluwafemi, 2017; Udokanma, Ogamba and Ilo, 2021). Ghana, being one of the first five countries to become party to the

Convention in 2004, re-drafted the existing tobacco control Bill in 2005 despite initial delays and passed a comprehensive tobacco control law in 2012 (Owusu-Dabo *et al.*, 2010; Singh *et al.*, 2020). In 2018, Ghana also strengthened its tobacco control law with pictorial warnings on packaging (Owusu-Dabo *et al.*, 2010; Singh *et al.*, 2020). Multiple ministries including health, education, and transport issued directives to ensure adherence with guidelines outlined in the WHO FCTC soon after ratification (Singh *et al.*, 2020). Despite initial delays, strong political will was cited as a key impetus by stakeholders in getting a comprehensive tobacco control bill passed in Ghana (Singh *et al.*, 2020). Other examples include studies that attributed political alignment and support to successes in countries such as Senegal, Namibia, Kenya where comprehensive policy instruments reflecting the WHO FCTC were formulated and enacted (Tam and van Walbeek, 2014; Mohamed *et al.*, 2018; Sagna *et al.*, 2022). In South Africa, the African National Congress framed the harms from tobacco use as a racial-equity issue in efforts to strengthen the political will to counter pro-tobacco lobbying (Wisdom *et al.*, 2018). Mauritius also stands out in the region as a country where the government's full commitment was cited as a key factor in formulating national policies to implement the WHO FCTC (Kusi-Ampofo, 2021).

Economic

Prioritization of tobacco as an economic commodity in public policy and government institutions is another structural factor that was found to impact policy formulation, enactment and implementation (Lencucha *et al.*, 2016; Lencucha, Magati and Drope, 2016; Erku and Tesfaye, 2019; Egbe *et al.*, 2022). For example, countries such as Zambia and Ethiopia were found to have economic interests that clashed with

implementation of the WHO FCTC (Lencucha *et al.*, 2016; Ralston *et al.*, 2022). This clash resulted in delays to enacting comprehensive tobacco control policy and the adoption of policies with loopholes that negatively affected implementation (Lencucha *et al.*, 2016; Habebo and Takian, 2020; Ralston *et al.*, 2022; Kaai *et al.*, 2023). In Zambia's case, government investment in promoting tobacco as an economic commodity and in Ethiopia's case, its state-owned tobacco industry monopoly, which was later privatized, were identified as factors shaping its approach to tobacco control (Lencucha *et al.*, 2016; Ralston *et al.*, 2022). Other examples include countries such as Cameroon and Zimbabwe where economic contextual factors were found to impact comprehensive whole-of-government policy enactment to implement the WHO FCTC (Mapa-Tassou *et al.*, 2018; Egbe *et al.*, 2022).

Institutional Capacity

Institutional capacity, both in terms of human resources and technical knowledge, remains a key structural contextual factor that impacts policy formulation, policy implementation and evaluation (Owusu-Dabo *et al.*, 2010; Tam and van Walbeek, 2014; Mohamed *et al.*, 2018; Jallow, Britton and Langley, 2019). In Namibia, lack of legal expertise and staff capacity significantly impacted policy formulation processes within government (Tam and van Walbeek, 2014). One study suggested that Namibia struggled to implement the 2010 Tobacco Products Control Act due to insufficient staff and legal capacity and tobacco control not being the primary priority of staff (Tam and van Walbeek, 2014). Insufficient legal knowledge among ministry officials was also reported as a factor that led to situations in which the ministry officials were vulnerable to being misled by industry (Tam and van Walbeek, 2014). In countries such as Ghana,

Gambia and Kenya, studies attributed lack of human resource capacity to challenges in sustaining implementation of national tobacco control policies, including advocating for amendment processes when required (Owusu-Dabo *et al.*, 2010; Mohamed *et al.*, 2018; Jallow, Britton and Langley, 2019; Singh *et al.*, 2020). Furthermore, in Ethiopia and Uganda, studies identified lack of awareness among government officials outside of the Ministry of Health about tobacco control legislature and the WHO FCTC as a factor that hampered whole of government implementation efforts, especially in relation to minimizing industry interference (Hirpa *et al.*, 2022; Male *et al.*, 2022; Ralston *et al.*, 2022).

Funding

Lack of funding for government policy implementing bodies is cited by many studies as a factor limiting institutional efforts in formulating and implementing the national level tobacco control policies (Lencucha *et al.*, 2016; Lencucha, Magati and Drope, 2016; Adebiyi and Oluwafemi, 2017; Mohamed *et al.*, 2018; Singh *et al.*, 2020). In Kenya, lack of funding was cited as a contributing factor for slow formulation of polices and the country had to rely on external funding to move policy formulation processes forward (Mohamed *et al.*, 2018). In Zambia, studies indicate that stakeholders considered lack of funding to be a major factor impacting the approval of tobacco control legislature as tobacco control was not initially a priority within the health ministry (Lencucha *et al.*, 2016).

Lack of funding allocation stemming from poor leadership was noted as the cause of Nigeria's weak performance in implementing Article 12 of the WHO FCTC (Adebiyi and

Oluwafemi, 2017). In Kenya, lack of funding resulted in operational challenges for government entities including the tobacco control board tasked with implementing and enforcing tobacco control policies (Lencucha, Magati and Drope, 2016; Mohamed *et al.*, 2018). In Zambia, it was suggested that lack of funding has affected the promotion of alternative crops for tobacco farmers (Lencucha *et al.*, 2016).

Strength of policy

The strength and comprehensiveness of policy were found to be key factors when implementing the WHO FCTC. In Ghana, for example, until a comprehensive bill focusing on tobacco control was passed, there were implementation challenges despite having directives supporting the WHO FCTC implementation (Owusu-Dabo *et al.*, 2010). Even passing legislation supporting the implementation of the WHO FCTC has been challenging as evidenced by the struggles in countries such as Kenya and Nigeria (Mohamed *et al.*, 2018; Udokanma, Ogamba and Ilo, 2021).

In other instances, even though tobacco control laws were passed, various loopholes hindered implementation. In Ethiopia and Uganda, adaptation of Article 5.3 of the WHO FCTC (which focuses on managing industry interference) lacked adequate detailed policy tools for effective implementation (Ralston *et al.*, 2022). With respect to adaptation of Article 8 of the WHO FCTC related to smoke-free public places policy guidance, research indicates only 6 out of the 47 African region countries (Burkina Faso, Chad, Congo, Madagascar, Namibia, and Seychelles) had enacted national policies or had subnational laws protecting at least 90% of the population by 2015 (Husain, English and Ramanandraibe, 2016). It is important to note that many countries,

even those with comprehensive tobacco control policies, struggle to implement or enforce them due to structural contextual factors such as lack of institutional congruence, institutional capacity and resource availability (Egbe *et al.*, 2022; Lencucha *et al.*, 2022). Encouragingly, there are examples of how policy-focused research and evaluation have been influential in shaping policy reforms that address structural factors related to tobacco control. For example, at the Conference of Parties of the WHO FCTC in 2012, the government of Mauritius cited data from the study *Investigating the effectiveness of pictorial health warnings in Mauritius: findings from the ITC Mauritius survey* by Green et al. as a reason to accelerate the revision of their pictorial health warnings (Green *et al.*, 2014).

Institutional coherence

Institutional coherence is dependent on the cohesiveness of actors within institutions. For example, poor coordination between different Ministry of Health entities in Kenya (e.g., NCD division, Office of the Chief Public Health Officer and Kenya Tobacco Control Board) was an important cause of implementation delays (Lencucha, Magati and Drope, 2016; Mohamed *et al.*, 2018). In Nigeria, lack of political will was found to influence institutional coherence and whole of government approaches including delays in issuing policy announcements (Udokanma, Ogamba and Ilo, 2021). In Kenya, despite coordination challenges, strong political will has been cited as a key factor in resolving challenges faced in implementing the national tobacco control policies led by the Ministry of Health (Mohamed *et al.*, 2018). In countries such as Ethiopia, Zambia and Cameroon, tobacco control implementation has also been found to be affected by lack of coordination and tensions between ministry priorities due to tobacco being a revenue

source (Lencucha *et al.*, 2016; Mapa-Tassou *et al.*, 2018; Erku and Tesfaye, 2019; Habebo and Takian, 2020; Hirpa *et al.*, 2022).

Cultural Contextual Factors

Cultural contextual factors include socio-cultural norms, religious values and community participation (Kent, Nicholas and Gill, 2012). In relation to tobacco, the cultural context has been historically heavily influenced by the tobacco industry and related economic interests. This is largely why tobacco promotion, and sponsorship bans have been such an important feature of the WHO FCTC. Within this review we observed cultural contextual factors manifested in the use of media and prominent figures influencing institutional culture and shape public opinion. Studies found that media influenced prevailing culture via advancing the messages of policy entrepreneurs, as well as influencing societal norms and values relevant to tobacco control (Mohamed *et al.*, 2018; Habebo and Takian, 2020; Udokanma, Ogamba and Ilo, 2021). Moved by a visit to a children's cancer ward, the First Lady of Kenya's efforts to shift the culture on the WHO FCTC implementation at the highest levels of government is an example of a policy entrepreneur in action to affect institutional culture and sway public opinion (Mohamed *et al.*, 2018). In Ethiopia, long standing tobacco smoking practices in rural areas and smoking as a modern lifestyle practice among youth, are identified as socio-cultural factors impacting tobacco control implementation (Habebo and Takian, 2020). In Nigeria, studies suggest that had there been strong public pressure to pass the national bill on tobacco control, it would have sped up the President's signing of the bill (Udokanma, Ogamba and Ilo, 2021). Rather, public engagement was found to be weak as the public awareness campaign was only initiated during policy implementation

affecting overall societal socio-cultural awareness (Udokanma, Ogamba and Ilo, 2021). Restriction of tobacco industry's corporate social responsibility projects has also positively impacted media coverage of those activities in countries such as Botswana, Liberia, Gambia and Mauritius which in turn impact public opinion and social norms (McDaniel, Cadman and Malone, 2018). In addition to these cultural contextual factors, fabricated narratives, such as the lucrative nature of tobacco farming, also impact communities. For example, in Kenya, despite dismal profits and awareness building on harms on tobacco farming, the narrative that tobacco farming is economically beneficial persisted. This narrative has largely been based on anecdotal evidence perpetuated by the tobacco industry, creating social norms and beliefs that create an unrealistic image of tobacco farming (Clark *et al.*, 2020).

Exogenous Contextual Factors

Exogenous factors are factors from outside of the country influencing tobacco control such as the role of transnational companies, international agreements and other countries (Kent, Nicholas and Gill, 2012). The main exogenous contextual factors identified within this review are tobacco industry interference, the impact of the WHO FCTC, and impact of other countries as development partners (Tumwine, 2011; Egbe, Bialous and Glantz, 2019; Zaatari and Bazzi, 2019; Fang *et al.*, 2020; Hirpa *et al.*, 2022; Ralston *et al.*, 2022). In Nigeria, industry arm BATN played a significant role in delaying and interfering with the passing of tobacco control legislature (Udokanma, Ogamba and Ilo, 2021). A key factor in industry interference in countries such as Kenya relates to their financial power over tobacco stakeholders, making it difficult to resist industry interference (Mohamed *et al.*, 2018). Nigeria and Kenya, however, are not standalone

examples. Industry interference remains a significant exogenous factor affecting the region while the shifting of attention of transnational companies to the African region as a new market for tobacco has been a deliberate strategy (Adebiyi and Oluwafemi, 2017).

The WHO FCTC as an international treaty has been found to be a key exogenous force in countering industry interference and a support to building government capacity to formulate, enact, implement and evaluate tobacco control policies at the national and sub-national levels (Tumwine, 2011; Lencucha *et al.*, 2016; Erku and Tesfaye, 2019; Singh *et al.*, 2020; Udokanma, Ogamba and Ilo, 2021; Egbe *et al.*, 2022). Across the African region, governments have been persuaded, and at times pressured, to implement the WHO FCTC guidance at the national level (Adebiyi and Oluwafemi, 2017; Mohamed *et al.*, 2018; Egbe, Bialous and Glantz, 2019; Singh *et al.*, 2020; Egbe *et al.*, 2022). The WHO FCTC guidance related to taxation, minimizing industry interference, and creating a smoking free environment have been instrumental at the national level for all countries in the region including Kenya, Nigeria, Gambia, Mauritius, Uganda, Namibia, both in terms of capacity building and creating legislature (Adebiyi and Oluwafemi, 2017; Mohamed *et al.*, 2018; Erku and Tesfaye, 2019; Jallow, Britton and Langley, 2019; Singh *et al.*, 2020; Ralston *et al.*, 2022; Kaai *et al.*, 2023).

Bi-lateral development partnerships are another exogenous factor that has impacted tobacco control in the African region in countries such as Zimbabwe and Ethiopia (Fang *et al.*, 2020; Habebo and Takian, 2020). In Zimbabwe, China has played a crucial role in sustaining tobacco farming with bilateral assistance for tobacco farming through companies such as Tian Ze Tobacco Company, a subsidiary of China National Tobacco

Corporation (Fang *et al.*, 2020). China's support was found to be a major factor in helping Zimbabwe recover a declining tobacco industry in the early 2000s, contributing to China's effort to establish itself as an "all weather friend" (Fang *et al.*, 2020). Ethiopia sold a controlling stake of its state-owned tobacco industry to Japan Tobacco International (JTI), a company in which the Japanese government has a controlling stake (Hirpa *et al.*, 2022). JTI asserted Ethiopia to be an "important expansion of our geographic footprint in emerging markets" citing economic growth of Ethiopia as an encouraging factor (Hirpa *et al.*, 2022).

Discussion:

This review has examined the contextual factors that have a bearing on tobacco control policy in the African region, from formulation to evaluation. Diving deeper into how contextual factors have affected policy processes is critical to strengthening ongoing and proactive research and policy action in the region (Chung-Hall *et al.*, 2019a; World Health Organization, 2021b; Egbe *et al.*, 2022).

Based on the findings of this review, three key observations warrant discussion. First, studies suggest that situational factors such as rising burden of NCDs or cancer and higher rates of active TB among tobacco smokers can serve as an entry point for policy formulation, processes including advocacy (Juma *et al.*, 2018; Chidumwa *et al.*, 2023). These factors can serve to effectively leverage cultural contextual factors (e.g., public opinion, media coverage, policy entrepreneurs) to catalyse implementation. Examples include the contention that the Nigerian president would have passed the tobacco control bill had there been more influence from the public (Egbe, Bialous and Glantz,

2019; Udokanma, Ogamba and Ilo, 2021). By contrast in Kenya, public awareness regarding the consequences of tobacco use, and the First Lady's role as a policy entrepreneur, helped expedite the enactment of tobacco control legislation (Adebiyi and Oluwafemi, 2017; Mohamed *et al.*, 2018). Especially, using the rising burden of disease as a catalytic point for policy change requires effective monitoring of tobacco use or cost of tobacco use at the national level using prevalence studies and economic evaluations then connecting such data to media outlets and policy dialogs at the national level (Patterson and Gill, 2019). While the WHO has already recognized the need for such monitoring by implementing MPOWER measures, continued strengthening is needed at the national level (Wisdom *et al.*, 2018). These measures include monitoring tobacco consumption and the effectiveness of preventive measures, protecting people from tobacco smoke, offering help to quit tobacco use, warn about the dangers of tobacco, enforce bans on tobacco advertising, promotion, and sponsorship and raise taxes on tobacco (World Health Organization, 2023c). This need for national level strengthening of evidence-informed advocacy is an important observation relevant to research funders as well. Therefore, funders need to be cognizant and invest in long-term tobacco control research focused on strengthening community understanding, avoid rapid strategic shifts related to funding, and avoid setting unrealistic outcomes to measure project success such as requiring rapid legislative change (Mohamed *et al.*, 2018; Jallow, Britton and Langley, 2019; Patterson and Gill, 2019). For funders it is essential to have a long-term approach that can provide resources to communities and strengthen advocacy.

A second observation is that structural contextual factors are the most commonly researched and/or identified category of factors shaping WHO FCTC implementation. An interconnected observation is the strong underlying impact of political determinants and institutional coherence on these factors (Adebiyi and Oluwafemi, 2017; Singh *et al.*, 2020; Udokanma, Ogamba and Ilo, 2021; Egbe *et al.*, 2022). Expanding research that focuses on political determinants within policy processes can generate a deeper understanding of practices that other countries can learn from, especially within the region. As noted, it will also be important to understand the management of policy priorities in contexts where tobacco farming is considered an important source of revenue (Lencucha, Magati and Drope, 2016; Fang *et al.*, 2020; Lencucha *et al.*, 2022).

Third, while tobacco industry interference has been well documented and examined in both academic and grey literature, it is still necessary to highlight that we noted industry presence as a key factor in all four contextual factor categories analysed in this review (World Health Organization, 2009; Assunta and Dorotheo, 2016; Male *et al.*, 2022; African Tobacco Control Alliance (ATCA), 2023). This finding reiterates the importance of countering tobacco industry influence and further examining ways in which the industry impacts policy processes especially in LMICs with emerging markets and good examples of successful strategies to mitigate the industry's influence. An additional layer to this interference, as noted under exogenous contextual factors, is the bi-lateral partnerships offered by countries such as China and Japan to countries such as Zimbabwe and Ethiopia that work to further tobacco industry interests (Fang *et al.*, 2020; Habebo and Takian, 2020).

Given the importance of understanding policy processes and political factors relevant to the WHO FCTC implementation, we believe that there is value in strengthening the evidence base via academic research. Based on our findings, we suggest three key considerations for further research focused on the context of the WHO FCTC implementation at the country level. First, is the importance of recognizing differing and common ways in which the tobacco industry operates in countries to impact policy and political processes. This knowledge is instrumental to building advocacy coalition efforts to counter industry interference. For example, in countries such as Zimbabwe and Malawi, where tobacco growing is a prominent feature of economic policy, the tobacco industry has strong inroads to policymakers as opposed to countries like Mauritius where this is not the case (Lown, McDaniel and Malone, 2016; Smith and Lee, 2018; Kusi-Ampofo, 2021). Additionally, it will also be important to understand the political and economic impact of bi-lateral influence that aligns with industry interests (Fang *et al.*, 2020). Second, comprehensive analyses of wide-ranging contextual factors affecting policy and political processes will provide an understanding of which actors to support as key stakeholders and recognize policy entrepreneurs. This step will be critical to moving the policy advocacy agenda within the country. For example, civil society played a significant role in pushing forward Kenya's tobacco control efforts (Mohamed *et al.*, 2018; Wisdom *et al.*, 2018). Finally, as political determinants are constantly changing, researching the impact of these dynamics on the WHO FCTC implementation process might help national and international actors, including funders, be more responsive. In Zambia, for example, a deeper contextual analysis of the political and policy process, including actors that are opposing and driving the WHO FCTC compliant legislation,

might assist in overcoming implementation challenges (Worth, 2023). It will be helpful to examine the relative magnitude of the effects of these different contextual categories (situational, structural, cultural and exogenous). The recommendations for further research on the context of WHO FCTC implementation align with Global Strategy to Accelerate Tobacco Control 2019-25. In particular, our recommendations are reflected in strategic priority 2 (Building international alliances and partnerships across sectors and civil society to contribute to WHO FCTC implementation) and strategic priority 3 (Protecting the integrity and building on the achievements under the WHO FCTC) (World Health Organization, 2019). The Strategy foregrounds the importance of situating tobacco control in wider political, economic, and societal contexts and the need to work across sectors to enhance whole-of-government cooperation and coordination. Our findings suggest that within countries there exist unique contextual factors, such as the presence or absence of tobacco growing, that shape implementation as well as common factors, such as industry influence, which can inform targeted and context-informed implementation.

Limitations:

A limitation of our review was its focus only on countries that had ratified the WHO FCTC by October 25, 2022 (search completion date). Countries such as Malawi or Somalia were not included in this study. However, this decision allowed us to examine countries with a longer history related to the WHO FCTC implementation. A second limitation was our focus on policy implementation post-ratification of the WHO FCTC. Important lessons can be learned from further research on policy processes leading up to the WHO FCTC ratification. We also did not use African Journals Online (AJOL)

opting to use Scopus, PAIS etc. We will consider using this database in the future. Furthermore, as this was a scoping review we did not assess study quality and potential risk of bias.

Conclusion:

Contextual factors play an important role in policy formulation, legitimation, implementation, and evaluation. Further understanding contextual factors affecting the WHO FCTC national level implementation via dedicated research can strengthen policy efforts in countries that are at early stages of policy formulation and for countries that are aiming to strengthen policy implementation efforts. Better understanding of context including political and interconnected economic processes can also help re-align support for countries from bodies such as the WHO FCTC Secretariat, the WHO, other regional and global actors.

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Supplementary File 1: Definitions of contextual factor categories and relevant examples

Table 1: Contextual Factor Category definitions and examples

Contextual Factor Category	**Description**	**Examples**
Situational	Factors that stem from particular and less repetitive events such as war, health crises, or political instability	The COVID-19 pandemic, armed conflicts, political unrest or instability affecting countries (e.g. Ethiopia's political unrest affecting FCTC implementation)
Structural	Factors related to major, less transient elements of economic structure, political system, technological change, degree of urbanization, structure of the labor market and demographic structure	Economic policy or political strategy that impede WHO FCTC implementation such as a country's economic development strategic plan that relies on tobacco
Cultural	Factors related to socio-cultural elements such as the level of literacy, and values on issues such as religion, gender, participation, and corruption	Cultural identification with tobacco and tobacco industry using pop-culture to promote tobacco using avenues such as sports
Environmental or exogenous	Factors that are external but relevant to the national political system such as the role of transnational companies and international agreements and events.	WHO FCTC ratification by countries, influence of global goals such as the SDGs

Supplementary File 2: Scoping review search terms for each database and use of Boolean operators

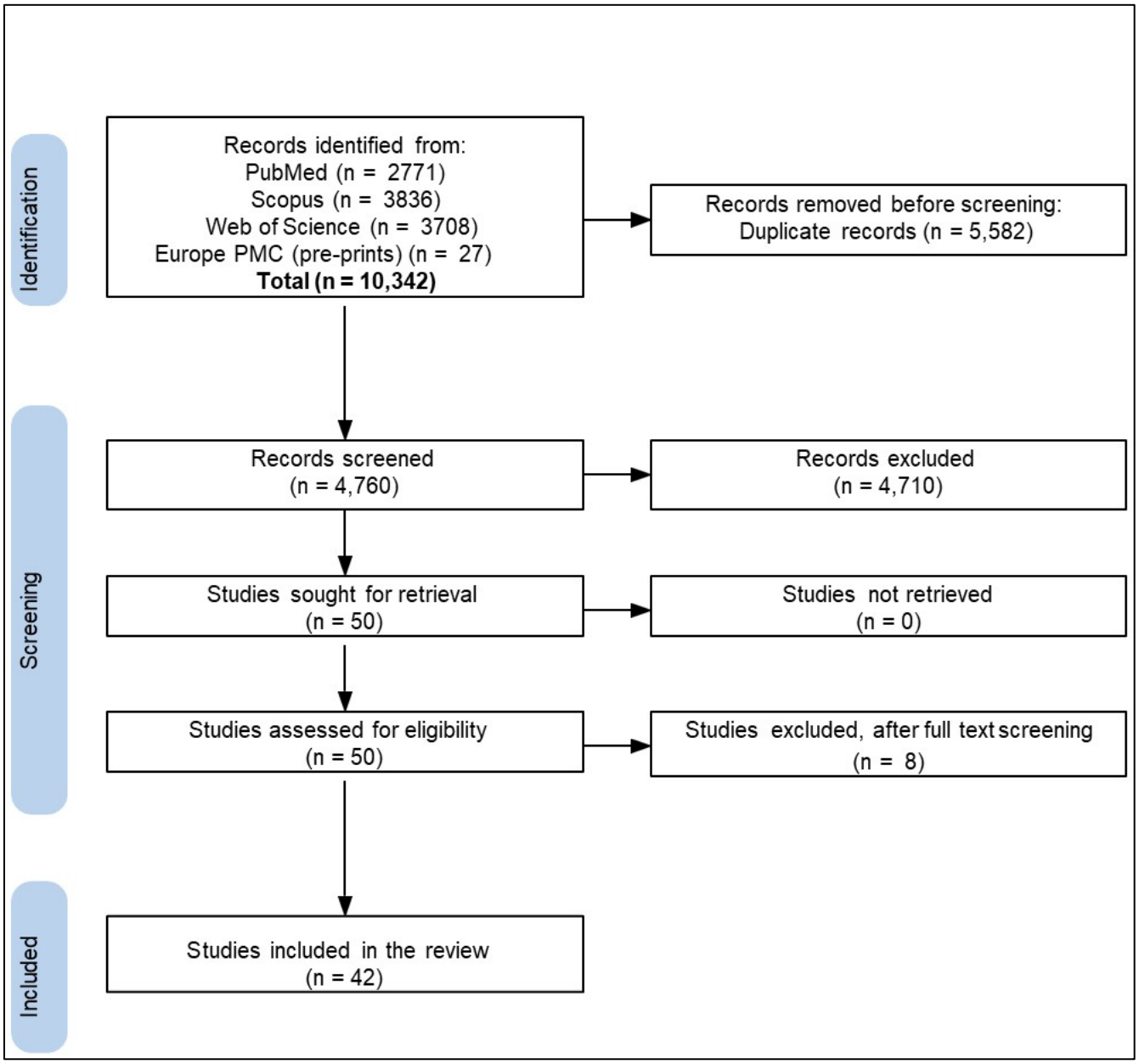
Table 1: Search strings for each academic database

Database	Search terms
Scopus	(TITLE-ABS-KEY ("tobacco control" OR "framework convention" OR fctc OR mpower) AND TITLE-ABS-KEY (implement* OR context*)) OR TITLE ("framework convention on tobacco control" OR mpower)
Web of Science	(TS=("tobacco control" OR "framework convention" OR fctc OR MPOWER) AND TS=(implement* OR context*)) OR TI=("Framework Convention on Tobacco Control" OR mpower)
PubMed	(((((("World Health Organization"[Mesh]) AND ((("Tobacco Use/legislation and jurisprudence"[Mesh] OR "Tobacco Use/organization and administration"[Mesh] OR "Tobacco Use/prevention and control"[Mesh])) OR (((((("Tobacco Use Cessation"[Mesh]) OR ("Tobacco Products/legislation and jurisprudence"[Mesh] OR "Tobacco Products/organization and administration"[Mesh])) OR ("Tobacco Smoking/legislation and jurisprudence"[Mesh] OR "Tobacco Smoking/organization and administration"[Mesh] OR "Tobacco Smoking/prevention and control"[Mesh])) OR ("Smoking Cessation/legislation and jurisprudence"[Mesh] OR "Smoking Cessation/organization and administration"[Mesh])) OR ("Tobacco Industry/legislation and jurisprudence"[Mesh] OR "Tobacco Industry/organization and administration"[Mesh])))) OR ("tobacco control"[Text Word] OR "framework convention"[Text Word] OR fctc[Text Word] OR mpower[Text Word])) AND (("Health Plan Implementation"[Mesh]) OR (implement*[Text Word] OR context*[Text Word]))) OR ("Framework Convention on Tobacco Control"[Title] OR mpower[Title]))
Europe PMC (pre-prints only)	(("tobacco control" OR "framework convention" OR fctc OR MPOWER) AND (implement* OR context*)) OR TITLE:("Framework Convention on Tobacco Control" OR mpower)

We used Boolean operators to connect the search terms. Within the search mechanics, the databases include both terms together when separated by the Boolean operator 'AND'; the databases will return results with at least one of the terms when the search terms are separated by 'OR'. The use of '*' allows for different variations of the word to be searched. For example, "context*" will search for contextual and other variations of the word starting with context.

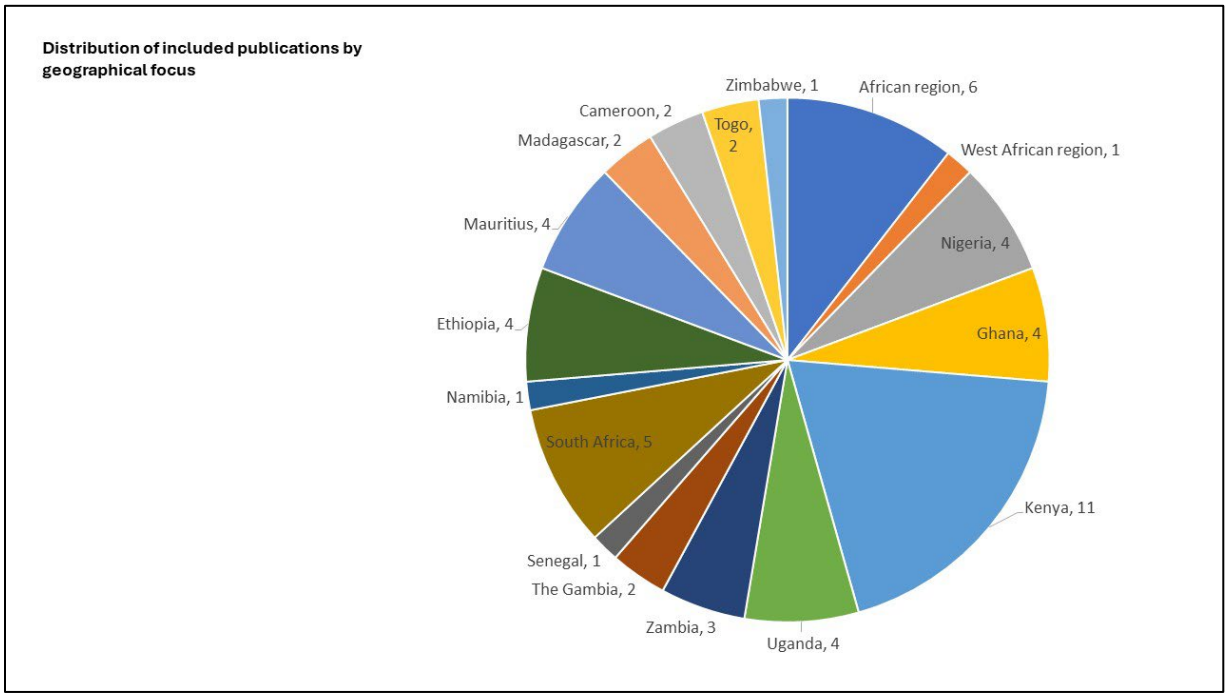
Supplementary File 3: Publication Selection Flow Chart

Figure 1: Publication Selection Flow Chart



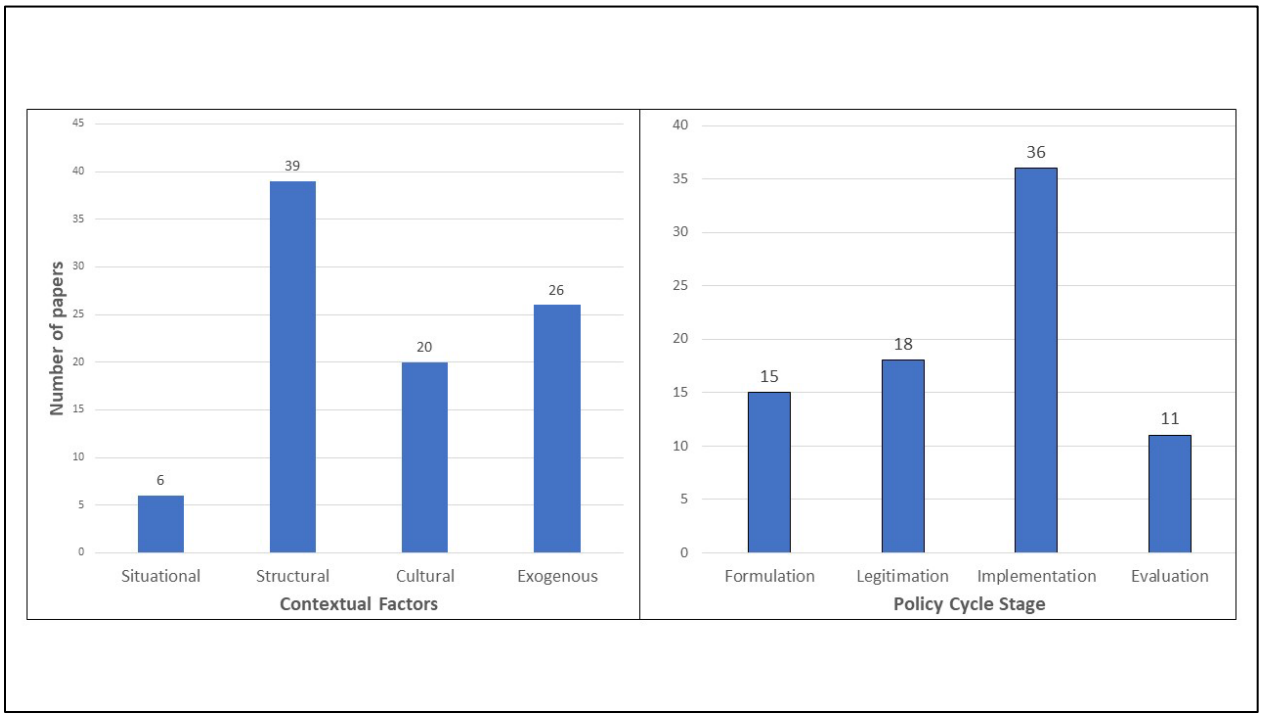
Supplementary File 4: Number of publications by geographic focus

Figure 1: Distribution of included publications by geographic focus



Supplementary File 5: Number of publications per contextual category and policy cycle stage

Figure 1: Number of referenced papers by contextual factor category and policy cycle stage



Bridging Text: Chapters 5 and 6

The previous chapter examined how researchers engage with context in research on WHO FCTC implementation in the African region. The findings highlighted how different contextual factors are implicated in shaping policy processes with the finding that structural context is the most studied category of factors. Additionally, the results of the scoping review underscored the importance of examining country specific contextual factors affecting WHO FCTC implementation.

Zimbabwe is the highest tobacco producer in the African region (top five in the world) and a signatory of the WHO FCTC since 2014. The country continues to face tension n between promoting tobacco as an economic commodity and the challenges tobacco farming poses to smallholder farmers' health and wellbeing and environmental degradation. Additionally, it is essential to explore how the promotion of tobacco farming is affecting demand reduction measures of tobacco control in the country.

In the next chapter, I present an analysis of interviews conducted with stakeholders from diverse sectors including government ministries, non-governmental organizations, intergovernmental organizations, farmer unions, industry and para-statal organizations. The aim of this study was to understand the political economy of tobacco in Zimbabwe inclusive of contextual factors that affect policy implementation. I use interpretive description methodology with key informant interviews as the main data collection method. This methodology allows us to gain diverse perspectives and also adapt our questions based on relevant data and answers from participants. Building on the methodological foundations of this study, I situate the findings within the relevant economic, legal and policy context to provide a comprehensive picture of the political economy of tobacco in Zimbabwe.

Chapter 6: Manuscript Two - The Political Economy of Tobacco of Zimbabwe: An Analysis of Stakeholder Perspectives

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Abstract:

Despite the harmful impacts of tobacco growing on farmers and the planet and the known harms from tobacco use, tobacco continues to be viewed as a path to economic development by some governments. Zimbabwe is one of the top five tobacco producers in the world and the largest tobacco producer in the African region. Though it acceded to World Health Organization Framework Convention of Tobacco Control (WHO FCTC) in 2014, Zimbabwe continues to prioritize tobacco production, especially as a foreign income earner, making it difficult to pursue comprehensive WHO FCTC implementation. Understanding the political economy of tobacco in Zimbabwe is necessary for effective implementation of the WHO FCTC. This study aimed to understand key stakeholder perspectives on the political economy of Tobacco in Zimbabwe via qualitative interviews. These stakeholders (n=23) included government, non-governmental, para-statal and other stakeholders in Zimbabwe.

Findings included the following themes. First, there was stakeholder consensus on the government prioritizing tobacco as it is a key foreign income earner for the country. Second, stakeholders noted that smallholder farmers suffer due to insufficient earnings and are trapped in debt. Third, stakeholders stressed that tobacco farmers' health remains poor due to the negative impact of tobacco farming. Fifth, stakeholders noted rapid deforestation due to tobacco farming contributes to climate crisis and is also affecting the sustainability of the tobacco industry. Sixth, stakeholders indicated that the WHO FCTC implementation faces barriers due to tobacco being an important economic

commodity affecting both supply and demand reduction efforts. Finally, stakeholders indicated that it is unlikely for Zimbabwe to move away from tobacco farming within the next decade. However, findings indicate that rising challenges related to tobacco including tobacco use among youth, deforestation, farmer health, and farmer poverty and debt may be necessary policy imperatives for the government to strategize moving away from tobacco.

Introduction:

Globally, every year, there are over 8 million deaths associated with tobacco use and second-hand smoke is estimated to cause 1.3 million deaths among non-smokers [1]. Tobacco farming is also harmful to human and planetary health. It contributes to food insecurity occupying 3.2 million hectares of fertile land globally that could be used to grow food crops, while 349 million people face acute food insecurity [2]. Tobacco farming practices pose health risks to growers and those handling the leaf. [2] Tobacco farming also has implications for the climate crisis especially due to deforestation.[2] Despite all of the harmful impacts of tobacco growing and use, tobacco continues to be viewed as a path to economic development by some governments [3,4]. Yet the promise of economic prosperity associated with tobacco farming has not materialized for smallholder farmers, often leading rural households into perpetual debt [5], and in some instances necessitating government support in the form of poverty alleviation programs [6].

Zimbabwe is one of the top five tobacco producers in the world and the largest tobacco producer in the African region [7–10]. The World Health Organization Framework

Convention of Tobacco Control (WHO FCTC) came into force in 2005, focused on reducing tobacco consumption and tobacco supply via demand and supply reduction measures respectively [11]. Though it acceded to WHO FCTC in 2014, Zimbabwe continues to prioritize tobacco production, especially as a foreign income earner [10,12,13]. In 2021, Zimbabwe exported 220,000 metric tons of tobacco, regaining its position as one of the top five tobacco exporters in the world [8]. In 2023, Zimbabwe exported 233,896 metric tons of tobacco leaf [14]. The government continues to prioritize tobacco within its development plans, setting an agricultural output target of 300,000 metric tons by 2024-25 in its National Development Strategy 1 (NDS1) 2021-25 [15]. This is in contravention to the Article 17 of the WHO FCTC which compels Parties to the treaty to find alternative livelihoods for those in tobacco industry [16]. In 2020, Zimbabwe's tobacco exports amounted to 16.9% of the total export commodities and 2.4% of the total Gross Domestic Production (GDP) [10]. According to the NDS1, tobacco and gold rank as the main export products of Zimbabwe [15,17]. A Tobacco Value Chain Transformation Strategy approved in 2021 seeks to focus on increased tobacco production, localization of the financing of the crop, production of cigarettes and their exports to increase the value of Zimbabwean tobacco industry to US$5 billion by 2025 [18]. As of 2018, tobacco growing in Zimbabwe involved 50,000 small scale growers (6 ha per individual), 8000 small scale commercial growers (148 ha), 70,000 communal growers (12 ha), and 9000 medium- to large-scale growers (318 – 2,200 ha) [19].

The historical context of Zimbabwe, in particular its almost 100 years of colonization prior to independence in 1980, plays an important role in understanding the political

economy of commercial tobacco in the country. The British South Africa Company settlers established large farms to grow tobacco for export in what was then called Southern Rhodesia. Despite disruptions caused by World War I, tobacco production grew dramatically between the early and mid-1900s propelled in part by the British Empire's desire to source tobacco leaf from its colonies rather than from America [20]. The farming of Virginia leaf, the main tobacco export of Zimbabwe, began in 1910 by the settler colonials who carried significant political power and owned some of the best farming land [9,20]. Colonial settlers reinforced their exclusive rights to tobacco growing through laws such as the Tobacco Licensing Act (1933) that restricted tobacco farming to European owed land [21].

After independence, government supported programs were established in order to diversify the national economic activities to meet need for foreign currency and ensure economic stability The post-independence tobacco trajectory can be broken down into two critical periods: the initial period between 1980 and 2000 and the post 2000 periods [17]. The dividing line between the two time periods is the landmark Fast Track Land Reform Program (FLTRP) initiated in the year 2000. During the early years of independence (1980-1999), tobacco production was mainly conducted on large commercial farms mostly owned by white farmers. Main stakeholders in the industry included Zimbabwe Tobacco Association, Tobacco Industrial Marketing Board (TIMB), Tobacco Trade Association, the Tobacco Research Board, the Agricultural Finance Corporation and the Department of Agriculture Technical Extension Services [17]. While post-independence priorities focused on land redistribution, these efforts stalled due to the need for foreign currency and economic stability. Following fast-track land re-

distribution and related breakdown of the rule of law between 2000-2002, Zimbabwe faced sanctions introduced by the European Union and the United States [22–24]. Affected by sanctions and economic crisis Zimbabwe saw record inflation rates and poor revenues [22,24]. Between 1999 and 2008, Zimbabwe experienced a 50% decrease in GDP [5,25]. Zimbabwe continues to face sanctions from the European Union, United Kingdom and the United States, citing Zimbabwe's human rights record including violent crackdowns against government opposition [26]. African country leaders, from the beginning, refused to endorse the sanctions against Zimbabwe [22]. In August of 2023 the *United Nations special rapporteur on the negative impact of unilateral and coercive measures on the enjoyment of human rights*, called for lifting of sanctions highlighting the adverse impact they have on living conditions and human rights of Zimbabweans at a time of crisis [26]. In March 2024, the US revoked a sanction program administered by its Office of Foreign Assets Control removing restrictions on some state-owned companies and individuals but also saw 11 individuals and three entities, including the country's sitting president, being sanctioned under the Global Magnitsky Human Rights Accountability Act [27].

Zimbabwe's *Vision 2030*, unveiled in 2018, highlights the government's goal to make Zimbabwe an upper middle-income country by 2030 [28,29]. One of the main focal points is to regain investor confidence via policies that focus on "upholding democratic principles, rule of law and property rights,"[29]. Vision 2030 also highlights Zimbabwe's intention to prioritize private sector led growth which currently includes the tobacco industry [29]. At present, Zimbabwe continues to face severe economic hardship due to high levels of inflation and a volatile currency exchange rate [30]. The projected slowing

of real GDP growth (which remained high at 6.5% in 2022) affected by high inflation (at 47.6% in February 2024) and exchange rates also contribute to continuing the economic crisis in Zimbabwe [25,30]. The exchange rate moved from ZWL 142 on 4 April 2022 to ZWL 26,412 on 4 April 2024 per US dollar [31]. Between January and March 2024, local currency has depreciated more than 70% against the US dollar [25]. As a result, communities in Zimbabwe face extreme poverty [32]. Poverty is high especially in the context of agricultural production affected by persistent inflation, high dependence on low productivity agriculture, impacts of natural disasters, including drought, and the COVID-19 pandemic [28,30,32,33].

Given the limited foreign currency earning options amidst continuing sanctions, Zimbabwe continues to prioritize tobacco [15]. This prioritization has been strengthened especially after the entry of China as a major investor [34]. Contract farming has strengthened the role of the private tobacco companies in Zimbabwe. Due to banks facing challenges following economic sanctions imposed on the country, farmers turned to contract companies for financial input for tobacco farming [19]. Contract companies actively recruit farmers to grow tobacco, provide input, financing and also buy the tobacco output from smallholder farmers [19]. In 2018, as per a TIMB report, the private companies that had the largest market share in Zimbabwe were Zimbabwe Leaf Tobacco Company (13.2%), Northern Tobacco (12.2%), Mashonaland (11.7%), Premium (9.7%) and Tian Ze (9.2%).[35] Despite its macro-economic importance, Zimbabwe's tobacco farming sector is rife with many challenges. First, small holder farmers face challenges in earning profits, forcing them into debt which follows the regional pattern in Africa of debt faced by tobacco smallholder farmers [2,3,5]. Second,

the health of farmers is at risk due to tobacco farming practices [2,8,36]. A related concern is the use of child labor and the negative health impact on children who work on tobacco farms [37]. Third, Zimbabwe is increasingly losing its forests due to tobacco farming (for both farming land and curing of tobacco) [36,37]. The government and the tobacco industry in Zimbabwe have recognized deforestation as a key challenge and have launched reforestation programs, the impact of which requires further examination [36,37].

When considering domestic tobacco use, Zimbabwe's demand reduction efforts—including regulating tobacco advertising—continue to face barriers due to tensions between tobacco control and its importance as an economic commodity [3,12]. In 2021, the prevalence of tobacco use in Zimbabwe was 11.6%, with a much higher prevalence among men than women [12,38]. In 2019, 8% of all deaths in the country were attributed to tobacco use [12,38]. Zimbabwe is also facing a substance abuse crisis including the use of methamphetamine which disproportionately impacts youth. This crisis led the government to form an inter-ministerial task force to address substance abuse [39,40]. The association of substance abuse to tobacco use, especially among youth, is an important aspect that requires further examination.

These contextual factors illustrate the importance of understanding the political economy of tobacco to inform efforts to strengthen WHO FCTC implementation and support the development goals of Zimbabwe. A crucial step in developing this understanding is soliciting perspectives of diverse stakeholders regarding the complexities of the political economy of tobacco, policy implementation, including supply and demand reduction, as well as other policy and market factors. To this end, we

conducted a qualitative study that elicited the views of government, non-governmental, para-statal and other stakeholders in Zimbabwe. The objective of this study is to understand how key stakeholders in Zimbabwe view tobacco as an economic commodity and as a public health concern, including perspectives on alternatives to tobacco as an economic commodity.

Methods

We used interpretive description (ID) methodology for this research as it allows us to gain diverse perspectives on complex topics that are difficult to capture using other methodologies [41]. According to Thorne et al., interpretive description "provides direction in the creation of an interpretive account that is generated on the basis of informed questioning, using techniques of reflective, critical examination, and which will ultimately guide and inform disciplinary thought in some manner,"[42]. While distinct in its approach, ID draws on well-established qualitative methods of data collection and analysis from grounded theory, naturalistic inquiry, and ethnography [42,43].

We employed purposive sampling to ensure diverse sectorial representation. We invited key stakeholders (from February 1, 2023 till March 31, 2023) who are involved in tobacco policy, including representatives from government, non-governmental organizations, parastatal organizations, unions, industry, and academic sectors. Across these sectors, our key informants (KIs) included subject matter experts and professionals in governance, environmental sustainability, business sustainability, business development, agriculture (both tobacco and non-tobacco), public health, and economic development. We conducted 23 key informant interviews (KIIs) between

February 13, 2023, and March 31, 2023. We did not interview any minors. The interviews were conducted by SB, NN, AK, TN and AC. Interviews always had at least four members of the team present. Of the 23 interviews, 22 interviews were led by SB and NN led 1 interview. Prior to interviewing the interviewer explained the details of the project, details of informed consent provision, data collection and management of the project and the expected output of the data collected. All participants provided written informed consent prior to the interview. Table 1 provides a summary of KII numbers associated with each sector. A semi-structured interview guide was developed based on a template that was built for KIIs in Mozambique and Zimbabwe, as part of a larger study (Supplementary File 1).[44] The interview guide aimed to explore the development goals of the country, the importance of tobacco to development, the impact of tobacco on health and wellbeing, and the progress of the implementation of the WHO FCTC including barriers faced and the future of tobacco farming in the country. Interviews ranged from 20-60 minutes with an average length of 30 minutes. Each interview was recorded with prior consent from participants. One KI requested that the interview not be recorded due to the topic's sensitive nature, so detailed notes were taken during and after the interview. All recorded interviews were transcribed verbatim, and interview data were anonymized then saved in a secure data platform.

Table 1: Key informants categorized by sector

Stakeholder categories	**KIIs (n=23)**
Governmental	6
Non-governmental and inter-governmental organizations	6
Para-statal organizations	5
Industry	2
Academics	2
Farmer Unions	2

We used NVivo 14 software to organize the analysis and used an inductive analytical approach to identify themes that were relevant to the political economy of tobacco in Zimbabwe. Our analytical approach was two tiered. First, following a period of familiarization with the data, we initiated a process of iterative coding [45]. One researcher (SB) coded two complete interviews and generated an initial codebook. A second researcher (RL) checked for alignment of coding using the same two interviews. Once alignment was established via discussion, SB coded the rest of the interviews. This initial coding process served to organize the raw data based on child-codes and parent-codes (an aggregate of child codes). Child codes were developed first and then aggregated into parent codes based on relevance. Second, we grouped parent codes into categories. When reading and coding the data, multiple aspects of tobacco in Zimbabwe including its relevance to the economy, livelihoods, health of the public, and health of farmers, were taken into account. Guided by ID methodology we used interview notes, coding memos, and literature to further interpret the data and to collate data into six main themes for results reporting. Our interpretation of data including theme generation aimed to situate the data in the political-economic context of Zimbabwe. We used this approach to achieve ‘meaningful coherence’ from study design to data interpretation and reporting [46].

Our positionality was informed by citizenship, research experience and lived experiences, which in turn influenced our analysis and reporting. Our authorship team consists of four Zimbabwean researchers living in Zimbabwe (AK, NN, TN, AC), four researchers in Canada (SB, RL, MH, AA) and one in the United States (JD). RL, AA, MH are Canadian citizens and JD is a dual Canadian-US citizen. SB is a Sri Lankan

citizen and has over 5 years of policy research experience in global health. RL, JD have been working on the political economy of tobacco control with colleagues based in the countries where the projects have focused (Kenya, Malawi, Zambia, Mozambique, Zimbabwe) for the past 15 years. MH and AA both have over 10 years of global health research experience. NN is an agronomist with over 10 years of experience in agriculture research and implementation of agricultural projects in the African region including Zimbabwe. AK has over 5 years of research experience in tobacco in Zimbabwe and over 10 years of agriculture research in Zimbabwe. TN and AC are recently graduated undergraduate students in agricultural economics from University of Zimbabwe, Harare.

This study received ethics approval from the Institutional Review Boards of McGill University's Faculty of Medicine and Health Sciences and the Research Council of Zimbabwe.

To provide a holistic picture of the political economy of tobacco and to situate KI quotes within the Zimbabwe context, we use official government data, data reported in the media from national government reports, data from inter-governmental organizations and research literature to complement the main emphasis on KI perspectives. This includes illustrating the points made by KIs and providing necessary context for KI statements.

Results

Our analysis yielded six themes that reflected the participants perspectives on the key political economy features of tobacco in Zimbabwe. 1) macro-economic value and

government prioritization of tobacco, 2) economic impact of tobacco on smallholder farmers, 3) tobacco and health, 4) deforestation and tobacco, 5) WHO FCTC implementation in Zimbabwe and 6) the future of tobacco in Zimbabwe.

Macro-economic value and government prioritization of tobacco

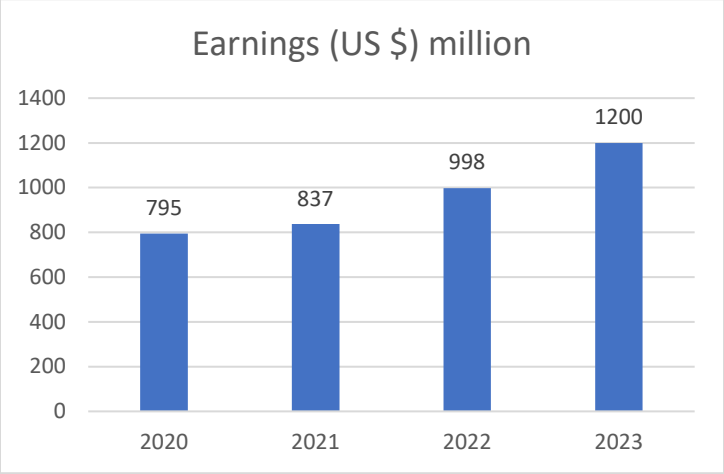
Under the first theme we explore the reasons for macro-economic prioritization of tobacco, the use of policy and the attitude of the government towards prioritizing tobacco.

All KIs described tobacco as the foremost agricultural product of Zimbabwe. One KI re-iterated the popular phrasing to highlight this prioritization, *"what do they call it? Zimbabwe's golden leaf"* (KI 23). All participant answers mentioned tobacco's role as a foreign income earner at the macro-economic level. Government sector KIs noted tobacco's forex earning capacity for Zimbabwe as key factors for its attractiveness. As one participant commented *"it's the number one in terms of forex earnings right so we produce I think over 200 000 metric tons of tobacco…we view it as a 1 billion crop nationwide. It's a 1 billion crop,"* (KI 7).

Zimbabwe earned a reported 1.2 billion USD as of December 15, 2023 exporting 233,896 metric tons of tobacco leaf [14]. This is an increase in revenue of about 225 million USD over the corresponding period in 2022 during which Zimbabwe exported 196,565 metric tons of tobacco.[14] TIMB reports indicate as of October 27, 2023, tobacco cultivated area increased by 21% in 2023 compared to 2022 reaching a total of 19, 526 ha [47]. The average price for tobacco shipments was USD 5.26 per Kg in 2023 compared to USD 4.96 per Kg during the same period in 2022 [14]. As 2020 data

indicates tobacco accounts for close to 17% of total exports and the absolute amount of tobacco exports has continued to increase since 2020 [10]. Figure 1 illustrates the increase in total earnings from 2020 to 2023 indicating an upward trend [48]. This increased output aligns with the Government of Zimbabwe's development goal of strengthening agriculture as a revenue earner. This main goal includes inter-related sub-goals of reaching 300,000 metric tons of tobacco production by 2024-25 and using value added tobacco products to increase the value of the industry to US $ 5 billion by 2025 [15,29].

Figure 1: Total earnings from tobacco exports from 2020-2023 in Zimbabwe



Availability of the international market, especially with the entry of China as a major investor, is another factor that KIs highlighted. A government KI noted *"we've had quite a bit of approaches from the East, uh, China, the Middle East and so forth… So marketing (selling of tobacco) issues are not really a problem,"* (KI 8). Zimbabwe and China signed a memorandum of understanding in 2005 and established the Tian Ze Tobacco Company (TZTC) in Harare [34]. Preferential policy treatment such as the exemption of TZTC from the 2010 law that required all foreign owned companies to

relinquish 51% of shares to local Zimbabweans, highlights the important role China plays in the Zimbabwean tobacco sector [34].

Other KIs from different sectors also indicated the staying power of tobacco within the country's economic agenda. One KI noted this saying, *"You can come up with all sorts of perceptions, but I think Zimbabwe tobacco is here to stay. Whether people are lobbying against it, you know tobacco from Zimbabwe is highly sought after internationally,"* (KI 11). Another echoed the industry narrative of tobacco's value for poverty eradication of tobacco as an income earner and a pathway to achieve Sustainable Development Goals (SDGs) 1 and 2 dedicated to eradicating poverty and hunger. *"…so I believe as a country, we still need the production of tobacco in order to eradicate SDG1 and SDG2, but while we do that, we have to put in controls, policies that ensure that consumers, especially the youth, are not exploited,"* (KI 3).

Tobacco production in Zimbabwe is a multi-stakeholder effort with coordination at the center. KIs pointed out that government efforts are directed towards supporting tobacco as an economic commodity through inter-ministerial, industry and parastatal organizational teams dedicated to tobacco supply. The majority of KIs singled out the parastatal arm, the TIMB, as the organization responsible for convening all tobacco related stakeholders, government tobacco policy implementation and regulatory action. In addition to TIMB, participants delineated farmer unions, tobacco associations, contracting companies, auction floor operators, government ministries, and the Tobacco Research Board as key players. Moving beyond those focused on agriculture, finance and trade, KIs also highlighted the Forestry Commission and other environmental agencies as relevant to tobacco farming due to partnerships focused on reducing

deforestation. Tobacco industry-backed companies such as the Sustainable Afforestation Association work with the government and small holder farmers to address the deforestation challenge posed by tobacco farming.

Government stakeholders stressed the fact that government is not in competition with the private or any other sector but aims to work with them, facilitating collaboration. A government KI noted this saying, *"…we are really encouraging that we work together. So, government is not competing with private sector, but we complement where the private sector or NGO doing their work, uh, in the areas we don't go there and do the same work,"* (KI 8).

The government continues to prioritize tobacco, embedding strategies to enhance the tobacco sector within national development goals. TIMB, a para-statal organization, remains a crucial stakeholder in managing tobacco sector production and navigating the challenges related to tobacco production under the guidance of the government. However, the functionality of the tobacco sector in Zimbabwe is dependent upon several different stakeholders including contract companies and smallholder farmers.

Economic impact of tobacco on smallholder farmers

Under the second theme we examine if tobacco is a lucrative commodity for smallholder farmers and the reasons for its earning potential or lack thereof.

Despite the emphasis put on tobacco as an important economic commodity for the country, the majority of the KIs highlighted how smallholder farmers are unable to turn a profit from tobacco farming. This outcome has been documented in countries in the African region such as Malawi, Kenya, Mozambique, and Zambia, and countries in other

global regions such as Indonesia and Philippines [49–52]. This pattern has also been identified in Zimbabwe where tobacco farming has caused smallholder farmers to become trapped in debt cycles with contracting companies [5,53]. KIs indicated high prices of inputs, fluctuating pricing of tobacco and weather conditions as major factors impacting profit. One para-statal KI noted,

"Farmers are finding it difficult to make a living out of this whole tobacco production because of the highly priced inputs and what they will then realize on the market, it's not really breaking even," (KI 12).

An industry associated KI noted the presence of a 'false profit' from tobacco earnings saying,

"I can call it, what can I call it, a false profit. Like they use the family members, they use the family members to do the farming... So, when calculating, after selling, they don't like deduct the cost of production from the revenue which they make. So, I'm saying most of them, they break even," (KI 14).

KIs also highlighted that the profits from tobacco farming usually do not end up with farmers but with middlemen such as leaf buyers and those who manage the buying process. An academic research sector KI noted this saying,

"So, most of the money, if you look at that value chain, the farmers really get, they don't get as much as you want them to get. But instead, what you have is these are the buyers and then you have the processors. Those are the guys who are really getting much of the marketing margins in tobacco," (KI 15).

There were counter narratives from some government KIs highlighting how tobacco remains a key strategic crop in alleviating rural poverty for the government and one KI arguing that some farmers have dedicated more land to tobacco which disproves that tobacco is unprofitable.

KIs also indicated that one of the many reasons for tobacco farmers to remain in tobacco is that they lack alternatives for a cash crop with an established market value chain. The nature of the contracts with private contracting companies also plays a role in the lack of financial security and debt challenges that the farmers face. One industry KI noted this saying, *"Because in Zimbabwe, small scale farming is only valid for a year, we renew contracts every year, we don't have long term contracts. If we had long term contracts, like previously on commercial farms, a farmer could get like a long-term contract of 10 to 25 years, now with these small-scale farmers, the maximum is one year, so recovering everything in one year is very difficult,"* (KI 14).

The lack of profit for smallholder farmers which traps them in debt with private contracting companies is at odds with the high forex earning potential noted by KIs at the macro-economic level.

Tobacco and health

Within the third theme, we examine health in Zimbabwe as it pertains to tobacco from two angles: the health of the public related to tobacco consumption and the health of tobacco farmers.

Tobacco use in Zimbabwe

One of the recurring points raised by both industry and government KIs championing tobacco farming is that there is a low recorded consumption rate of tobacco in Zimbabwe, despite being a key exporter of tobacco. However, according to WHO, age-standardized estimated tobacco use prevalence in 2021 was 21.9% among men and 1.2% among women, with 11.6% for both sexes [12]. In 2015, Demographic Health Survey (DHS) recorded 17.7% of men and 0.5% of women aged 15-54 smoked tobacco. The 2014 Global Youth Tobacco Survey indicated 20% of all youth aged 13-15 use tobacco (smoking and smokeless). These prevalence rates are in the middle of the range based on African region estimates for tobacco use. That youth prevalence rates are higher than current adult rates indicate a problematic trend toward increased tobacco use in the future. The regional estimates indicate a range of 4.6% to 36.6% for adolescent girls and 7.8% to 36.5% for boys as per WHO African Region Office [54]. Zimbabwe's prevalence monitoring also requires strengthening with the last countrywide survey completed in 2015. As of December 31, 2022, the National Tobacco Control Program had one full-time staff member [12]. This challenge of monitoring tobacco use was noted by KIs from the health sector representing both governmental and non-governmental organizations.

"young people, they use tobacco, but I don't have any statistics to quantify how much of tobacco use is happening," (KI 9).

Irrespective of evidence to the contrary, most KIs including the health sector experts in governmental, non-governmental and inter-governmental sectors repeated the notion

that tobacco prevalence is observed to be low. One KI from the health sector noted that there is a preference among youth for psychoactive drugs saying,

"So, I think that's the issue now with tobacco, that, you know, it doesn't give a high that lasts. So, our young people are now looking for alternatives. So, we are not likely going to see challenges with tobacco in the near future, but our main challenges are going to be in the area of hard drugs," (KI 16).

A non-governmental sector KI focusing on health noted that alcohol and tobacco use can be associated with psychoactive drugs but that more research is required to ascertain this link.

"But they start with tobacco. It's just cigarettes and alcohol. Then maybe later they graduate to those dangerous substances," (KI 2). Given the high tobacco use among youth some health focused non-governmental KIs, indicated that there is a need for better coordination among public health actors and targeted advocacy for demand reduction policies.

Tobacco farmers' health

All KIs who indicated that they had knowledge on tobacco farmer health highlighted that this was an urgent and important concern. Similar to what has been observed in the region, many KIs pointed to the handling of chemicals, inadequate protective equipment, being continuously exposed to tobacco and harmful chemicals inhaled during tobacco curing as key risk factors related to farmer health [55]. The release of *Bitter Harvest*, a report by the Human Rights Watch in 2018 put the spotlight on farmer health and wellbeing including the use of child labor and exposure of children to harmful

chemicals in tobacco farms in Zimbabwe [37]. The KIs that focused on farmer wellbeing also highlighted the detrimental mental health implications of unprofitable tobacco growing within a broader context of economic hardship including high levels of inflation. As per KIs the challenging socio-economic conditions due to the unprofitability in smallholder farming in tobacco (and even in other sectors) can lead to self-harm. One public health sector KI noted this saying,

"But in terms of the health and well-being of farmers, I think contract farming has really been detrimental. So, I think we can talk about issues to do with mental health, because many times farmers are not able to actually reach the projected target of output…And then they use those pesticides, which they are given as part of the inputs, then they use those pesticides to commit suicide," (KI 16).

Following the increased spotlight on working conditions and child labor, the government and para-statal stakeholders have focused more on requiring industry to provide personal protective equipment (PPE) and further training to farmers. KIs indicated that while harm reduction and building awareness on tobacco use is a health sector responsibility, the responsibility of protecting farmer health remains with Ministry of Lands, Agriculture, Fisheries and Rural Development and other tobacco related stakeholders. One KI pointed out that the government is already aware due to multiple health focused stakeholders raising this issue within the government.

"Yeah, it's something that is also recognized as health problem… There are various communications and discussions that they carry out with farmers, of course, in association with Minister of Health and Child Care in terms of educating farmers about

the health risks of, uh, pesticides that are used in agriculture and how they can sufficiently protect themselves from those, uh, using, ah, appropriate protective, uh, uh, clothing," (KI 17).

Para-statal KIs indicated that they have taken significant measures to protect farmers including requiring contractors to provide necessary PPEs. One KI noted this saying,

"So intensive trainees, provision of PPEs, and yeah, those are some of the initiatives and this is how maybe we are trying to help out the situation, especially looking at the health of the farmer. Someone has to take responsibility. So, it's part of the compliance framework. You provide the inputs, you provide the chemicals, provide training and also provide protective clothing." (KI 12).

However, KIs researching and working on farmer wellbeing challenge the idea that there are sufficient efforts to address farmer health and wellbeing by the government and related tobacco farming stakeholders. KIs highlight that one argument that contracting companies make is that the tobacco farmers are not their employees.

"I think we are, we are worse off now than before the land reform because now everyone, every, if you go into tobacco producing communities, every household owns a chemical, they have a chemical that is stored in the house improperly without safety and all those kind of things and they are exposed and the risk and the exposure is getting increased and in the process of application, like I indicated, there's no safety, there's no all those measures," (KI 4).

Some KIs also question the commitment of tobacco contracting companies to ensure farmer wellbeing. One stakeholder highlighted that tobacco smallholder farmers not

having the status of contract company employees is a loophole that has been exploited.

"*And one argument that I heard is that it's (not providing PPEs) because they said farmers are not their employees, so farmers need to care for their own health," (KI 16).*

Tobacco farming sector related KIs highlighted that there are increased efforts to remove child labor from tobacco farming. They highlighted that attention to child labor in tobacco farming has created negative publicity for the tobacco industry, which can lower sales. This decrease in sales remains a key motivational factor for the industry to control child labor. Para-statal KIs indicated that the government bodies have already formed working groups to address child labor and other human rights challenges in tobacco.

"We've been working with the Ministry of Public Service, Labor and Social Welfare, we've been working with the grower representatives themselves, they are part of the working group that is in place to make sure that we address child labor issues and human and labor rights issues. So, such issues, if we don't address child labor issues, you know there are so many other organizations that are on the lookout, they just watch, they observe it, whatever is happening, and any negative publicity will then affect our industry," (KI 12).

Based on KIIs, there was expressed consensus on the negative impacts of tobacco farming on farmer health and the importance of ensuring farmer health and wellbeing. While government and industry highlight policies aimed at safeguarding farmer health, success of these policies at the implementation level remains uncertain.

Deforestation and tobacco farming

Within the fourth theme we examine the extent and the impact of deforestation due to tobacco farming and the success of ongoing solutions.

Zimbabwe is facing a significant challenge due to deforestation related to tobacco farming.[56] One KI pointed this out saying *"Zimbabwe, we are losing about 262,000 hectares of forest every year….the tobacco farming. It's (tobacco) also contributable (contributes to) to 20% of that chunk,"(KI 5)*. A report by the Government of Zimbabwe in relation to Zimbabwe's Nationally Determined Contributions to the Paris Agreement project with United Nations Development Program highlights firewood sourcing, settlements, agricultural activity, wildfire, tobacco curing, charcoal sourcing, brick making, logging, overstocking, construction, mining and brushwood sourcing as direct drivers of deforestation in Zimbabwe [57].

Loss of indigenous forests remains a key concern for both the government and industry stakeholders. Industry associated KIs point out the economic impact of deforestation on tobacco as a key concern and contrast the current experience with Malawi. One KI noted this saying,

"If we look at tobacco production, Zimbabwe used to compete against Malawi on Virginia tobacco production. And now Malawi has stopped, literally stopped producing Virginia tobacco. Why? Because they finished all their trees. Yes. We want to continue supporting government in terms of production of tobacco, Virginia tobacco, because it is, tobacco comes as number one in the agriculture basket," (KI 11).

Many KIs, while highlighting the economic value of tobacco, remain concerned about

the lasting impact of pursuing revenue at the expense of forests. One KI after highlighting 90% of tobacco farmers are reliant on indigenous forests, observed the lasting impact of deforestation saying,

"That (is) what we are really exporting, it's not tobacco (as) they say, but we are exporting our forest. When we say this year we are targeting 300 million kgs of tobacco, it's achievable, but it's coming at the cost of our forest," (KI 5)

The high volume of wood required to cure tobacco needs a consistent source of energy to sustain the production levels Zimbabwe hopes to achieve. One KI highlighted this challenge of the increasing levels of required wood supply for tobacco curing saying,

"What are the implications? One kg of tobacco requires about 10 kgs of wood to cure it. Which means the minister is saying if we are to sustainably cure that whole crop, we need about 3 billion kgs of wood. That's a huge volume of wood," (KI 11).

As KIs indicate, the government and industry are collaborating on planting trees (mostly gum trees – e.g. eucalyptus) for the use of tobacco curing. The Forest Act, the Communal Lands Forest Produce Act, Environmental Management Act, Parks and Wildlife Act, Rural District Councils Act, Statutory Instrument 116 are some of the key legal instruments for protecting forests [57]. Many KIs point to policy measures such as the afforestation levy that is being collected by the government to support afforestation in Zimbabwe. However, the distribution of the funds to relevant stakeholders such as the Forestry Commission has been slow. KIs indicated that the 1.5% levy deducted from gross sales of tobacco starting in 2015 was only channeled to relevant stakeholders from the treasury in 2019. KIs expressed that even when levies are collected properly

on the auction floor, it takes time to reach the afforestation stakeholders from the government treasury and only a "trickle" of the funds from these levies, reach them.

Industry KIs expressed that there is concerted collaborative effort put forth by the government, para-statal organizations along with the tobacco industry to mitigate deforestation. One KI noted this saying,

"We are getting massive support from the government and the para state, like Forestry Commission. They are assisting us very well. We as a company also take part in the government programs for tree planting. You know, Forestry Commission is a regulator of forestry in Zimbabwe. When we face challenges (related to afforestation) with the communities we work with, if we engage them (Forestry Commission), they quickly assist us," (KI 14).

Stakeholders from both the government and industry noted the challenge of not having alternative sources of energy for tobacco curing. KIs indicated that while coal is an option, as it is a non-renewable source of energy, its use is being discouraged due to global agreements on climate crisis. Solar energy has not been successful either, with solar powered curing barns too expensive for smallholder farmers [58].

KIs indicated that the key stakeholders related to afforestation efforts include Environmental Management Agency, Forestry Commission, industry backed Sustainable Afforestation Association, contracting companies, and para-statal bodies. Additionally, research institutes such as the Tobacco Research Board also contribute via research for alternative sources and increasing energy efficiency for tobacco curing.

Yet, these efforts largely remain a work in progress without immediate solutions for forest coverage depletion in Zimbabwe.

"So, it's one big challenge. As much as we want to address deforestation challenges, we need to make sure that we avail an alternative that is affordable. So, it's a challenge. We are working with the industry, we are working with other researchers to try and see how best we can come in and help out the growth, yeah," (KI 12).

While addressing deforestation seems to be a priority on the government agenda, KIs suggested that it is also important to examine whether the cost of protecting Zimbabwe's forests and increasing tobacco output is being transferred to smallholder farmers. One industry KI pointed this out saying,

"I feel it (deforestation) was not looked into for years, sometimes, but if what we are doing now, if it was done like 20 years back, I think it will be at around 100% sustainable….For now, yes, we are waiting for the trees which are growing to mature in other areas like Manikaland area, we provide firewood, but areas like Mashonaland waste, Mashonaland central, it is very far and the transport cost is very high. If we charge the farmer, say 20 cubes of firewood, if we charge him, he will remain with nothing in his or her pocket," (KI 14).

Drivers of deforestation and forest degradation in Zimbabwe (2019) report by the Government of Zimbabwe identifies lack of sustainable resources, issues of governance and political interference as the main challenges to sustain work related to countering deforestation [57].

Prioritization of efforts to address deforestation by government and industry has led to forming inter-sectoral coalitions with the goal of reducing deforestation as it pertains to tobacco farming. However, lack of alternative energy sources (despite ongoing government sponsored research) and the government targets of increasing tobacco production output leaves the deforestation challenge in Zimbabwe unresolved.

WHO FCTC implementation status

The fifth theme focuses on the challenges and opportunities of WHO FCTC implementation in Zimbabwe. Zimbabwe acceded to the WHO FCTC in 2014 [13]. At the time, critics noted that acceding to the WHO FCTC will not soften the anti-tobacco control stance of the country but suggested it may serve as an opportunity for the government to prioritize public health [13]. Additionally, health focused SDG 3 (specifically target 3.a) includes targets for all countries to implement WHO FCTC [59]. There is consensus across all KIs that effective policies and implementation for supply reduction is at least 20 years away in Zimbabwe. KIs from across sectors provided various reasons including foreign currency earning potential, the pride the government (and Zimbabweans) have in its agricultural sector, existence of a strong market especially with China as an investor, lack of a competitive alternative to tobacco and the prevailing poverty levels. These prevailing notions are also affirmed by the government's strategic development plans that aim to continue tobacco as a key crop [15]. Prioritization of tobacco via policy and infrastructure has affected the WHO FCTC implementation in several ways. Currently, Statutory instrument 264 of 2002 remains the government tobacco control regulation used to implement the WHO FCTC especially for demand reduction [60].

Many KIs highlighted the conflict of interest within the government coupled with strong industry presence makes WHO FCTC implementation processes difficult. One KI pointed out that to even attempt to talk about harms caused by tobacco farming or supply reduction policy implementation is a daunting task. Therefore, many health sector stakeholders focus on demand reduction.

"In terms of tobacco growing, I think there's little you can do about it… Also, it depends on the finances which are obtained from the tobacco growing. So, what you need to really talk about, as I said before, (is) more of a reduction of smoking. Because growing they always talk about it, is part of economic, it brings economic growth and the people are tobacco growers," (KI 10).

Currently, complete smoke free laws are applied to healthcare facilities, public transport, universities, educational facilities other than universities, theaters, museums, youth centers, places of worship and public meeting halls [61]. However, this leaves out important places such as government facilities, indoor offices and workplaces, restaurants, cafes, pubs, and bars which can have designated smoking areas [61]. Even in places smoking bans are required, the minister has the power to make an exception and allow people to smoke [12].

One health sector KI pointed out mixed progress in terms of labeling and advertising. Zimbabwe does not have any advertising restrictions and allows companies to sponsor sports teams and advertise on any platform [12]. Advertising and sponsorships are key strategies that the tobacco industry uses to gain young consumers [62]. WHO FCTC

requires member states to comprehensively ban tobacco advertising, promotion and sponsorship.

"…in terms of labelling for tobacco products, the country requires that the contents of tobacco like tar, nicotine, be well labelled, and that is (on)going. And the issue of uh, that tobacco is hazardous is also labelled on all tobacco products, at least those which are uh, formally marketed. So that one is there. And there are uh, other issues, of course, which we are still to work on, have not yet discussed, so much on (a lot), (are) the issues of plain packaging, which actually the FCTC is promoting… the advertisement both on the electronic media and on the packages is actually going on," (KI 17).

Additionally, while Zimbabwe has continued to raise taxes on manufactured tobacco products, some KIs point out that tobacco taxes are not sufficient, and that tobacco products remain cheap in Zimbabwe. Therefore, price is not a deterrent to tobacco consumption.

"the Ministry of Finance… they raise taxes every year so there were raising (of taxes)..but it was insignificant," (KI 10).

"Tobacco in Zimbabwe is not expensive. It's actually cheap. What we would have recommended the government is to introduce more prohibiting costs, uh, for, uh, tobacco, but which the government is not yet ready for that, at least as far as I know now. Probably because of, uh, the economic situation, some members of the society may not, uh, be able to buy the filter cigarettes, but they are able to buy other forms of

cigarettes. So you see, other people can just buy the crushed tobacco and, uh, roll it around the newspaper and start smoking," (KI 17).

Zimbabwe scored 1.25 (from 0-5) in the 2021 Tobacconomics Cigarette Tax Scorecard in the Tobacco Atlas [38]. Tax related policy implementation is low compared even to the African region, which is the lowest among WHO regions, and more so to the rest of the world [38]. The tax scorecard measures price, change in affordability, tax share, and tax structure, and Zimbabwe fares poorly on all four.

Industry interference – or in Zimbabwe's case industry's direct access to the policy makers and ministers - makes it difficult for relevant government officials to implement key provisions of the WHO FCTC. For example, one KI highlighted that if there is a policy implementation effort that the industry did not prefer (such as advertising restrictions) they would directly call the minister responsible which would in turn require an explanation from those ministry staff members implementing the WHO FCTC.

Zimbabwe's health sector actors have been trying to implement at least some of the key demand reduction measures of the WHO FCTC via the Statutory Instrument 264 of 2002. A government KI cited the lack of resources as a key challenge:

"But the main problem is we didn't have enough resources really. Even though we were being helped by the WHO on days like you know, international, no smoking day, we trying to inform people of the dangers of smoking… which go on radio, on print mass media. Only electro print media. Come up on the TV, write the newspapers, come up with the pamphlets, and try to distribute it throughout the provinces but the problem was the resources. For us to really implement the prevention," (KI10).

Both governmental and non-governmental stakeholders indicated lack of resources as a key limitation to WHO FCTC implementation. Inability to advocate for supply reduction policy due to tobacco being a key economic commodity is another key barrier as per KIs. Additionally, KIs noted the need for tobacco control focused research in Zimbabwe to use in advocacy, strategic alliances among national level and intergovernmental health focused stakeholders and improving communication and coalition building to advocate at the highest levels of the government.

The future of tobacco in Zimbabwe

Under the final theme we report KIs views on the future of tobacco in Zimbabwe with the existing tensions between WHO FCTC implementation and government prioritization of tobacco production.

Government, industry, and tobacco-focused parastatal organizations are well aware of the WHO FCTC and country-level responsibility. Government KIs noted that Zimbabwe is moving towards tobacco processing and producing value added tobacco products as viable strategic plans. This shift is also in line with statements from the Ministry of Agriculture. Government KIs mentioned that there is preparation for the potential success of the 'anti-tobacco' campaigns which may lead to low global demand, which in turn will negatively impact Zimbabwe's economy. Some of the alternatives to tobacco mentioned by KIs included horticulture including fruit crops (mangoes, blueberries) and industrial hemp. Research by the Zimbabwe Economic Policy Analysis and Research Institute also indicate that farmers mention soya, cotton, ground nuts, and sunflower as other plausible alternatives [63].

"Because of what do you call it that the anti –tobacco, okay yeah, so we are also trying to promote industrial hemp. Yeah so that if you fall we don't fall on the hard times and we are also trying to view tobacco as we call it, what was the proper word, we want to develop the processing industry for tobacco. Especially in the direction of production of medicines mostly insulin so as to develop the market the local market for their economy. If the anti-tobacco campaign succeeds, we would have alternatives," (KI 8).

A government sector KI highlighted strategic shifts are needed within the government to keep the money from moving out of the country.

"It's a 1 billion crop but the benefit to the nation, the benefit to the country, the communities and the livelihoods of our people has been very very low. It was literally the funding structure - that it has been funded from offshore….I think we would probably get around 200 million as a country from 1 billion," (KI 7).

Recent research from Zimbabwe indicates that farmers are willing to switch to alternatives if there is adequate profit and dependence on tobacco can be broken with key policies that support alternative crops [63]. Such policies include providing capacity training for growing alternative crops including extension workers to support farmers, strengthening research into alternative crops and strengthening farming models for them [63]. Therefore, the policy infrastructure plays a significant role in deciding the longevity of tobacco in Zimbabwe as an agricultural crop. An economic sector KI pointed this out saying,

"Yes, the market is a factor, but I think market is also can be propped up by policy if you have the policy but then favors a particular crop, what farmers are looking at the end of

the day is return to their investment. If the other crops are also highly paying like tobacco, you can see a shift in that area. If you only look at tobacco is also very labor intensive. It is almost 9 months of preparing. But the other crops (are) more like three months production cycle which can equally be productive with high returns," (KI 19).

Government KIs highlighted that political will remains central to whether or not tobacco will continue to be a key crop and whether the WHO FCTC will be successfully implemented. One noted this saying, *"Let's be honest. It's going to be challenging. Unless the government looks for viable alternatives for the farmers, then, yes, you can now talk about that framework convention," (KI 7).*

Perceived economic benefit remains a central consideration within the decision-making processes of the government, although some within the government recognize that communities do not necessarily economically benefit from tobacco. KIs indicated that creating a better policy environment to facilitate alternative crop production can help smallholder farmers transition from tobacco. While alternatives to tobacco have been considered to an extent, prioritizing alternative crops over tobacco remains unlikely for at least a decade in Zimbabwe.

Discussion:

The political economy of tobacco in Zimbabwe has clear implications for the success of WHO FCTC implementation. Political economy factors such as sanctions imposed on Zimbabwe [64,65] government developmental priorities [59,66], availability of markets for alternative crops [5,19], and the impact of the tobacco industry [19,34,67]. Drawing from our findings, we see three key policy opportunities relevant to both economic and

public health priorities in Zimbabwe: improving public health via demand reduction, prioritizing smallholder farmer wellbeing and addressing deforestation challenges related to tobacco. All three opportunities signal a need for the Zimbabwean government to strongly consider better implementation of the WHO FCTC to achieve demand and supply reduction goals.

First, in terms of public health, the oft repeated argument 'we export but we do not consume' especially by government KIs needs re-examination. As survey data and projected estimates indicate Zimbabwe has a relatively higher prevalence of tobacco use among men and adolescents [12]. As the WHO African regional office indicates, tobacco use among adolescent boys and girls is on the rise in the region, dispelling the common narrative that tobacco use is only high among adolescent boys [54]. Furthermore, research indicates that the susceptibility to tobacco use among adolescents who have never used tobacco before is also high in Zimbabwe [68]. Thus, the available prevalence data on tobacco use in Zimbabwe signals ongoing and worsening public health challenges related to tobacco. Additionally, as KIs indicated, Zimbabwe is also facing unprecedented challenges of substance abuse among youth, leading to significant physical and mental health challenges [69,70]. Research has indicated that tobacco use is associated with future substance abuse among youth [71,72]. The current policy infrastructure in Zimbabwe allows tobacco advertising and sponsorships targeting youth [12,62]. The formation of an inter-ministerial task force and intentionality displayed from the President's office downwards shows that improving the health of youth remains a clear government priority [1,12,70]. Therefore, a potential opportunity for the government is to realistically evaluate and consider the impact of

tobacco among youth (and in the general population). This consideration can be supported by addressing some of the challenges noted by KIs. Viable approaches include assessing and updating prevalence data on tobacco use, increasing WHO FCTC implementation staff (currently one staff member) [12] and safeguarding public health sector staff from industry interference. Given that the government is urgently concerned about the wellbeing of youth, in addition to substance abuse reduction efforts, a policy window is open for the government to consider the necessity of tobacco demand reduction efforts such as regulating marketing, introducing plain packaging, and effectively addressing other tobacco sales efforts targeting youth. Zimbabwe can also learn from policy efforts in regional peer countries such as smoke-free environments and effective taxation policies in Nigeria and South Africa to reduce tobacco consumption [73].

Second, farmer wellbeing is impacted by tobacco. There is a direct negative impact of tobacco farming on health of farmers (and their families) which was stressed by KIs [2,37,74]. This direct impact is worsened by the lack of income for tobacco smallholder farmers or, as KIs indicated, a 'false profit'. Contract farming mechanisms often lead to farmers being trapped in debt cycles [5,49–51]. As indicated by KIs and intergovernmental organizational reports, food security is also a concern and a key priority [32,74]. Given the multi-faceted impacts on the population, political will and novel arrangements are necessary to shift complex agricultural value chains and prioritize wellbeing of farmers and food production [66]. As many KIs pointed out and as government strategy documents indicate, the complete shift from tobacco will take time [15,59]. Yet, Zimbabwe's development strategies can consider incremental policy efforts

[75,76]. Zimbabwe can draw from policy efforts in Zambia and Kenya that supported small groups of farmers to successfully transition to alternative crops [75,76]. In Kenya, the government teamed up with the WHO, the World Food Program (WFP), and the Food and Agriculture Organization to support tobacco farmers to switch from tobacco to high iron beans, including input support and a ready market via WFP's local procurement initiative [77].

Finally, as KIs, government reports and research literature indicate, Zimbabwe is facing a significant environmental challenge of deforestation due to the high demand for wood to support tobacco curing [37,57,58]. Government and industry coalitions have tried to address this challenge but, as KIs have indicated, these efforts are not sufficient. KIs from Zimbabwe identified Malawi as a cautionary tale of deforestation effects due to tobacco farming. However, Zimbabwe too is facing this rising tension of wanting to meet higher tobacco production targets yet safeguard its forests [57,78]. The government announcement in 2021 of the Tobacco Input Revolving Fund of US $ 60 million aimed at providing funds from local sources for tobacco was welcomed by industry stakeholders [79]. This fund (yet to be released) is in line with the government's strategic development goal of making tobacco a US $ 5 billion (with 300 million Kg production per year) crop by 2025 [79,80]. While the minister of agriculture has indicated the target will be reached by post-harvest minimization of loss, as per many KIs and government reports, deforestation remains a concern [56,57,80]. Reaching a higher tobacco output target will also require more energy to cure tobacco and alternative fuels have failed to take hold [58]. In Zimbabwe 62% of Virginia tobacco produced is cured using wood [58].

It is necessary to reassess if policy tools aimed at addressing deforestation such as afforestation levies are effective and whether these levies transfer the burden to already impoverished tobacco farmers. As KIs have indicated and news outlets have reported, there have also been delays and challenges for the funds to reach relevant afforestation stakeholders such as the Forestry Commission [81]. Furthermore, many KIs expressed concerns about insufficient income for farmers. It will be important to consider if added levies will affect the well-being of the farmer by impacting their income. Tobacco farmers' support of the levy is reported to be low with farmers arguing that they are not benefiting from the fund [81,82]. Only 4500ha of gum trees were reported to have been planted by February 2024 [81]. Farmers worry that the slow pace of the initiative could jeopardize Zimbabwe's future access to the European Union (EU) market due to EU's new deforestation related regulations on import commodities [71].

Given the multi-pronged sustainability challenges that the tobacco industry poses, including its heavy environmental cost, strengthening government support for alternative crops could be a potential solution for the government to explore with medium to long term benefits in mind [74]. From a policy and technical support perspective, WHO FCTC Article 17 can provide policy implementation pathways for the government. Article 17, with its focus on viable alternatives, can support the government's existing considerations to diversifying its agricultural product range and protecting its environment [58,83]. In 2023, WHO FCTC released a toolkit for governments and other stakeholders to use to explore policy pathways to strengthen alternative crop production [84]. This toolkit provides resources and clear pathways for situational analysis, understanding factors required to facilitate alternatives, understanding sectoral

contributions to implement Article 17, managing industry interference, and policy options and mechanisms of support for alternative crop production [85]. It also includes a tool for measuring progress of change so that governments can assess the success of their policies in diversifying away from tobacco [85]. As per our study participants, Zimbabwe has already considered diverse agricultural options. The 2022 TIMB strategic plan includes tobacco farmer crop diversification as one of its focal areas, aiming to increase the share of farmer income from alternative crops from 5% in 2022 to 25% in 2025 [86]. Therefore, Zimbabwe can further strengthen its efforts in crop diversification in a manner that complements national development plans. It will not be uncharted territory as Zimbabwe can learn from best practices of other countries (Kenya, Zambia) in the region and use available tools provided by WHO FCTC (Article 17 toolkit) to realistically achieve this stated goal.

The main limitation of our study is the low number of participants from industry. One potential reason is industry viewing academic researchers as biased against the industry. Some potential participants declined our invitation for interviews, given the sensitive nature of the topic and tobacco being a high government priority. Topics related to tobacco can be considered sensitive in Zimbabwe by many due to tobacco farming being a highly politicized topic and an economic priority. Additionally, the interviews were conducted close to a presidential election which may have also affected the inclination to participate given the political nature of the topic. As noted, we also had one participant request not to be recorded even with the knowledge that the data will be anonymized.

Conclusion:

Amidst a complex political economic context, including the historical entrenchment of tobacco growing within the country, the post-land reform shift to smallholder farming as a strategy to strengthen rural economies, and a tumultuous political environment that has led to the imposition of sanctions by several countries, Zimbabwe continues to prioritize tobacco as a key revenue earner. The relationship between tobacco as an economic commodity and limited commitment to tobacco control is apparent. Tobacco continues to pose significant challenges to smallholder farmer wellbeing. Tobacco farming has an impact on tobacco demand reduction efforts and comes with a heavy environmental cost. The current challenges offer the Zimbabwean government an opportunity to pivot away from tobacco and seriously consider alternative options, in order to improve its agricultural economy and protect the wellbeing of its population. It is also vital that global actors recognize the impact of longstanding sanctions and restrictions on Zimbabwe's political economy. Especially, how sanctions may be impeding the development of markets that lessen the importance of tobacco in terms of export earnings.

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Supplementary File 1: Key Informant Interview Guide – Zimbabwe

This is a semi-structured interview guide and all questions will not be used. The interview will be guided by the answers of the interviewees. The identity of the interviewees or organization or ministry will not be used in data analysis or in publications.

Generic questions, all:

1. What are some of the key economic development goals of the country?
    a. What do you think is driving or motivating these goals?
    b. What do you think are the most useful government policies to achieve these goals?
2. What are some of the key social development goals (e.g. in health, education, or environmental protection as outlined in the Sustainable Development Goals) now being pursued by Zimbabwe?
    a. What is driving or motivating these goals?
    b. How would you describe the relationship between economic and social development (sustainable development) goals? (tensions, possible conflicts)
        i. How is the government managing the relationship between economic and social/sustainable development goals or priorities?
        ii. Are there any institutional mechanisms that coordinate or bring together different sectors of government?
3. Where does agricultural policy fit within these differing development goals?
    a. What is your perspective on the future of agribusiness in Zimbabwe?
    b. What crops are the most promising for sustained agricultural development?
    c. How are farmers interests represented in Zimbabwe? (UNAC – farmers union)
        i. How are farmers organized?
    d. What would you identify as recent success stories in the farming sector?
        i. e.g. Which crops have been particularly successful? Why?
        ii. What markers do you look for to determine success?

e. How are the SDGs influencing government policies towards tobacco farming/production or promotion of alternative crops in Zimbabwe? (conserve water, preserve land, reduce hazardous chemical release, increase productivity and income for food producers)

f. What role are the SDGs playing in tobacco control measures in the country?

One of the targets for the health SDG 3 is:

> **3.a** Strengthen the implementation of the WHO Framework Convention on Tobacco Control in all countries, as appropriate.

g. How can the government reconcile population health goals with improving livelihoods of tobacco farmers?

4. What role does tobacco production play within these economic and social (sustainable) development goals? (Probe: Inquire about information sources and evidence base)

    a. What are our thoughts about tobacco farming in Zimbabwe at the present time?

    b. What contribution does tobacco farming make to Zimbabwe's economic development goals (positive, negative, strong, weak…)?

    c. What support does Zimbabwe give to support tobacco growing as an economic development strategy?

    d. What incentives does the government provide to companies to establish tobacco processing and manufacturing (value-added)? (Probe: Ask to identify the policies to this end)

    e. Should Zimbabwe be providing any incentives to tobacco growing or manufacturing?

    f. How does the tobacco industry engage with government around agricultural, trade, tobacco farming or other related policies?

    g. What is the relationship between the government and the tobacco extension worker program? (This may not be relevant)

        i. How do government support for agriculture extend towards tobacco (e.g. input based?)

5. What role do tobacco control measures play within these economic development goals?

    a. What types of tobacco control measures are being pursued by the government?

b. Where do you think the country is moving with tobacco control? Have you heard of the Framework Convention on Tobacco Control? What do you know about this treaty?

c. What are some of the most promising tobacco control measures that could be considered by Zimbabwe (e.g. smoking restrictions, marketing restrictions, sponsorship restrictions, taxation [excise] policies, incentivizing alternative livelihoods)?

d. Which of these measures are most likely to get widespread support and implementation?

e. What is the status of tobacco consumption within Zimbabwe? (increasing, decreasing, about the same as for the past several years)

6. How would you describe the longer-term prospect of tobacco farming in Zimbabwe?

    a. What policies would you say would improve livelihoods of tobacco farmers?

    b. What policies is Zimbabwe currently pursuing to improve both the health and the livelihoods of tobacco farmers?

    c. How important do you think incentivizing alternative crops to tobacco would be to improve both the health and the livelihoods of tobacco farmers?

7. Relationship between private sector and government?
    a. Can you tell me about the private sector entities that you interact with in your work?
    b. What types of issues do you typically discuss?
    c. Are there formal mechanisms in place to facilitate these interactions?

Additional questions/probes by interview group:

For *health* informants additional questions:

1. What is the up to date status of tobacco control measures in Zimbabwe

2. How effective do you find engagement with other ministries whose primary concern is with economic development (or agricultural growth, trade, tobacco production/export (e.g. focus on the inter-ministerial liaison committee)?

3. How do they view tobacco control measures alongside the economics of tobacco farming?

4. What role are the new SDGs playing in advancing tobacco control measures in the country, or in improving engagement with other government sectors?

5. Can you describe your relationship with non-governmental organizations? Can you tell us of a time when this relationship helped move tobacco control forward?

For *tobacco farmer/industry* informants

1. How is the tobacco leaf industry doing in Zimbabwe at the moment (growing, declining, about the same as in recent years)?

2. How do they engage with governments in promoting the livelihoods of tobacco farmers?

3. How do they work with the tobacco industry or leaf-buyers to protect the livelihoods of tobacco farmers?

4. What activities do they undertake with tobacco farmers themselves to support their livelihoods?

5. How important is tobacco growing to the livelihoods of tobacco farmers?

6. How does tobacco compare with other crops or economic activities for the livelihoods of farmers?

7. How are you involved in identifying alternative crops to tobacco?

8. What concerns do you have in how tobacco control measures adopted by Zimbabwe might affect the livelihoods of tobacco farmers?

For *COMESA, SADC, WTO (+ bilaterals, mainly with countries in the region)*

1. How important is tobacco leaf production (tobacco manufacturing) in Zimbabwe's regional and international trade?

2. How are tobacco control measures viewed within regional and international trade policy or agreements?

3. What positions on tobacco control measures have been taken (in COMESA, in SADC, by Zimbabwe at the WTO)? Can you tell us of a notable experience in one of these meetings where tobacco was discussed? What was happening? What was said?

4. How are tensions between tobacco control measures and tobacco trade being managed?

5. How do you see the economic agreements in which Zimbabwe participates (in COMESA, SADC, or WTO) improving the livelihoods of tobacco farmers?

6. How do you see the economic agreements in which Zimbabwe participates (in COMESA, SADC, or WTO) or in incentivizing a shift to alternative crops?

7. Do you think that these agreements have any impact on tobacco production and tobacco control? If so, how?

Bridging Text: Chapters 6 to 7

Tobacco farming has several negative implications for health, economy and environment including environmental degradation, deforestation, farmer wellbeing and influence on demand reduction. These factors illustrate the importance of identifying clear policy pathways for supply reduction. Supply reduction is especially relevant for countries such as Zimbabwe that are heavily dependent on tobacco whilst facing challenges such as deforestation and limited benefits to farmer economic wellbeing while posing significant health and social problems to households. The African region, a target market for the tobacco industry also has four of the top ten tobacco producing countries in the world.

In this next chapter, using both existing literature and expert input, I examine potential policy pathways for supply reduction in the African region. Policy pathways benefit from examining the context, existing policy content or guidance for supply reduction policy, the processes for policy making, and key relevant actors. This chapter will use Walt and Gilson's Health Policy Triangle to examine the context of policy making, policy content related to supply reduction, relevant processes for policy making and previous exemplar processes and actors that matter in supply reduction policy. I included academic literature focused on supply reduction policy in the African region. I used grey literature to examine the latest tobacco production related economic data, supply reduction policy, food security and tobacco use prevalence data. The experts included were all tobacco control experts either globally, nationally or regionally, with at least 5 years of experience. The majority of the experts were engaged in supply reduction efforts.

The findings of this chapter can be used as a starting point to build country specific policy pathways for supply reduction in the African region. These findings can also be applied to other countries in the world facing similar challenges related to tobacco farming. These challenges include dependence on tobacco farming as an economic strategy, long historical legacy of tobacco farming, poor economic returns for smallholder farmers, negative health impacts of tobacco farming and overall barriers strong presence of tobacco industry causes for demand reduction effort.

Chapter 7: Manuscript Three - Policy pathways for tobacco supply reduction in the African region – a Health Policy Triangle Analysis

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Abstract:

According to the World Health Organization Framework Convention of Tobacco Control (WHO FCTC) impact reports and progress reports, tobacco supply reduction needs strengthening. Currently, four out of top ten global tobacco producing countries are located in the African region, which is the highest in any global region. Additionally, research has indicated that industry is targeting the African region as a market for tobacco use and for tobacco production. Countries such as Zimbabwe, Malawi, Zambia are heavily dependent on foreign currency earned via tobacco exports. However, rising tobacco use among youth, challenges to farmer wellbeing (including health and economic challenges), environmental challenges (rapid deforestation, soil nutrient degradation) are posing significant challenges to both population and planetary health. Therefore, there is a necessity to find policy pathways for supply reduction. This, research examines the current context, existing policy content, policy processes and actors, to outline policy pathways for supply reduction in the African region. Special focus is given to the top five tobacco producing countries in the region.

We use a mix of data sources including academic literature and grey literature published between 2013-2024 inclusive of the starting and ending years. For academic literature we used Scopus and five ProQuest databases to capture all supply reduction policy related articles. For grey literature we used purposive selection of sites (e.g., WHO FCTC, WHO, World Food Program) that are relevant to supply reduction. We also administered a short survey to gain tobacco control expert input on supply reduction policy pathways in the African region. We used Walt and Gilson's Health Policy Triangle as our analytical framework and also to structure our paper.

Findings indicate that main pathways for supply reduction in agricultural based economies, such as the top five tobacco growing countries in the African region, lie within strengthening opportunity, resources and capacity to transition towards alternative crops. The strengthening of financial infrastructure for alternative crops, establishing profitable markets and removing government subsidies for the tobacco industry are key steps for this transition. Policy formulation can be drawn from key exemplars and technical guidance resources (e.g. WHO FCTC toolkits). However, policy processes are heavily dependent on leveraging existing evidence on the harms of tobacco farming and economic potential of alternatives to convince decision makers. Pathways for successful processes are dependent on actor synergy within research, civil society, and governance actors. While the research focuses on the African region, the findings of this research have implications for tobacco producing countries globally.

Introduction:

The World Health Organization Framework Convention of Tobacco Control (WHO FCTC) came into force in 2005 [1,2]. In the WHO African region (African region from here on), 45 out of 47 countries have either ratified or acceded to the WHO FCTC [3,4]. The progress and impact reports of the WHO FCTC indicate that implementation of supply reduction measures (tobacco farming reduction, providing economically viable alternatives) continues to lag behind demand reduction measures [1,5,6]. The most recent progress reports of the WHO FCTC of 2021 and 2023 both highlight that Article 17 (provision of support for economically viable alternatives), and Article 18 (protection of the environment and the health of persons) are weakly implemented in countries that grow tobacco [5,6].

Based on most recent data (2022) of the Food and Agriculture Organization (FAO) of the United Nations (UN), the current top ten producers of unmanufactured tobacco in the African region in descending order are Zimbabwe, Malawi, Mozambique, United Republic of Tanzania (Tanzania from here on), Zambia, Uganda, Kenya, Algeria, South Africa, and Côte d'Ivoire [7]. Many countries in the region recognize the limited benefits of tobacco growing as an economic strategy, while for most, tobacco remains deeply entrenched in their countries' political economy. For example, the government of Zimbabwe, a signatory to the WHO FCTC, has indicated that they wish to increase tobacco production to 300,000 metric tons from 2024 onwards [8]. In 2023, Zimbabwe recorded the country's largest ever output of 296,100 metric tons and it exported 233,896 metric tons earning US $ 1.2 billion [9]. However, in 2024, this number is expected to decrease due to drought related challenges indicating the dependence on climate conditions for tobacco and the uncertainty of output [10]. In November 2023, the Framework Convention Secretariat with other UN agencies released a toolkit for Article 17 to support efforts of countries and other stakeholders to facilitate alternatives to tobacco growing [11]. As the example from Zimbabwe illustrates, many countries continue to struggle between a policy of promotion and one of control, between tobacco as an economic commodity and as a health-harming product.

The rationales for pursuing alternatives to tobacco growing are numerous. Tobacco farming has been shown to be problematic from an economic, health, and environmental perspective. Tobacco is currently grown in 124 countries, with 4 of the top ten tobacco growing countries located in the African region [12,13]. Tobacco growing uses 3.2 million hectares of land globally which has the potential to be used for

food production [12]. An estimated 29.7% of the world population (2.4 billion) faced moderate to severe food insecurity in 2022 [14]. The majority of those affected by food insecurity live in low- and middle-income countries [15–17]. While many smallholder farmers grow tobacco to gain cash for their daily needs, including food purchasing, research indicates that tobacco farming is not profitable for smallholder farmers, often trapping them in debt cycles (18–22). Countries such as Zimbabwe, Malawi and Zambia continue to depend on tobacco as a key economic commodity even though smallholder tobacco farmers continue to face economic challenges due to low income [12,18–20]. Tobacco farming is also known to cause health challenges for farmers and those handling tobacco leaves [21–23]. These health risks include green tobacco sickness, exposure to tobacco dust and exposure to heavy use of pesticides [12,21–23]. Furthermore, tobacco farming and its production processes have significant negative impacts on the environment including deforestation, soil degradation and contaminating water sources [21,24,25]. The World Health Organization (WHO) has continued to highlight these challenges to tobacco farmers' health, the negative impact on the environment and its contribution towards food insecurity [12,26]. Drawing from the growing evidence base outlined above, researchers have argued that the future of agricultural-based economies should move away from tobacco [13]. Moving away from tobacco also aligns with the overarching objective of the Sustainable Development Goals (SDGs) to transform global systems in pursuit of more sustainable and healthy agricultural production [13]. Additionally, it aligns with SDG target 3.a focused on strengthening the implementation of the WHO FCTC in all countries [27,28].

At the same time, the African region remains a target market for the tobacco industry [18,29]. Researchers have noted that this is partly due to its growing youthful population, with Africa's population expected to double by 2050 [30]. As youth demographic is a target for tobacco sales this is a business imperative for Transnational Tobacco Companies (TTC) to strengthen their presence and establish more markets [31]. A recent study found an increase in tobacco use among youth in 63 of the 135 countries surveyed and highlighted that the tobacco industry continues to target new markets in the African region [32]. With increasing regulations around the world, the relative low prevalence of tobacco use in the African region, interconnected lack of regulations, has provided a window of opportunity for TTC to aggressively market tobacco to youth in the region [30,33].The African region is one of two WHO regions that continues to see increases in the absolute numbers of smokers [32]. A recent analysis focused on 22 African countries using Global Youth Tobacco Survey from 2013-18 for adolescents aged 11-17 years old, indicated that tobacco use and non-user susceptibility to using tobacco products among school-going adolescents are high [34]. Findings indicated that one in ten school-going adolescents in the 22 African countries within the study were current cigarette smokers [34]. Important linkages have been found between rising tobacco use in the African region and the presence of tobacco farming [19]. The success of the tobacco industry in promoting tobacco production as an important contribution to economic development, built on historical and institutional legacies, has created a strong foundation for the industry to oppose tobacco control policies [19,35,36]. The tobacco industry's influence is heightened because of the relative limited power that health ministries wield within governments [19]. In many

countries, relevant ministries fail to coordinate and/or cooperate on policies to mitigate tobacco production and use [18,19,37,38]. . The tobacco industry's Corporate Social Responsibility (CSR) projects also act as barriers to effectively implementing tobacco control efforts [39]. CSR activities and the publicization of such projects help tobacco companies to position themselves as contributors to the wellbeing of society, when in fact the opposite is true [40].

There remains a pressing need to analyze available knowledge and use the findings to chart potential policy pathways towards tobacco supply reduction. Given the importance of tobacco growing in many African countries, and the notable ways that the persistence of tobacco growing has enabled tobacco industry efforts to expand the tobacco market. This paper focuses on policy pathways to advance supply reduction in the African region. We draw from literature on supply reduction policy in the African region and primary data collected via surveys of global, regional and country level experts on the topic, to identify promising policy approaches. We use Walt and Gilson's Health Policy Triangle as an analytic framework to organize information and outline potential policy pathways. Particular focus is placed on the top five tobacco producing countries in the region given their output of and economic dependence on tobacco.

Methods:

We use explanatory case study methodology to understand the case of tobacco supply reduction policy implementation in the African region. Case study methodology helps to "generate an in-depth, multi-faceted understanding of a complex issue in its real-life context," [41]. We specifically use Yin's explanatory case study approach as it allows us

to outline underlying factors affecting causal pathways and the resulting causal pathways related to tobacco control processes. This approach also helps explain actions that have been taken to address tobacco supply and factors that perpetuate tobacco growing [42,43]. Finally, case study methodology allows us to use multiple and diverse data sources which is necessary to examine intersecting factors that contribute to challenges and potential policy pathways for supply reduction in the African region. Our data sources are as follows: a) grey literature from January 1, 2013 – March 27, 2024; b) academic literature from January 1, 2013 - March 27, 2024; and c) short survey data from tobacco supply reduction experts (completed within March 2024). We chose to focus on the literature published from 2013-2024, approximately the last decade, inclusive of the years 2013 and 2024 (till March 27).

For grey literature, we used a purposive approach targeting websites that focus on tobacco supply reduction and sites that consolidate research data. The websites we used include WHO Knowledge Hub for Article 17 and 18, WHO Knowledge Hub on Article 5.3, WHO FCTC Secretariat, Tobacconomics, Tobacco Atlas, STOP - a global tobacco industry watchdog, African Tobacco Control Alliance, Tobacco Industry Interference Index, Tobacco Tactics, Tobacco Free Farms, FAO, and World Food Program (WFP). Examples of reports include country level research reports on supply reduction available in sites such as Tobacconomics and Tobacco Tactics, progress reports of the WHO FCTC, WHO Reports on tobacco farming, and country specific data from UN (WHO, FAO, WFP) and World Bank data repositories.

For academic literature, we searched Scopus and Proquest databases (PAIS Index, Health & Medical Collection, Policy File Index, Political Science Database, Public Health

Database). The inclusion-exclusion criteria are outlined in Table 1. We used Rayyan online software to screen the titles and abstracts in academic literature and select articles related to tobacco supply reduction policy in the African region. We had a total of 183 articles from all the academic database search results. During the screening process we removed 30 duplicates and 120 articles based on title and abstract screening. We reviewed 33 articles in full text screening and included a final number of 27 articles for this study. PRISMA diagram for this study and relevant search strings for academic databases are included in Supplementary File 1. We excluded six articles upon full text reading as those articles focused only on demand reduction aspects and policies. We used a data extraction table for extraction of data related to supply reduction context, policies, policy processes and actors from the final 27 articles.

Table 1: Inclusion, exclusion criteria for academic literature

Inclusion Criteria	**Exclusion Criteria**
Academic publications in peer-reviewed journals including original research, reviews, commentaries, and editorials	Articles in non-peer reviewed journals, books, thesis reports and conference presentations
Published between January 1, 2013 – March 27, 2024, inclusive of 2013 and 2024	Published prior to 2013
Focused on national level tobacco supply reduction policies	Not focused on national level tobacco supply reduction policies (e.g., prevalence studies, tobacco demand reduction related, non-policy focused)
Focused on the WHO African region	Not focused on the WHO African region
Article written in English	Articles not written in English

To gain expert input, we administered a short survey (Supplementary File 2) focused on supply reduction policy challenges and policy pathways for countries in the African region. We used purposive sampling to identify the experts, and we prioritized those with regional or global level experience, with over 2 years of experience in the field. We sent out 20 invitations to tobacco control experts who focused on implementation.

Fifteen of these experts focused more on supply reduction and 5 focused more on demand reduction. We received responses from 10 supply reduction focused experts. Most experts who responded (9) have over 5 years of experience in the field of tobacco control. All experts are involved in research, policy, and/or programs on tobacco supply reduction. Four experts wished to remain anonymous and the six experts who consented to sharing their names and positions are included in Supplementary File 3. We collected data centered around five main areas: best global practices in supply reduction, key challenges for supply reduction in the African region, support required from regional and international partners for supply reduction in the African region, best policy practices for supply reduction in the African region, and additional key considerations for the implementation of Article 17 of the WHO FCTC in the African region.

The analysis combined data sources and used HPT which operates with the categories of actors, context, and processes in addition to the content of policies [44]. Our analytical approach included three steps. First, we examined the literature (grey and academic) and noted the common and recurring themes relevant to supply reduction under the main HPT components of context, content, and processes. The main goal in this process was to identify key factors pertaining to policy pathways in terms of context, available key contents of policies relevant to supply reduction and policy processes relevant to supply reduction. Based on the data identified within the literature we also identified key relevant actors for supply reduction.

Second, we examined relevant databases and literature for additional research evidence (e.g., prevalence data, tobacco production data, policy exemplars, national

level policy processes, key actors) related to the common themes identified. In our analytical reporting we took a narrative approach to outline key themes and connect them to research evidence. Third, we used expert input that we received via surveys to add additional aspects related to policy pathways under each of the HPT components. Our goal in this process was to compare the collated data from the literature and fill in any gaps related to policy pathways using the perspectives of experts on research and practice of supply reduction.

Using HPT as our main analytic reporting foundation, we outline supply reduction pathway considerations under each of the HPT components. Under the *context component* of the HPT, we provide an overview of context related to supply reduction challenges and policy pathways in the African region. Under the *content component* we examine existing supply reduction policy pathways, related key initiatives, and impending policies. Policy content within this analysis will not include demand reduction policies. However, we outline key exemplar policy countering tobacco industry interference in the African region as it is relevant to supply reduction. Under the *processes component* we examine key supply reduction policy processes and, where relevant, pathways to enacting national level comprehensive tobacco control policies. For the processes component we use Kingdon's multiple streams framework (politics, problem, and policy streams) to organize the data reviewed and to examine pathways [45]. Multiple streams framework posits that for policy change the three streams need to intersect or align creating an opportunity for policy change [45]. Use of Kingdon's multiple streams in this study (under the process component of HPT) is helpful to clearly outline the non-linear aspects of policy making and challenges related to lack of

alignment between government agendas and problems arising due to tobacco farming. It also allows us to examine the status of each stream (politics, problem, and policy) and factors affecting those streams, which in turn affect policy pathways. Under the *actor(s) component* we examine key actors relevant for supply reduction policy pathways. Given the interconnected nature of the four components some considerations for policy pathways can recur within components. This is an important analytical observation that underscores the necessity to approach certain policy pathways from multiple aspects.

While the analysis uses the African region as the overall case, we will give focused attention to the top five tobacco producing countries in the region. This analytical decision is based on economic dependence of the top five tobacco producing African countries on tobacco as an economic commodity. These five countries are Zimbabwe, Malawi, Mozambique, Tanzania, and Zambia [7].

Results and Discussion

As noted in the methods section, the results are organized based on the HPT components, context, process, content, and actors. Based on our results we also highlight additional key discussion points related to advancing supply reduction policy pathways.

Context related pathways for supply reduction

Based on data analysis we note three prevailing key contextual themes that are embedded in political, economic, and public health discourse in relation to tobacco production and control in the African region: the low prevalence of tobacco use in the region, used by governments and industry as a key factor to justify tobacco growing as

harmless to local communities [19,29,30,37] the economic dependence on tobacco by countries in the African region and the interconnected claim that tobacco is beneficial for smallholder farmers as a source of income [19,37] the strong presence of the tobacco industry within the region and their ability to influence policies [29,30].

First, even though the African region has the lowest prevalence of tobacco use compared to other WHO regions, there is a sharp rise in tobacco use especially among youth [30,32,33,46]. Smoking prevalence in the African region is projected to have the fastest growth compared to any other region globally [29]. This projection is supported by analyses indicating that the African region is one of the regions where the absolute number of smokers continues to increase [30,32]. The African region has seen a steady increase of smokers, with an estimated 52 million in 2000, 66 million in 2015 and a projected 84 million in 2025 [30,47]. Tobacco use among adolescents is a key challenge in the African region [48]. Tobacco use among girls has increased in recent times. Thus, while tobacco use prevalence among boys remains a significant challenge (7.8% to 36.5%), tobacco use prevalence among girls (4.6% to 36.6%) has now become a serious challenge as well[48]. Considering the top five tobacco-growing countries documented in the most recent (2023) WHO country reports on the tobacco epidemic, Zambia has the highest estimated prevalence of tobacco use for men above 15 years at 25.9% while Tanzania has the lowest at 16.1% [49–53]. Table 2 summarizes the prevalence data for each country, including the prevalence of tobacco use among youth. The latest estimations for the overall prevalence of tobacco use (smokeless and smoking) were calculated by WHO in 2021 using data from 1990 – 2020 [49–53]. However, Mozambique estimations for overall use are not available in the latest country

report [51]. The Global Tobacco Progress Report 2023 indicates that Mozambique's prevalence of smoking is 21.9% and 2.9% among adult men and women respectively [46].

Table 2: Tobacco use prevalence in the top five tobacco producing countries in Africa

Sources: WHO Tobacco Agriculture and Trade Country Reports (2022) and Country Profiles from the WHO Report on the Global Tobacco Epidemic (2023)

Country	Prevalence estimation of tobacco use (2021)		Proportion of death attributable to tobacco use - aged 25 years or more (2019) %	Prevalence – Youth (13- 15 years) (survey year) %
	Men (over 15 years) %	Women (over 15 years) %		
Malawi	16.9	3.2	7	14.2 (2009)
Mozambique	-	-	6	5.2 (2015)
Tanzania	16.1	3.4	10	4.8 (2016)
Zambia	25.9	3.7	7	25.6 (2011)
Zimbabwe	21.9	1.2	11	20 (2014)

Latest data indicate 20% tobacco use among all adolescents aged 13 - 15 years and 21.9 % tobacco use among men in Zimbabwe [53]. The growing public health risk due to tobacco in the African region is a key contextual factor relevant to policymaking in national governments in relation to supply and demand reduction.

Second, tobacco is a prominent economic commodity within the African region. Between 2012-18, the acreage of tobacco farming in the region increased by 3.4% and the production quantity increased by 10.6% [54]. This increase runs counter to the global trend of reductions in tobacco leaf production and land use [54]. Based on the latest land use estimates (2021) four of the top ten tobacco-growing countries in the world are in the African region (Table 3) - Zimbabwe, Malawi, Mozambique, and Tanzania [12,55]. No other WHO region in the world has more than two countries in the top ten, which is likely strongly related to the pervasive government support for tobacco farming and strong industry presence in the African region [12,55]. Zambia ranks 22 on

the global top 50 tobacco-growing country list based on land use [12,55]. The prevailing industry narrative that tobacco is a lucrative economic commodity for smallholder farmers has been empirically debunked by research conducted in Zimbabwe, Kenya, Malawi, and Zambia [56–62]. Research indicates that farmers choose tobacco due to lack of other options, as tobacco companies provide a well-established supply chain and financial support such as loans [19,57,59,60,62]. However, despite the established supply chain tobacco, farmers often end up in debt with contracting companies and trapped in debt cycles due to low profit, obliging them to continue farming tobacco [19,56–60,62]. The reasons for low profit from tobacco include artificially high production costs, low and unstable prices, and diminished earnings or even losses once production and labor costs are accounted for [19,56–60,62]. In Kenya, according to Institute for Natural Resource and Technology Studies case study assessments in 2007, tobacco cultivation has the lowest economic return per acre compared to other commercial crops such as passion fruit, watermelon, soybeans, pineapples, and peppers [37].

Research indicates that information deficit on the true cost of tobacco production among health ministry stakeholders and smallholder farmers allows strong voices of tobacco industry to promote tobacco being profitable [19]. The information deficit, farming contracts and lack of supply reduction pathways are also influenced by key power asymmetries. These power asymmetries occur within government ministries (e.g., finance prioritized over health) at the governance level [19,37]. Additionally, these power asymmetries also occur between TTCs, who usually have government backing and smallholder farmers (and their families) who are dependent on these companies for inputs and selling of tobacco [19,37]. Additionally, research highlights the impact of

tobacco farming on food security as an important policy consideration within national development agendas [13,37]. Currently, all the top five tobacco growing countries are given a ranking of 'serious' food insecurity (Table 3) based on the Global Hunger Index with a rating system of *low, moderate, serious, alarming, and extremely alarming* [63]. The index considers undernourishment of the population, child stunting, child wasting and child mortality data to calculate the rankings (63). Table 3 summarizes the tobacco production, export, land use data and the food insecurity data from each of the top five tobacco producers in Africa [7,63–68].

Table 3: Tobacco farming and food security statistics of the top five tobacco producing countries in Africa

Sources: FAO data, Global Hunger Index (2023), WHO Country Reports on Tobacco Agriculture and Trade (2022)

Country	Tobacco leaf output based on FAO (metric tons) E- Estimated, A- Official, I- Imputed		Tobacco leaf as a proportion of total exports (2020) %	Trend: tobacco area harvested (2000-2020) %	Tobacco farming area (hectares) (2021)	Rank in Global Hunger Index (2023) Out of 125
	2020	2022				
Malawi	102,000 (E)	103,805 (I)	52.54	- 13. 01 (decrease)	100,962	88
Mozambique	67,000 (A)	95,516 (I)	4.68	524.04	91,469	113
Tanzania	37, 546 (A)	61,636 (I)	2.45	38.14	80,678	94
Zambia	53, 937 (A)	38,738.07 (I)	1.39	71.73	15,159	110
Zimbabwe	203, 488 (A)	166,918.74 (I)	16.87	15.41	112,770	107

In our expert survey, 8 out of 10 informants indicated that key challenges included lack of viable alternatives and lack of policy support to develop viable alternatives in top tobacco-growing countries. Policy infrastructure challenges indicated by experts include lack of effective financing options for farmers, budget cuts by governments for livelihood improvement, and lack of market establishment or market opportunity assessment efforts for alternative crops. Continued framing of tobacco as a lucrative crop and interconnected power asymmetries at national levels are key factors shaping supply

reduction policies in the African region. This is especially true for top tobacco growing countries whose economies are strongly influenced by tobacco production.

Third, the pervasive industry presence has been a defining factor in the region for both supply and demand reduction [29,38,69,70]. The African region presents the biggest growth potential for industry due to predicted increases in tobacco use prevalence including women and adolescents as key consumers [71]. The main TTCs in the African region include Philip Morris International, British American Tobacco, Imperial Brands and Japan Tobacco International [29]. Industry interference takes many approaches including directly influencing government processes and tobacco control laws (e.g., Nigeria, Ethiopia, Zimbabwe), using CSR for image building (e.g., Mozambique, Uganda), promotional giveaways (e.g., Botswana, Senegal), signing memorandums of understanding with law enforcement agencies (e.g., South Africa, Mozambique, Ghana), using third party or front groups (Zambia, Ghana), and using litigation (e.g., Kenya, Uganda, Namibia) [20,29,33,39,69,71,72]. In the region, based on the tobacco industry interference index, Cameroon has the highest level of tobacco industry interference, followed by Tanzania, Zambia, Madagascar and Mozambique [73]. Zimbabwe and Malawi are not included in the index [73]. Some of the tobacco industry front groups in the region include Free Market Foundation in South Africa, Imani Center for Policy and Education in Ghana and Zambia Chamber of Commerce and Industry (ZACCI)[72]. Free Market Foundation(South Africa)has clear corporate links to TTCs and has opposed tobacco control policies and defended tobacco marketing. The Imani Center for Policy and Education (Ghana) has publicly opposed tobacco taxes, smoking bans and have challenged the link between lung cancer and smoking. Similarly ZACCI

lobbied the government of Zambia on behalf of tobacco corporations and oppose tobacco control regulations [72].

The strong presence of industry in all the top five tobacco growing countries plays a significant role in impeding supply reduction efforts. Zimbabwe's political leadership in the past has publicly declared its support for the industry and have continued to prioritize tobacco in government development plans [20,74]. Zimbabwe in 2021 announced more government funds to strengthen tobacco via Tobacco Input Revolving Fund of US $ 60 million [75]. In both Malawi and Zambia tobacco farming was specifically included as part of their immediately previous five year strategy plans [76,77]. The government of Tanzania has provided subsidies to increase tobacco production and provided favorable tax conditions for leaf buying companies within the last five years [73]. In Zambia, tobacco companies have received government awards for their CSR activities [73]. Bi-lateral relationships, such as agreements between China and Zimbabwe have allowed tobacco companies to establish a strong in-country presence (e.g., China National Tobacco Company) [78]. The experts that we surveyed concurred with reported findings, ranking industry interference as a top five challenge. They also indicated that tobacco company contributions to government via lobbying efforts, companies appropriating narratives on sustainable development and crop diversification, industry manipulating farmers to be front groups, and consistent industry influence within government, were key challenges related to supply reduction. Given this context, especially in tobacco growing countries, supply reduction faces marked uphill battles. These uphill battles are directly linked to having to contend with industry and governments that back tobacco industry efforts within the country.

Based on contextual data and expert opinion we highlight three supply reduction priority pathways within the context section. First priority pathway is strengthening efforts to alter perceptions that tobacco-growing countries in the African region have low rates of tobacco use. Strengthening advocacy highlighting the rising public health crisis and associated projected costs on health systems of increased tobacco use in tobacco-growing countries and the region, can help shift political priorities within countries. This can be achieved via further publicizing research findings on tobacco use prevalence, and current and projected costs of managing tobacco related health problems. Some pathways for publicization include strengthening inter-ministry communication and using mainstream and social media targeting youth. Regular policy briefs on the political economy of tobacco in tobacco-growing countries might also be helpful as would policy advocacy led by regional bodies with visibility such as Africa Center for Disease Control (Africa CDC) that signals the necessity of supply reduction to achieve tobacco control and to reduce non-communicable diseases (NCDs).

Second priority pathway requires more focus on examining the wellbeing of smallholder tobacco farmers. Farmer wellbeing should not be limited to bio-medical health challenges such as green tobacco sickness but embrace a holistic perspective. Our contextual analysis, for example, indicates increased poverty and food insecurity as key relevant social determinants of health for tobacco farmers. Working closely with farmers and gaining the support of the community should be considered a vital aspect of examining the impact of and pathways out of tobacco farming.

The third priority pathway is to build stronger alignment between advocacy organizations in the African region, government actors (e.g., health, agriculture,

finance), academia and intergovernmental organizations. This includes strengthening synergies between in-country civil society, government actors, tobacco control academic researchers, and intergovernmental organizations to specifically highlight that tobacco farming is not without significant opportunity costs. Contextual analysis on tobacco farming has been a focus of academic and intergovernmental research. However, as outlined above, more context-specific advocacy with key government stakeholders and the general public is necessary. Coalitions consisting of aforementioned stakeholders can strengthen context-specific understanding and advocacy. Industry interference has been a strong focus of many tobacco control advocates and organizations. More effort is needed to include countries such as Zimbabwe and Malawi on research-based indexes such as the tobacco industry interference index. Strengthening advocacy partners and the dissemination of evidence-informed policy recommendations are cross-cutting pathways to shift political narratives and counter industry interference efforts.

Overall, two major policy imperatives for better tobacco control can be highlighted based on the above context. One is deteriorating smallholder tobacco farmer wellbeing due to diminishing income and impact on health. And the other is the growing national prevalence of tobacco use and its impact on adolescents. While these two policy imperatives should push governments to improve tobacco control there are several other contextual factors that impede tobacco control. The most prominent factor is the continued economic dependence at the macro level as a foreign income earner by tobacco growing countries. Another interconnected impeding factor is government prioritization of tobacco as an economic commodity and a corresponding absence of

policy infrastructure to move towards alternative crops and livelihood options. From a functional standpoint institutional integration of tobacco to national development plans pose significant barriers including institutional incongruence for tobacco control. Tobacco industry interference cuts across both supply and demand reduction. The financial, political, and social capital of the industry, and well-established industry tactics to interfere with policies and policy implementation are barriers to tobacco control. As the African region continues to be targeted by the tobacco industry, addressing these contextual factors will be vital.

Policy content related pathways for supply reduction

The focus of the content section will be on overall in-country norm setting by acceding to the WHO FCTC, supply reduction policies, and exemplar policies countering industry interference.

As of April 2024, 45 out of 47 countries in the African region have signed-on to the WHO FCTC with Malawi being the latest country [48,79]. As of November 2023, 22 countries in the region are party to the Protocol to Eliminate Illicit Trade in Tobacco Products [80]. As parties to the WHO FCTC, countries must implement Article 17 focused on providing economically sustainable alternatives to tobacco production (12,71). All the top five tobacco growing countries in the African region have acceded to the WHO FCTC [6,46].

Based on 2023 WHO FCTC Progress Report, among the 14 African countries listed within the top 50 tobacco-growing countries in the world, only four have reported implementing measures related to Article 17 [6,55]. Malawi, at the time of data collection

for the report, had not acceded to WHO FCTC [6]. Six countries have indicated in the reporting instrument as not growing tobacco and three have indicated that they have no measures to implement Article 17 [6]. Table 4 presents the number of measures taken by the 14 African countries (among the top 50 tobacco growers) to implement Article 17. Out of the top five tobacco producing countries in the region, only Zambia has indicated policy measures to implement Article 17 [6].

Table 4: Article 17 implementation measures among African countries within the top 50 global tobacco growing countries

Source: WHO FCTC Progress Report 2023 (Annex 2) and WHO World Tobacco Day Report 2023

Countries in the African Region of the top 50 tobacco growers in the world (ordered based on land allocation for tobacco farming)	**Measures taken to implement Article 17 (as reported in WHO FCTC Progress Report 2023)**
Zimbabwe	0
Malawi	Not acceded at the time of reporting
Mozambique	Indicated as not growing tobacco
Tanzania	Indicated as not growing tobacco
Uganda	1
Côte d'Ivoire	Indicated as not growing tobacco
Kenya	Indicated as not growing tobacco
Zambia	1
Nigeria	2
Democratic Republic of Congo	0
Ghana	Indicated as not growing tobacco
South Africa	0
Togo	Indicated as not growing tobacco
Cameroon	1

Despite incomplete reporting strategies employed by countries, there are policy exemplars on the implementation of Article 17 within the region. Kenya and Zambia are two countries that implemented measures on Article 17 through the tobacco free farms initiative [13,81,82]. The initiative is a partnership among WHO, FAO, WFP, and country governments [82] that addresses key issues such as shifting from tobacco including a viable alternative crop (e.g., high iron beans), financing for inputs and other production costs, and identifying a clear and stable supply chain for selling the harvest [13,81,83].

Additionally, training was also provided to farmers to start growing alternative crops. While this addresses Article 17 implementation, it is also relevant to Article 18 in terms of environmental protection [82]. The initiative started in Migori county, Kenya, has now expanded to Meru, Busia, and Bungoma counties in Kenya, and the eastern province of Zambia [83]. The target goals set for the end of 2024 include converting 4000 farmers across Kenya and 1000 farmers in Zambia to farm alternative crops and enabling a 200% annual income increase for 80% of the farmers who switch to alternative crops [83]. In Migori county, Kenya, the initiative had 1400 farmers switching to alternative crops over four growing seasons [83]. These exemplars bring in multi-stakeholder coalitions to address key requirements for switching to alternatives such as financing for farmers and a viable supply chain connected to a profitable market [13].

It is also necessary to implement Article 5.3 along with Article 17 to counter industry interference that can otherwise derail policy implementation of any WHO FCTC Article [37,38]. Uganda stands out as a policy exemplar for enacting a national law that includes a specific section on conflicts of interest regarding the tobacco industry [84]. Other examples include banning of tobacco industry-related CSR activity in Chad, Ethiopia, Gabon, Guinea, Madagascar, Mauritius, Niger, Seychelles, Togo, and Uganda [85]. Based on the Industry Interference Index 2023, Burkina Faso, Botswana, and Ethiopia have made improvements in countering industry influence [73]. However, since 2020, Zambia, Tanzania, and Mozambique (Zimbabwe and Malawi are not in the index) have reported high level tobacco industry interference across all metrics of the index [73]. Zambia and Tanzania, along with Cameroon had the highest industry influence on policy making [73]. Policy content can also address tax breaks, legalization of

sponsorship and delays in implementation of tobacco control law. These types of challenges were observed in Nigeria, Gabon, Tanzania, Kenya, South Africa, and Zambia [73].

There was consensus among the experts we surveyed on the necessity to include tobacco industry interference as a priority policy option in supply reduction policies. Additionally, they recommended discontinuing government budget allocations for tobacco farming, providing incentives to farmers to switch to alternatives, ensuring robust financial infrastructure to support farmers (e.g., support for production, supply chains and availability of markets), capacity building of farmers and making alternative crop farming a priority policy agenda item within governments. National and sub-national level policy content is necessary to translate normative guidance set out in WHO FCTC and in supporting tools such as Article 17 toolkit.

Based on the analysis above, pathways for effective supply reduction in terms of policy content include two priority areas. The first priority area is building policy content centering on alternative crops and livelihoods. Content pathways should include ‘push’ pathways of providing incentives to farmers to switch to alternative livelihoods and providing financial support for inputs and production costs for alternative crops. Additionally, policy content needs to include ‘pull’ pathways of establishing clear supply chains, value chains, and markets for farmers to be able to profit from alternative crops. These pathways need the support of additional efforts to strengthen the capacity of farmers around alternative crops or livelihoods to be successful. Joint ventures can be explored as a meaningful pathway to establish markets, build capacity and to provide financing. Medium- to long-term policy strategies should include removing tobacco-

related agricultural financial support provided by governments. Long-term policy pathways for top tobacco-growing countries include removing tobacco as a central government investment and re-directing those resources to alternative livelihoods within country development strategies.

The second priority area for supply reduction policy content is countering tobacco interference. Countries can learn from acts and laws passed in the African region in countries such as Uganda that restrict tobacco industry engagement with government and content that specifically focus on minimizing conflicts of interest. Key areas that policy content should address include banning CSR activities by tobacco companies, establishing transparent mechanisms for government employees to engage with the industry, and banning of monetary and any type of contributions to ministries, political parties, government agencies and individuals within industry. WHO FCTC and interconnected research and implementation support efforts such as the knowledge hub on the Article 5.3, Tobacco Industry Interference Index include clear guidance to develop policy content. However, as noted in the following sub-section, policy process challenges often act as barriers to codifying relevant policy guidance within national legislature.

In summary, policy content for supply reduction is scarce and only recently has been systematically pursued within the region. Current policy initiatives such as tobacco free farms are less than five years old. However, it is encouraging to see FCTC Secretariat and the WHO releasing specific support documents (e.g., Article 17 toolkit) to build policy content for supply reduction with a focus on policy processes as well. As noted in this analysis, in addition to building relevant policy content for alternative crops, policy

content countering tobacco industry influence is extremely relevant for supply reduction. Therefore, recognizing existing loopholes that enable industry interference and following best practices from other countries to counter industry interference, are also urgent.

Policy process pathways for supply reduction

Policy processes are extremely context specific. To better illustrate the policy processes related to supply reduction we use Kingdon's multiple streams framework [86]. Kingdon outlines three streams of problem, policy and politics streams which are usually envisioned as separate from each other. However, when these three converge, opportunities for adapting new policies and shifting current policies, emerge [86]. As linear policy making processes are not realistic and given the complex political involvement in tobacco production, this framework is best suited for understanding policy processes related to supply reduction.

Based on the analyses under context and content, the problem stream includes challenges posed by tobacco farming to the wellbeing of farmers and to tobacco control. These challenges are compounded by smallholder farmers being trapped in tobacco farming due to debt, disinformation by industry and governments at times on the profitability of farming, lack of markets, supply chain and policy infrastructure for alternative crops, and country economic dependence on tobacco. However, these challenges vary between countries. For example, Zimbabwe's foreign exchange earnings is heavily dependent on tobacco compared to Kenya [20,60]. Kenya's policy and labor infrastructure allowed them to be a good starting ground for tobacco free farms in partnership with WHO and WFP[81]. The political and strategic alignment

within the political stream between the Kenyan government, WHO, FAO, and WFP created a policy window to start tobacco-free farms in Migori, Kenya [83]. It has now expanded to three other regions in Kenya [83]. Additionally, the success has allowed WHO, FAO and WFP to replicate tobacco-free farms in Zambia, a country with a higher economic dependence on tobacco [83]. However, Zambia has markedly prominent levels of tobacco industry interference, influencing the politics stream [69]. Stakeholders have argued that alternative crop policy support remain poor due to industry interference and government inertia on pushing for better policies [69,87]. This barrier is illustrated by the delays Zambia faces in passing a comprehensive tobacco control act [18,87].

The examples above illustrate the importance of problem, policy, and political alignment for successful policy processes in supply reduction. Currently, there is a shift within the problem stream in top tobacco producing countries such as Zimbabwe and Malawi, who are facing significant challenges connected to environmental impact (deforestation, soil nutrient erosion) of tobacco farming [12,20,57]. Furthermore, a report by Human Rights Watch put a spotlight on unfair labor practices including child labor in Zimbabwe [88]. The lack of profitability of tobacco farming for smallholder farmers is backed by a growing body of research [57–59,61,89,90]. The growing evidence-base on multi-faceted and high-impact challenges such as rapid deforestation, lack of alternative energy for tobacco curing, poor tobacco farmer health, use of child labor, insufficient income and increase in debt can help align the problem stream with politics stream in tobacco growing countries. However, in countries such as Zimbabwe tobacco remains central to their strategic development plans, making tobacco a political priority [8]. Thus,

all top five tobacco producers (Malawi, Mozambique, Tanzania, Zambia, Zimbabwe) and countries with high tobacco industry interference (e.g., Cameroon) face challenges in aligning the politics stream with the problem stream to implement effective supply reduction policies [12,30,38,39,73].

While there is a distinct difference in enacting national level comprehensive tobacco control policies and enacting supply reduction policies in terms of time periods they occur and governance contextual factors, examples of policy processes in enacting national level tobacco control laws can provide insights into for potential supply reduction policy efforts. These insights, when adjusted to context, can inform the supply reduction policy pathways in terms of agenda setting, policy formulation and legitimation. One example is Kenya, second signatory of the WHO FCTC, used a multi-stakeholder consultative approach successfully when formulating and enacting national tobacco control law [91]. The multi-stakeholders included the Ministry of Health, the Tobacco Control Board (a consortium of government tobacco control actors), civil society and the private sector actors [91]. In Nigeria, internal conflict between ministry officials and strong industry influence delayed the process of enacting a national tobacco-control bill. The bill was only signed by President Goodluck Jonathan a few days prior to leaving office [91]. In Malawi, which only recently acceded to WHO FCTC, clear opposition to tobacco control and production reduction has delayed national tobacco control laws. Malawi's Tobacco Industries Bill of 2012, does not align with Article 17 or 18, only aiming to regulate tobacco production in the country as a strategic crop [91]. As noted earlier, Zambia is still struggling to pass a comprehensive tobacco control law as powerful industry actors and willing government actors delay the

processes [87]. Industry interference has impacted all these policy processes, either delaying or rejecting tobacco control laws [91].

Considering the policy stream, intersectoral approaches to policy processes are essential to the success of supply reduction policy pathways [92–94]. This necessity for intersectoral approaches was also echoed by experts. Experts surveyed noted that there needs to be coordination across ministries and other organizations such as relevant UN and non-governmental bodies for policy impact. Comprehensive global evidence synthesis and analysis efforts such as Disease Control Priorities, Third Edition, also stress the need for intersectoral efforts framed as “Health in all policies” especially related to risk factors such as tobacco [94]. As noted above, supply reduction requires multiple ministries within the government to coordinate. These ministries include regulatory and fiscal policy, education/awareness building, and public health guidance at minimum [92–94]. Based on normative guidance in the Toolkit for Article 17 of WHO FCTC, tobacco supply reduction specifically can benefit from integrating the following key stakeholders within the government in multi-sectoral efforts: Ministry of Health, Ministry of Agriculture and Agribusiness, Ministry of Finance and Planning, Ministry of Foreign Affairs, Ministry of Trade and Investment, Ministry of Labor, Head of State/Federal, Ministry of Urban Planning/Transport, Ministry of Education, and Ministry of Social and Family Welfare [95]. Policy processes can be operationalized via a National Coordinating Mechanism to oversee multi-sectoral strategic efforts [95]. Policy evaluations are also necessary for understanding diverse stakeholder views and integrating them into policy implementation. One expert also noted that policy impact evaluation, especially pilot project evaluation with farmer input, is crucial. Another expert

aligned with this viewpoint stating that alternative livelihood option evaluation should not only be focused on production or yield but consider research evidence related to the complete market chain of alternative crops and farmer profitability.

Successful policy processes for supply reduction require the alignment of problem, policy, and politics streams to affect policy change. As a first step in building policy pathways, problems related to tobacco growing need to be clearly identified and supported with evidence. There are overlapping problem streams supported by evidence in top tobacco growing countries in the African region as identified within the context section. These include the environmental impacts of tobacco, lack of profit for smallholder farmers, unfair labor practices including child labor, health impacts on tobacco farmers, challenges related to food security and rising use of tobacco among the general public, including youth. The second step has had a head-start due to the availability of supply reduction policy resources. These include Tool 6 of Article 17 and 2013 WHO Policy Options and Recommendations documents [95]. Tool 6 specifically provides guidance on how to re-order priorities within agricultural production for supply reduction and clear process guidance on navigating these efforts. We have synthesized the key pathway as a table and have included it as a supplementary file (Supplementary File 4).

The most challenging is the third step of aligning the politics stream with identified problems and existing policy options. Examining effective practices in the past, one approach is to garner significant media and public health actor attention related to a problem. One example is the release of *Bitter Harvest* by the Human Rights Watch on labor practices in Zimbabwe's tobacco farms, which pushed the political stakeholders

and interconnected tobacco industry stakeholders to re-examine their practices [88]. This report has resulted in a shift in policies and directives in tobacco farming by the Tobacco Industrial Marketing Board (TIMB) – the central parastatal institute of tobacco farming in Zimbabwe [96]. Another approach is to push for cost-benefit analyses within countries such as the earlier example of Kenya's assessment of GDP potential of tobacco versus the harms of tobacco farming. The resulting green light to implement tobacco-free farms initiative is an exemplary start. However, top tobacco growing nations may require further cost-benefit analyses such as projected impacts of the loss of forest cover in order to be persuaded. These analyses also need to address the masking of insufficient earnings by smallholder farmers due to focus on macro-level earning statistics alone. One approach is to integrate household-level economics of tobacco farming into these analyses. Examples from Kenya, Malawi, and Zambia already exist which may be informative for governments and other organizations [59–61,90]. A relevant next step will be to assess feasible alternatives and required policy infrastructure to initiate and sustain these alternatives. Experts indicated that governments need to establish accessible and relevant policy infrastructure to stimulate the shift towards alternative crops and support farmers with government extension workers who can guide farmers with necessary technical support. This is in addition to other policies such as establishing supply and value chains. An expert highlighted the success of ground nut production its procurement through WFP to supply for local school nutrition programs as a successful shift in policies to create a viable value chain [97]. These linkages between policy and market will be important moving forward.

Finally, the role of policy entrepreneurs (those who can influence policy processes) is a crucial catalyst for the success of policy pathways. This is especially true where tobacco industry footprint is strong such as the top tobacco growing countries. Looking at implementation of national-level comprehensive tobacco control acts, these policy entrepreneurs can be former or current ministers (e.g., Nigeria), high level political figures (e.g., Kenya) or any other individuals or groups that can mobilize the public and/ or policy makers [98,99].

In summary, while policy processes are highly context specific, there are common problem threads across major tobacco-producing countries in the region especially among those that are economically dependent on tobacco. These include environmental impact of tobacco, lack of profit for smallholder farmers, and unfair labor practices. While these problems are supported by evidence, politics associated with policy processes remain a barrier. These barriers are partly due to strong industry interference but also due to government prioritizing tobacco within their development agendas. Thus, for effective policy processes to take place at the country level, more effort is required to align this evidence informed problem stream related to tobacco farming with the politics stream.

Actors relevant to supply reduction pathways

Within our analyses of policy pathways and their context, content, and processes, we have noted important actors relevant to supply reduction. Experts interviewed, research literature and available technical guidance all highlight the importance of multi-sectoral,

multi-actor approaches to supply reduction policy [19,30,37,95]. Thus, we use this section to synthesize key actors related to supply reduction with examples.

We outline 7 key actor categories which include government (with diverse ministries and government agencies), tobacco industry (local and transnational), intergovernmental, non-governmental, academic, farmers, and the general public. Table 5 provides an overview of these actors with examples.

Table 5: Key actor categories related to tobacco supply reduction based on HPT analysis

Actor category	Actor explanation and examples
Government	All government entities are included, and they are not always aligned. Examples include Ministry of Health, Ministry of Agriculture, Ministry of Finance, President's Office etc.
Industry	TTCs (e.g., British American Tobacco), local tobacco companies (e.g., Mashonaland Tobacco Company in Zimbabwe) and Leaf Companies (e.g., Alliance One and Universal in Malawi). The goal of these companies is to oppose supply reduction and tobacco control
Intergovernmental	Intergovernmental organizations often support countries achieve development goals and provide technical guidance. Key relevant examples include WHO, UNDP, FAO, WFP, and the World Bank.
Non-governmental	Non-governmental organizations include tobacco industry fronts and tobacco control focused organizations. Examples of pro tobacco control organizations include African Tobacco Control Alliance (regional) and Cancer Association of Zimbabwe (national). Examples of industry fronts include International Tobacco Growers Association (global) and Zambia Chamber of Commerce and Industry (national). Also, health based professional organizations like medical associations (association of medical professionals) and NCD alliances (local and international).
Academic	Academic researchers tend to focus on tobacco control research. However, tobacco industry-funded research bodies have been known to publish research supporting the industry narratives.
Farmers	Farmers are a separate category given their importance to supply reduction. Farmers can also form farmer unions to represent themselves. There is also tobacco industry backed farmer unions and farmer cooperatives.
General Public	The general public includes the general population including farmers and their families.

One of the key challenges noted within this analysis is the power asymmetry and misalignment of interests among actors which has been echoed by the experts consulted in this study [19,38,71,95]. This misalignment of interest and power asymmetry is not a simple dichotomy such as tobacco industry versus government. As

indicated under context sub-section, there are power and interest asymmetries within governments (e.g., between ministries). This complexity allows some government bodies to oppose tobacco promotion and production (e.g., Ministry of Health) while other government bodies support tobacco (Ministry of Agriculture, Ministry of Finance). However, there are also clear power hierarchies such as smallholder farmers having vastly lower power than tobacco companies or government ministries. Additionally, the role policy entrepreneurs who push forward key policies cannot be undermined. For example, in Nigeria Professor Babatunde Ostomies, former Minister of Health, and Senator Jibrin Aminu spoke publicly in support of the national tobacco control bill helping it become an act within the country [91].

In summary, the composition, alignment, and power hierarchies within and between actors define policy processes and outcomes. These actors include both national level and international level stakeholders. Analyzing complex relationships inherent in the varying degrees of power and interests in supply reduction or tobacco control helps clarify understanding about the feasibility of policy pathways. Power asymmetries can be addressed via building actor coalitions and leaning on international partners. This is especially relevant when space for national level actors supporting tobacco control is restricted due to the prevailing context favoring the tobacco industry.

Table 6 summarizes the policy pathways outlined in each of the process, content, context components of the HPT and highlights key actor categories outlined above.

Table 6: Summary of key policy pathways by each Health Policy Triangle Component

Health Policy Triangle Component	Key Policy Pathways Summary

Context	• Strengthening efforts to alter perceptions that tobacco-growing countries in the African region have low rates of tobacco use.
	  ○ Strengthening advocacy highlighting the rising public health crisis of increased tobacco use in tobacco-growing countries and the region.
	  ○ Suggested methods include continued publicizing of research findings on tobacco use prevalence via inter-ministry communication, mainstream media and social media.
	  ○ Inform policy circles with regular policy briefs on the political economy of tobacco in tobacco-growing countries.
	  ○ Policy advocacy led by regional bodies with visibility such as Africa CDC
	• Focus on examining the wellbeing of smallholder tobacco farmers. Farmer wellbeing should be approached with a holistic perspective and not limit to bio-medical health challenges such as green tobacco sickness.
	  ○ Address poverty and food insecurity as key relevant social determinants of health.
	  ○ Integrate farmers and communities more when examining pathways for supply reduction and their impact on farmers
	• Build stronger alignment between advocacy organizations in the African region, government actors (e.g., health, agriculture, finance), academia and intergovernmental organizations.

Content	• Prioritize policy content centering on alternative crops and livelihoods.
	  ○ Include 'push' pathways of providing incentives to farmers to switch to alternative livelihoods and financial support for inputs and production costs for alternative crops.
	  ○ Include 'pull' pathways of establishing clear supply chains, value chains, and markets for farmers to be able to profit from alternative crops.
	• Continue prioritize policy on countering tobacco interference. Countries can learn from acts and laws passed by other countries in the region (e.g., Uganda).
	  ○ Key policy focus areas include banning CSR activities by tobacco companies, establishing transparent mechanisms for government employees to engage with the industry, and banning of monetary and any type of contributions to ministries, political parties, government agencies and individuals within industry.
	  ○ Normative guidance already exists within resources of WHO FCTC Article 5.3 related outputs. Also, within organizations such as Africa Tobacco Control Alliance and their work on African Tobacco Interference Index.

Process	• Identify challenges and harms (problem stream) related to tobacco growing and strengthen evidence bases. ○ Problem stream content include environmental impacts of tobacco, lack of profit for smallholder farmers, unfair labor practices including child labor, health impacts on tobacco farmers, challenges related to food security and rising use of tobacco among the general public, including rising use among youth. • Align policy approaches (policy stream) to address the 'problem stream' above.

	○ Use existing resources such as Tool 6 of Article 17 and 2013 WHO Policy Options and Recommendations documents • Strategize based on context to align the political stakeholders/decision makers (politics stream) with identified problems and existing policy options. ○ Options for this include, garnering significant media and public health actor attention related to a problem, push for cost-benefit analyses within countries by juxtaposing economic costs of tobacco farming versus earnings. Economic costs can include health, environment, workforce degradation related costs and more. ○ Also, prepare recommended policy infrastructure including pathways to incentivize alternative crops based on country context ○ Use policy entrepreneurs to raise the profile of the problem and policy streams and the necessity for political will. Provide media and other platforms to amplify policy entrepreneur voices
Actors	• Always factor in power asymmetries when understanding stakeholders and engaging with stakeholder groups. Empower those who have less power to share their views (e.g., smallholder farmers) and not to be exploited by industry. • Key actor groups for supply reduction (Table 5) include government, industry, intergovernmental, non-governmental, academics, farmers, and the general public. • Key actor groups are not monoliths and clear assessment of actor group interests is vital for the success supply reduction policy.

Limitations:

This study had a stronger focus on the top five tobacco growing countries in the African region. While this was intentional due to the economic dependency of these countries on tobacco, it can also be considered a limitation as each tobacco growing country has unique contextual factors affecting policy. Furthermore, while we received input from a wide range of stakeholders focused on supply reduction there is always space to include more expert views on implementation. Future research can consider building on this research with more global, regional, and national level expert input to chart potential action pathways for supply reduction in the region.

Conclusion:

In examining all components of the policy triangle, the main pathways for supply reduction in agriculturally based economies, such as the top five tobacco-growing

countries in the African region, lie within strengthening opportunity, resources, and capacity to transition towards alternative crops. The strengthening of financial and other infrastructure for alternative crops, establishing profitable markets, and removing government financial backing for tobacco farming including subsidies (Tanzania) and funds for tobacco input (Zimbabwe) are key steps for this transition. The rationale for the necessity of these policy pathways to deprioritize tobacco and shift to alternative livelihoods already has a strong evidence base. Research evidence supporting the rationale for moving away from tobacco farming includes the health and wellbeing of tobacco farmers, increasing tobacco use in tobacco-growing countries, challenges of food insecurity, unfair labor practices that impact children, environmental impact contributing to climate crisis, and so on. Policy content also has key exemplars and a rich technical guidance resource base to draw from (e.g., WHO FCTC guidance).

However, policy processes are heavily dependent on leveraging existing evidence, building key policy content relevant to the country, and most importantly aligning it with political processes which also require countering industry interference. Pathways for successful processes are dependent on actor synergy within tobacco control and governance spaces – especially synergy among in-country actors (e.g., civil society, ministry of health, ministry of finance), academic researchers and intergovernmental organizations. Intersectoral policy processes are necessary based on evidence and policy exemplars in tobacco control. In top tobacco growing countries, an important consideration is to shift the public imagination towards alternative crops as a viable income stream and highlight the serious continued harms of tobacco. To this end, using macro and micro-level cost-benefit analyses including future trajectories of current

policies remain essential. I. Policy entrepreneurs, as evidenced within demand reduction processes, can play a key role in shifting the public imagination and building political capital for supply reduction policies. Political capital remains the key ingredient necessary for lasting policy change supporting supply reduction.

For supply reduction to succeed, continued and compelling research (in tobacco farming economics, impact of tobacco, on farmer wellbeing is necessary especially to shift political support away from tobacco and to build public pressure on governments. Given the growing set of economic and health challenges for farmers engaged in tobacco farming, and sustainability-related challenges due to deforestation, periodic policy analysis research of existing development strategies in top tobacco growing countries can be a useful next step. This research can focus on comparing stated government goals, perceived expectations by stakeholders (e.g., farmers, the public), realized expectations by stakeholders and existing alternative pathways. Further research can also focus on analyzing policy process determinants such as pathways of industry influence in the national political processes, the roles of government stakeholders in promoting tobacco farming, and direct and indirect government influences on impeding tobacco control. Given that shifting public imagination is also a necessary component for supply reduction policy pathways to succeed, analysis of national media portrayal of tobacco and the tobacco industry will also prove useful as future research options.

Supply reduction pathways in top tobacco-growing countries cannot be immediately enacted or implemented. However, as illustrated in this analysis, highlighting growing challenges related to tobacco farming, supporting the use of existing normative tools

and strengthening targeted advocacy to encourage multi-sectoral policy approaches, will expedite national-level policy pathways for supply reduction. These approaches will help achieve the end goal of improving small holder farmer wellbeing and reducing risk factors related to tobacco among the general public.

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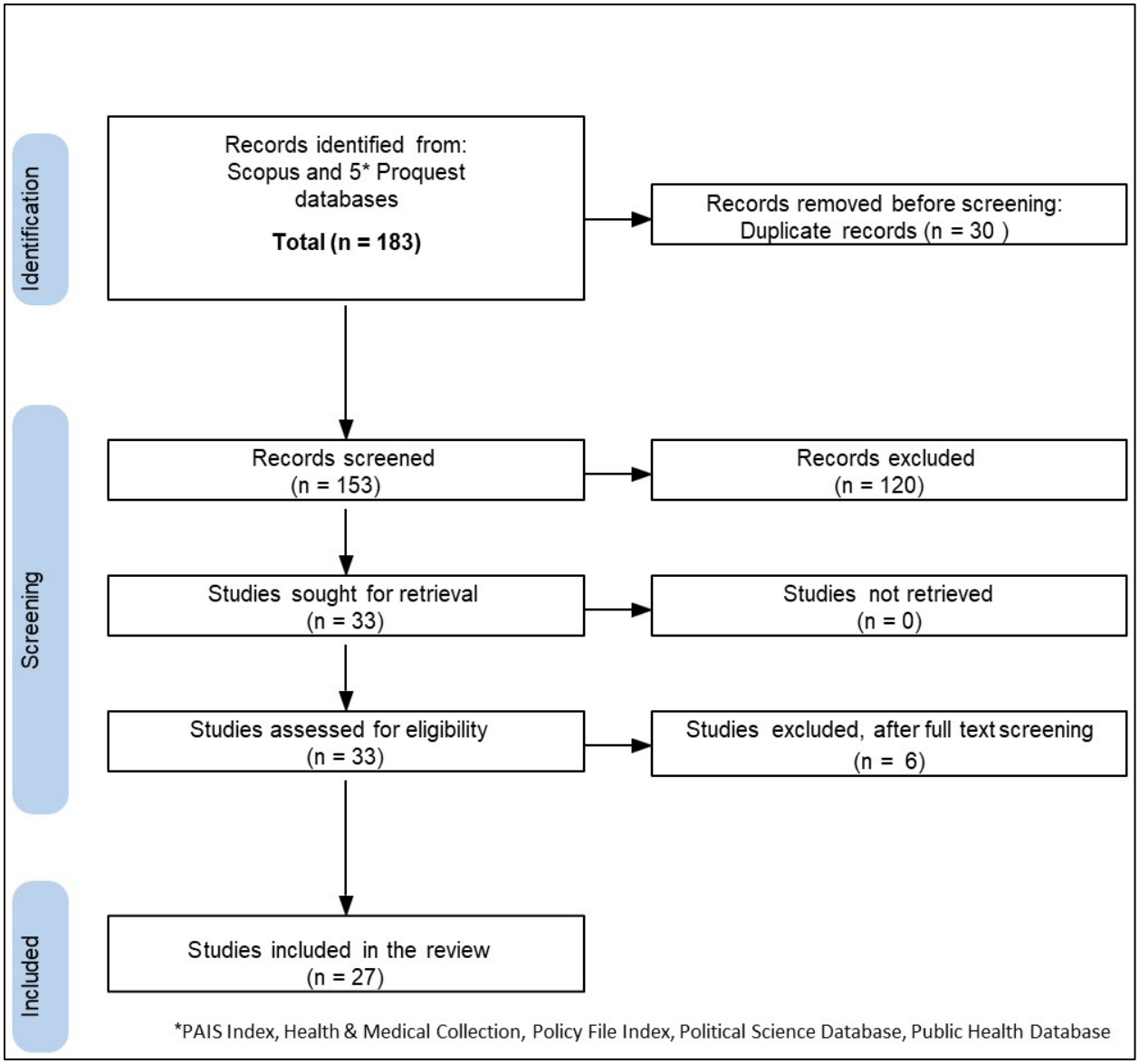
Supplementary File 1: Publication Selection PRISMA Flow Chart and search string

Figure 1: Publication Selection PRISMA flow chart



Search String for Scopus: (TITLE-ABS-KEY ((farming OR supply OR growing OR production OR agriculture)) AND TITLE-ABS-KEY (tobacco) AND TITLE-ABS-KEY (policy) AND TITLE-ABS-KEY (africa*))

ProQuest databases (PAIS Index, Health & Medical Collection, Policy File Index, Political Science Database, Public Health Database) search string: noft(Tobacco) AND noft(Farming OR supply OR Growing OR Production OR Agriculture) AND noft(Africa*) AND noft(Policy) AND PEER(yes)

Supplementary File 2: Short survey template for expert input

Expert input: Policy pathways for supply reduction in tobacco in the WHO African region

Questionnaire for 10 questions

* Required

1. Name *

2. Affiliation

3. Would you like to remain anonymous or would you be okay for us to use your name as an expert in our academic publication?
(We will send a draft of the paper prior to publication for review and approval) *

- ◯ Prefer to remain anonymous
- ◯ I am okay to mention my name in relation to my comments

4. How long have you worked in the field of tobacco control? *

- ◯ 0 to 5 years
- ◯ 5 to 10 years
- ◯ More than 10 years

5. From global examples what are the best practices that stand out to you in improving supply reduction (tobacco farming/production)? *

6. What are the biggest challenges (you can name at least top five in your opinion) for reducing tobacco farming/production in the WHO African region? *

7. For countries with high level tobacco production and economic reliance what support can regional and international stakeholders provide for supply reduction efforts? *

8. In the region, for countries that have strong economic reliance on tobacco farming, what are the best policy options that they can follow to improve supply reduction of tobacco - based on efforts from other countries with similar contextual factors? *

9. Any other comments on the implementation of the Framework Convention of Tobacco Control related to supply reduction (Article 17)? *

Supplementary File 3: List of experts who consented to being named and their affiliations

Table 1: Tobacco Control Experts who consented to being identified

Name	**Affiliation**
Marty Otañez	Anthropology Department, University of Colorado Denver
Peter Magati	Tobacco Control Researcher, Nairobi, Kenya
Donald Makoka	Lilongwe University of Agriculture and Natural Resources, Malawi
Simone St Claire	World Health Organization
Gumilang Aryo Sahadewo	Faculty of Economics and Business, Universitas Gadjah Mada, Indonesia
Marcelo Moreno dos Reis	Oswaldo Cruz Foundation

The other experts who preferred to remain anonymous included country level experts from the African region, Intergovernmental organizational experts focused on tobacco supply reduction, researchers conducting tobacco control research.

Supplementary File 4: Steps and action points for reorienting agricultural support for alternative crops based on Article 17 Toolkit for WHO FCTC

Table 1: Steps and action points for reorienting agricultural support for alternative crops

Steps for reorienting agricultural support for alternative crops	**Action points**
Estimate the support already provided	a) Interview relevant actors (e.g., relevant ministries and departments) to identify support provided b) Review existing data on support (funding/policy) c) Use simulation models to estimate data that may not be available
Identify and estimate the impact of the support provided	a) Identify relevant indicators across the three dimensions of sustainable development (social, economic, and environmental) b) Interview relevant actors (e.g., smallholders, women) to identify the outcomes of current support c) Review historical data d) Use simulation models to estimate outcomes for which there are data gaps
Design the approach for repurposing agricultural producer support	a) Identify development goals for food systems across the three dimensions of sustainable development b) Select relevant indicators for measuring performance of the repurposing strategy c) Identify measurable targets d) Identify viable policy instruments

	e) Formulate an initial strategy
Estimate the future impact of the repurposing strategy	a) Share the repurposing strategy with all relevant actors b) Use simulation models (one or more) to generate future scenarios c) Estimate impacts of the repurposing strategy across sectors and actors d) Identify the emergence of possible trade-offs or incoherence across selected provisions
Review and refine the repurposing strategy prior to implementation	a) Consult with government (e.g., regarding budget requirements) b) Consult with external groups (e.g. smallholders, women, large producers) c) Consider political economy dynamics and acceptability of the strategy d) Refine the repurposing strategy e) Identify roles and responsibilities for implementation
Monitor the outcomes of the new agricultural producer support	a) Review relevant social, economic, and environmental statistics on a regular basis b) Consult regularly with all key actors to monitor the potential emergence of side effects, and to assess if the repurposing strategy is addressing the problems it sets out to solve

Chapter 8: Discussion

In the discussion below, I delineate three key foundational learnings emerging from the three papers that comprise this thesis. I then examine the global and regional applicability of the findings, especially for supply reduction in LMICs. Building on research findings, next I discuss the necessity to raise the profile of supply reduction in the public imagination and within policy agendas, especially at the country level. Furthermore, I discuss the methodological insights gained through this research and how this thesis contributes conceptually to policy research. Next, building on all of the above, I outline what types of research could help strengthen the implementation of the WHO FCTC, with a specific focus on supply reduction (Article 17). Finally, I end the discussion with key strengths and limitations relevant to my doctoral thesis.

Key learnings and their global applicability

The first learning derived from thesis findings is the importance of building and using the knowledge on contextual factors relevant to WHO FCTC implementation, for policy formulation, legitimation, implementation, and evaluation. Our findings support previous research findings that highlight the importance of considering context in tobacco policy research (1). A thorough understanding of context can help policy advocates assess factors that shape tobacco-related policy including societal and policy maker attitudes, prevailing institutional conditions, tobacco industry influence, influence of the WHO FCTC and intergovernmental organizations such as the WHO. This understanding can in turn strengthen national level efforts to effectively implement the WHO FCTC. A pragmatic insight from the findings of the first paper, a scoping review exploring

Contextual factors impacting WHO FCTC implementation in Africa, is the categorization of contextual factors within a framework such as Leichter's (situational, structural, cultural, exogenous) facilitates a comprehensive understanding of the impact of each type of contextual factor. A framework-based approach enables a clearer understanding of how each contextual factor category affects policy processes and how contextual factors influence each other. It follows that having contextual factors disaggregated by category, based on a comprehensive framework, can be more effective for policy research and advocacy. Below I briefly illustrate how each contextual factor affects policy based on results from the scoping review.

Our finding that structural contextual factors have been most frequently highlighted or referenced in research on WHO FCTC implementation, helps direct our focus to targeted research on the governance and institutional aspects of WHO FCTC policy implementation. For example, clear understanding of structural contextual factors such as power differentials within government ministries, ability or inability to effectively coordinate across sectors, political alignment within stakeholders and willingness to enact policies, and funding capacity to effectively implement enacted policies are essential for policy formulation and implementation in any country (2–8).

Relatedly, understanding exogenous factors and how country governments engage with exogenous influences such as the WHO FCTC or China as an investor looking to strengthen tobacco farming, is necessary to keep abreast of a shifting external landscape (9–11). For example, ratifying the WHO FCTC (an exogenous factor) puts an onus on government to improve tobacco control efforts in a country (10,12). Additionally, the tobacco industry can influence government policies as exogenous

actors (13).This landscape also includes foreign government exogenous policy brokers such as the Chinese government who helped establish the China National Tobacco Company in Zimbabwe, and Japan Tobacco International, owned by the Government of Japan, who considers Ethiopia to be an “important expansion of our geographic footprint in emerging markets,” (9,14).

Additionally, understanding how previous tobacco control policy campaigns engaged with and used situational contextual factors is essential for future of supply reduction and tobacco control in general. For example, Nigeria’s rising disease burden due to tobacco motivated government to file lawsuits against British American Tobacco, Nigeria (BATN) (15,16). This highlights the importance of building a knowledge base on situational contextual factors oriented towards supporting tobacco control policy processes – especially, for policy legitimation and implementation. These situational factors can include the impact of tobacco use on disease prevalence, the uptick of tobacco use prevalence among youth, and the impact of deforestation due to tobacco farming (17–21). Situational factors can be operationalized to build public consensus on the necessity for tobacco control (e.g., by highlighting high disease burden related to tobacco) and push policy makers to act on policies in the pipeline or enact new policies.

Attention to cultural contextual factors is instrumental in building public support towards tobacco control, and to policy legitimation and implementation (22). For example, the framing of tobacco as part of Zimbabwe’s historical legacy and its legitimization as ‘our industry’, has affected policy processes within Zimbabwe, creating a favorable environment for pro-tobacco policies (23). Furthermore, studying how contextual factors have been applied, and how past policy campaigns have used them can also help

identify policy entrepreneurs to champion policy ideas and build support among different interest groups. In Kenya, the first lady took the role of a policy entrepreneur in advocating for tobacco control policy and contributed towards enactment and implementation (2,4).

A second learning from this thesis is the need to build clear, in-depth understanding of the political economy of tobacco in countries, centered on in-country multi-stakeholder perspectives from diverse sectors. Learning about the political and economic context and how they influence policy processes, key stakeholder opinions and shifts in public opinion, are essential for sustainable policy change. Including diverse stakeholder perspectives is instrumental to understanding facilitators and barriers for policy, and prevailing norms in policy processes. Scholars have argued for the importance of clearly understanding political economy for effective tobacco control (24–26). They note that an understanding of the political economy of tobacco is necessary to counter tobacco industry tactics and strengthen capacity within tobacco control institutes (10,24,26,27). Our research builds on that argument to illustrate effective ways of reaching that goal using both existing literature, statistical data, and stakeholder perspectives. For example, in the second paper *The Political Economy of Tobacco of Zimbabwe: An Analysis of Stakeholder Perspectives,* our interviews with diverse stakeholder groups helped us understand the negative impacts of tobacco that are acknowledged across stakeholder groups (e.g., deforestation due to tobacco farming), and to surface conflicting views and the amplification of industry narratives by some stakeholders (e.g., prevalence of tobacco use). Study findings indicated overall stakeholder consensus on government prioritizing tobacco as a foreign income earner, farmer health being

negatively impacted, tobacco production leading to rapid deforestation, and remote likelihood that Zimbabwe will move away from tobacco in the immediate future. Curtailing tobacco use was considered the main focus of tobacco control by stakeholders, and despite statistics illustrating a greater prevalence of tobacco use than assumed, many did not consider it to be a concern. While tobacco farmer earning challenges were noted, many continued to consider tobacco farming as the way forward for these farmers and the country, citing lack of alternatives.

A recognition of the differing viewpoints surrounding the industry helped us understand the tensions and alignments between key stakeholder groups in Zimbabwe and whether stakeholder opinions align with available statistical evidence. This can help countries assess possible pathways forward and areas of focus to target in advocacy. Thus, a continued updating of political economy research findings can especially be useful in countries that are dependent on tobacco as an economic commodity and those experiencing rapid growth in tobacco production.

A third foundational learning of this thesis is the increasing potential for policy change focused on supply reduction by aligning the growing evidence base on harms caused by tobacco (both farming and use), with existing normative policy guidance. Precedents of this approach to tobacco control are found in examples such as policy enactment for demand reduction in Beijing, China (28). In Beijing, in response to a rise in the incidence of lung cancer, tobacco control policy developed by Professor Songnian Ying, a deputy at Beijing Municipal People's Congress, helped align evidence of the problem and potential policies (28). The pro-tobacco control approach by governing bodies of Beijing and key stakeholder groups (civil society, media) indicated alignment

of political capacity and willingness. The 2013 directives for implementation including the prioritization of smoking bans in public spaces by the General Office of the Central Committee of the Chinese Communist Party and the General Office of the State Council, signaled stronger and higher-level political alignment for tobacco control. This alignment, and the policy window offered by the national government's increased efforts around tobacco control in 2013, ultimately led to policy changes in Beijing (28).

As we have illustrated in the third paper, *Policy Pathways for Supply Reduction in the African Region,* there is a growing evidence base on challenges associated with the tobacco industry such as environmental damage including rapid deforestation, impacts on smallholder farmer health and wellbeing, and lack of regulation affecting tobacco use among youth in the African region (16,17,18,24–26). Additionally, many of the top tobacco growing countries in the African region also face serious food security challenges (32). In this backdrop using resources such as the normative guidance for policy enactment in 2023 WHO FCTC Toolkit for Article 17 and 2013 WHO Policy Options and Recommendations, country stakeholders can push for better policies on supply reduction (33,34).

A potential concern related to operationalizing the third foundational learning is that policy processes and political willingness to enact policy change, are distinct in each country context and political economy. For example, while Kenya and Zambia both implemented tobacco free farms, an initiative aimed at supply reduction, the policy infrastructure in the two countries and in turn the political economy differ significantly (4,5,35,36). On one hand, Kenya already has a comprehensive tobacco control policy since 2007 and is relatively less dependent on tobacco as an economic commodity

(4,37). Zambia, on the other hand, depends more on tobacco as an economic commodity and attempts to pass a comprehensive tobacco control policy in Zambia has failed thus far (4,5,37,38). While, understanding country-specific political economic conditions is essential for effective WHO FCTC implementation, recognizing common policy pathways across countries based on common harms, institutional behavior and tactics employed by tobacco industry can also be beneficial (1). This benefit is apparent on two fronts. First, is the ability to collectively raise the profile of the common harms of tobacco farming (e.g., harms on tobacco farmer health wellbeing or environmental damage). Using the evidence base to bring attention to common harms of tobacco farming, highlighting the scale of these harms and the common challenges they pose across countries, can raise alarm about negative impact of tobacco farming and the need for policy action. Increased recognition of the problems related to tobacco farming brings it to the forefront of public and policy discussions. Second, by recognizing shared challenges, countries can learn from policy efforts in countries with similar political economic conditions. These policy precedents can be used to push governments to implement similar policy changes and to counter industry interference. Thus, supply reduction policies successfully enacted in one country can be used by advocates in another similar setting, highlighting the shared challenges between countries and potential benefits of enacting similar policies. These approaches are not novel in global health and have been used successfully to address challenges such as vaccine coverage by Gavi, the Vaccine Alliance and in demand reduction efforts to unify against industry interference in the case of Uruguay (39,40).

While this thesis focused on the African region, these key findings are applicable across regions, and globally. These findings are especially relevant for supply reduction in other LMICs due to similar contextual factors in relation to government support for tobacco and industry behavior (17,20,21,30,41,42). One example is Indonesia, a top tobacco producing country where the tobacco industry enjoys cultural capital and government support (43–45). Reiterating the value of framework based contextual analysis, by using existing literature base on Indonesia's efforts on tobacco control and providing a clear in depth understanding of the situational, structural, cultural, and exogenous contextual factors influencing tobacco supply and demand, the country's tobacco control efforts can be strengthened. Additionally, in-depth, periodically updated, research on the political economy of tobacco in Indonesia can sharpen strategies countering tobacco industry interference, identify evolving focus areas for awareness building and indicate pathways for supply reduction policies. Furthermore, since Indonesia has not acceded to the WHO FCTC, there can be lessons learned for Indonesia from countries such as Malawi, a country heavily economically dependent on tobacco as an economic commodity, that recently acceded to the WHO FCTC in 2023 (35,46,47).

Findings of this thesis are also relevant to countries such as India that are attempting to strengthen implementation of demand reduction measures but continues to view tobacco as an important agricultural export commodity (48–50). In fact, pro-tobacco farming counterparts in India views countries such as Zimbabwe as competition that needs to be outdone in terms of tobacco exports (49). This is an alarming trend that requires urgent research attention focused on contextual factors and the interconnected

political economy. This is also an opportunity for national level tobacco control advocates, intergovernmental and other regional organizations to collectively illustrate the harms of tobacco farming, the interconnected impediments to demand reduction, including the benefits that the industry enjoy when countries prioritize tobacco as an economic commodity (21,30,50).

Thus, the findings of this thesis are applicable globally for tobacco control, providing useful guidance for policy advocates aiming to strengthen country level efforts, build inter-country efforts, and tackle supply reduction in high tobacco producing LMICs.

Making supply reduction a global policy priority

While a growing body of literature highlights the harms of tobacco farming on smallholder farmers (21,35,44,47,51–56), the contribution of tobacco farming to climate crisis and environmental degradation (19,21,57–59), and how the prioritization of tobacco farming impacts demand reduction efforts (6,21,30,31), more effort is needed to strengthen the visibility of supply reduction advocacy (1,30,31,60,61). Recent themes of WHO reports on World No Tobacco Day such as *Tobacco poisoning our planet (2022)* and *Grow food not tobacco (2023)* indicate that we are moving in the right direction (19,21). WHO has also increasingly framed tobacco as a threat to overall development goals and planetary health, in addition to tobacco consumption-related risk factors. This can be observed in World No Tobacco Day, 2024 campaign material (e.g., https://youtu.be/p6rKoxkNmng?si=a3T6IQRPRP3ALRic) where a holistic framing of the harms of tobacco (e.g., harms of low earnings for farmers, harms of consumption, harms of deforestation) has been employed (17,62).

However, as noted earlier, the commitment to supply reduction and the establishment of supply reduction measures remains weak. Thus, there is room for improvement in raising the profile of supply reduction as a global policy priority by strengthening efforts to capture the public imagination and catalyze policy processes. These efforts can include the use of social and mainstream media, investing in the reporting of human-interest stories related to harms of tobacco farming, and building grassroot level organizational support (34,63–65). Research indicates that social media has been effectively employed in demand reduction efforts (66). Making supply reduction a policy and public priority can help support farmers trapped in tobacco farming and increase the urgency of building policy infrastructure to support alternative crops. As outlined in this thesis and supported by the literature and expert input, policy infrastructure for alternative crops includes dedicated financing for inputs, provision of extension workers, focused research at the national level, incentives for farmers, creation of value chains. Additionally, raising the profile of supply reduction as a central tenet of tobacco control in country and regional agendas will also help build "policy audacity," in supply reduction efforts. This in turn can facilitate national and global level policy shifts in supply reduction. Here, we use Hefler et al.'s (2022) definition of policy audacity, the "approaches and policies which are the 'firsts' globally, or create new paradigms in specific regions or countries, and which require policy makers to move beyond what has already been implemented elsewhere" (22). Examples of policy audacity is the tobacco-free generation endgame strategy ordinance in Balanga City, Philippines in 2016, the ban on tobacco industry corporate social responsibility in Mauritius in 2008, and other efforts in Uruguay, Australia, The Netherlands that mainly focused on demand reduction

(22). While policy audacity needs to be balanced with the political and economic needs, it will be important for high tobacco producing countries (e.g., Zimbabwe, Malawi, Indonesia) to consider alternative policy pathways for economic development. The risks of policy audacity in tobacco supply reduction can be mitigated by available technical support by WHO FCTC resources and available funding support through organizations such as United Nations Development Program. However, it is essential that these policies aiming to shift agricultural economic priorities are developed by in- country stakeholders prioritizing the wellbeing of smallholder farmers.

Furthermore, raising the profile of supply reduction as a priority can also influence the direction, type and level of external aid. This can lead to restricting bi-lateral aid channeled towards supporting tobacco farming. This shift in bi-lateral development aid can help first establish informal trends of not supporting tobacco farming via bilateral aid and lead to creating stricter normative global guidance on supporting tobacco farming via aid.

Raising the profile of supply reduction requires building on WHO FCTC and the work that supports WHO FCTC implementation (e.g., knowledge hubs). This will help strengthen intersectoral approaches with the support of global stakeholders, including high income countries. While national level leaders of top tobacco producing countries have a responsibility to implement supply reduction policies, shifting the global status quo to favor tobacco supply reduction efforts will be essential. While rapid creation of global markets for alternative crops may not be a feasible short-term solution, strengthening global political-economic infrastructure to support alternative crop markets will incentivize countries to look to alternatives with less concern for risk or

economic impact. Increasing global economic support for alternative crops, including strengthening markets and value chains, can also help ministries of agriculture counter industry pressure while focusing on alternative crops (67). These efforts can also be supported at the national level by encouraging governments to not subsidize tobacco farming directly or indirectly and to support alternative livelihoods (45,68,69).

Finally, while established health and development focused imperatives raise the urgency of supply reduction to support impoverished farmers and improve health, there is also the more fundamental issue of planetary health, and the need to reduce tobacco farming to protect the environment and strengthen food supply (19,21,31,70).

Methodological contributions and reflections

Using a clear and accessible framework for context analysis

In our research on understanding contextual factors related to WHO FCTC implementation and on understanding political economy of tobacco, we noted the importance of having an established framework to examine context. As indicated above use of Leichter's context categories helped us clearly delineate how each category impact policy processes and how categories influence each other (71). Prioritizing clear delineation of context categories is beneficial for policy advocacy, policy research and for policy evaluation. Having clear categories of contextual factors and how each category connects to policy implementation, also contributes towards identifying pathways for policy influencing. Identification of pathways for policy influencing along with understanding factors that influence policy, can help advocates design better advocacy campaigns, researchers identify future research areas and government

officials in policy evaluation. In WHO FCTC related research and advocacy, understanding of policy influencing pathways based on analysis of context can strengthen our understanding of tactics used by tobacco industry in different settings to influence policy.

Additionally, having context categories can also help us identify stakeholder categories relevant to each contextual factor. Identifying key actors is essential for advocacy and policy enactment. This is because key actors play a catalytic role when pushing for policy formulation, legitimation or effective implementation of existing policies. Additionally, identifying key actors can also help further research as it helps build contextually relevant initial list of stakeholders to focus on.

While preferred framework(s) for context analysis can differ, use of a simpler and easy to understand framework can help communicate finding to a wider policy audience and the general public efficiently. Since policy efforts require consensus building, especially for policy legitimation and effective implementation, using frameworks that help provide clear in-depth analysis and communicate findings effectively is impactful.

Use of interpretive description (ID) methodology for policy research

ID methodology is well suited to understanding complex policy environments. ID was developed as a methodology within the nursing practice for qualitative research focusing on “complex experiential questions” that nursing and other applied health researchers ask (72,73). ID has already been used in many other research focus areas such as medical education, humanitarian worker experiences, tobacco farmer perspectives, caregiver experiences and more (44,74–76). Based on the work within

this thesis, we note that ID is applicable and is effective in policy and governance research, which contains multiple realities and requires evidence informed interpretation. Thus, ID can act as a strong methodological foundation for policy research and political economy research using qualitative components.

Our research using ID to understand the political economy of tobacco in Zimbabwe, a research study that directly relates to national (and global) governance level policies, illustrates the fit for purpose of ID for policy and political economy research. Based on experience of this research study, benefits of using ID for national and global policy and governance research include but are not limited to, the interpretive role researcher plays, the ability to refine and improve line of inquiry based on participant answers, and the ability to iteratively integrate data sources such as policy documents to inform our questionnaires. However, as Thorne and colleagues have warned since introducing this methodology, it is vital to avoid considering the findings presented by the researcher as the “truths” of the topic in focus (72). While allowing for interpretation and new understandings, it must be grounded in the expert knowledge the researcher may possess of what is plausible (due to experience and/or knowledge gained) (72). In our research we achieved this by meticulously using existing literature to iteratively strengthen our lines of inquiry in qualitative interviews and also using data from grey and academic literature to interrogate the narratives we heard.

Furthermore, the interpretive flexibility, rigor and iterative evidence informed strengthening of lines of inquiry facilitates generating academic knowledge outputs that can easily be translated into advocacy outputs such as policy briefs. Academic research outputs that situate stakeholder perspectives and interpret them based on existing

literature and (policy) evidence, can pre-emptively address uptake barriers such as diverse policy maker ideologies and relevance to context (77).

Thus, an important reflection within this thesis is the fit for purpose of ID methodology for policy research, especially to understand complex policy environments with competing stakeholder interests, in an evolving political and economic environment. This illustration and reflection also provides an opportunity to consider the development of an adaptation guide of this methodology specifically for policy and governance research.

Advancement of knowledge in Family Medicine and Primary Care

In her keynote address to the 2013 World Congress of the World Organization of Family Doctors, the Director General of the WHO, Margaret Chan highlighted the importance of prevention in family medicine and primary care (78). She underscored this importance by highlighting the rising burden of NCDs, the necessity for family medicine and primary care to prioritize prevention efforts and singled out WHO FCTC as a key global instrument set to strengthen prevention (78). Tobacco remains the one risk factor affecting all four groups of NCDs — cardiovascular disease, cancer, chronic lung disease and diabetes (79). Tobacco is also a risk factor for communicable diseases such as tuberculosis and lower respiratory infections, health burdens that affect majority of the global community (79). Given the impact of tobacco on health outcomes caused by communicable and NCDs, the necessity for family medicine to engage in prevention in a holistic, interdisciplinary manner beyond care provision has been highlighted by other family doctors even prior to WHO FCTC coming into force (80). Furthermore,

recognizing the importance of WHO FCTC to NCD prevention, a specific target (Target 3a) related to WHO FCTC implementation has been included in SDGs as well (81,82).

The findings of this thesis are directly relevant to strengthening WHO FCTC implementation, a global health treaty designed to strengthen prevention efforts of tobacco use by improving demand reduction and supply reduction of tobacco. Specifically, the findings of this thesis contribute to prevention related policy strengthening by addressing tobacco production and demand reduction. Additionally, the thesis findings also focus on understanding and improving the health and wellbeing of the public, youth and smallholder farmers. Health impacts of tobacco use and tobacco farming also has an impact on healthcare systems, increasing demand and healthcare costs (83,84). Furthermore, the findings of this thesis are directly relevant to social determinants of health including economic factors and health outcomes related to occupation. Addressing these factors in an interdisciplinary manner is crucial for family medicine and also public health (78). Thus, the findings of this thesis can be used for advancing multi-disciplinary prevention efforts including family medicine as a discipline, to improve health outcomes across populations.

Future Directions for Research

Building on the foundational learnings of this thesis, its applicability to global efforts around supply reduction the need to elevate its importance in public and policy agendas, we propose three areas of future research to strengthen supply reduction and tobacco control at large (Appendix IV, Table 1). The first key research area is strengthening the political economy of tobacco research focused on high tobacco

producing countries. This includes developing a template indicating common criterion for country-level political economy research. Such a template will facilitate understanding of shared challenges and encourage stronger country collaboration for supply reduction. Data sources for template development include in-depth interviews with diverse in-country stakeholders, government data, academic literature, non-governmental and intergovernmental data sources.

A second key area of research focuses on improving methods for national governments to raise the profile of supply reduction among the public and within policy agendas. Currently, there is normative guidance on demand reduction efforts such as use toolkits (e.g., Article 17 Toolkit) and novel media approaches, as well as recommended pathways for policy outlined by WHO FCTC (33,65,66,85,86). However, further research is needed, especially at the country level, that identifies effective pathways to build public support for supply reduction efforts, impactful media approaches to reach the public and policy makers, and best practices in supply reduction policy based on the examination of previous policy processes. This research must move beyond government and other organizational policy experts to include younger generation national/sub-national level change makers and the pathways this generation considers effective in building public opinion and shifting policy priorities. Given evidence pointing to the explicit targeting of adolescents and young adults by industry, actively involving the younger generation in awareness building and policy advocacy can be an effective approach (17). Increased involvement of younger generation stakeholders in tobacco control in supply and demand reduction can also help reduce industry influence on youth.

The third key research area concerns ‘end game’ policy options for countries to initiate and sustain moving away from tobacco farming. This resembles end game policies suggested within demand reduction efforts such as New Zealand’s efforts to bring tobacco use prevalence below 5% by 2025 (87,88). Similarly, end game policies in supply reduction can include tobacco producing countries aiming to phase out of tobacco farming entirely or bring it to a very minimal proportion of their exports. Potential supply reduction end game policy research efforts can be designed as multi-pronged and multi-stage efforts that can combine to chart a global agenda for supply reduction. These efforts can build on and strengthen efforts already launched under Article 17 and 18 of the WHO FCTC. A key consideration within this research area is recognizing and addressing challenges related to creating supply chains, value chains, and markets for alternative crops. This agenda needs to outline pathways for a comprehensive, global, time-bound supply reduction agenda and provide country specific pathways (e.g., pathways for Zimbabwe) for governments to feasibly switch from tobacco to alternative crops.

Strengths and Limitations

Two main strengths stand out within this thesis. First is the extensive input from experts from the African region (e.g., experts in Kenya, Zimbabwe, Mozambique, Zambia, Malawi) who either contributed as co-authors or experts in data collection. This strength that led to strong in country partnerships contributed to ensuring robustness in data collection for qualitative interviews (n= 23) in Zimbabwe, despite the challenging political environment where tobacco can be a sensitive topic. As a research thesis that primarily focuses on the African region with lessons for LMICs globally, input and co-production

of knowledge with experts from the African region also follows best practices of knowledge production (89). Second, the sequential approach that examined current research on context related to WHO FCTC implementation, a comprehensive analysis of the political economy of tobacco in Zimbabwe, leading to examining pathways for tobacco supply reduction has been instrumental in creating comprehensive outputs. This sequence, supported by methodologies such as ID and case study methodology which support including diverse range of data sources resulted in thorough analysis and interrogation of findings to ensure applicability and relevance.

In terms of limitations, the political realities of countries that are heavily dependent on tobacco, their relationship with researchers at times acted us limiting factors affecting preparation. While we were able to overcome some of the challenges and collect data from a diverse range of stakeholder groups, our research could have been further strengthened by access to additional industry and key government stakeholders in Zimbabwe.

Chapter 9: Conclusion

Applicability of overall research findings

Globally, governments and civil society have made notable progress in tobacco control since WHO FCTC came into effect in 2005 (29). However, concerted, context-specific research and policy implementation efforts in tobacco control are essential in order to better public health, support vulnerable farmers, and to protect the planet (19–21,29).

This thesis sought to produce evidence and evidence informed recommendations for strengthening WHO FCTC implementation in LMICs with a focus on supply reduction in the African region. These research efforts, in part, responded to the recommendations by tobacco control researchers and advocate to strengthen the understanding of contextual factors and the country level political economy related to WHO FCTC implementation (10,24,90). Research findings strengthen the calls for improving the whole of government and intersectoral approaches. Research findings also indicate that effective whole of government approaches in tobacco control need continuous analyses of the political economy of countries. This is especially relevant to countries that are highly dependent on tobacco as an economic commodity.

In terms of policy applicability, the findings of this research are directly relevant to WHO FCTC implementation and operationalizing its WHO FCTC progress report recommendations which includes strengthening supply reduction and improving WHO FCTC implementation in LMICs (90,91). Furthermore, research findings are also directly relevant to *Global Strategy to Accelerate Tobacco Control - 2019-25* (92). Specifically, our research findings contribute to strategic objective 3, “Protecting the integrity and

building on the achievements under the WHO FCTC," of the *Global Strategy to Accelerate Tobacco Control - 2019-25* (92). Withing the strategic objective 3, findings contribute to building political support for tobacco control efforts (3.2.1 strategic priority), promoting multisectoral collaborative efforts, including increased collaboration with civil society organizations (3.2.2 strategic priority) and implementing measures to protect public health policy from interference by the tobacco industry (Article 5.3) (3.2.4 strategic priority) (92).

Learnings from the doctoral research process

My motivation towards this doctoral project was rooted in my strong interest in global health policy and governance. WHO FCTC, the largest global health treaty that pushes for global and national level intersectoral collaborations is one of the best success stories of global health governance. However, I noted that WHO FCTC implementation is facing challenges due to structural challenges globally and nationally, including economic systems, power hierarchies, monetary power and so on. My goal was to learn about systematically unpacking these complexities to build potential policy pathways and to examine innovative ways to shift policy priorities to support WHO FCTC implementation. I envisioned that my findings would be relevant not only for WHO FCTC implementation efforts but to other global health treaties as well. Upon completion of this research, I note that in addition to strong relevance for WHO FCTC, many of these findings can transfer to other global health treaties, including crucial treaties that are in development such as the pandemic treaty. Thus, the systematic approach I took within this doctoral project, the operationalizing of methodologies and navigating research

processes have provided me with key foundational lessons that will continue to shape my research efforts in global health policy.

I believe that strong partnerships that Dr. Lencucha and Dr. Drope had built over time with dedication to cultivating sustainable research partnerships, using ethical principles of collaboration with their colleagues in Kenya, Malawi, Mozambique, Zambia and Zimbabwe was a foundational pillar of success for this research. The ecosystem of research partnerships and precedence set by previous efforts of using evidence generated to strengthen national level community led advocacy, contributed greatly to the design and implementation of this project. These lessons by example, set by my entire multi-country research team are lessons that I will continue to build on. I also hope our research team will continue to strengthen these collaborations, and many other researchers will learn from this collaborative model.

I also want to note a key inequity that this research process underscored, which is visa inequity. Visa inequities continue to fashion knowledge generation, dissemination, partnership building and opportunities to lead in global health. Visa inequities predominantly impact LMIC citizens, often limiting the ability of researchers to access research opportunities, showcase their research, bring national and regional challenges to the global agenda and affecting their functional capacity as researchers as well. Using my journey within this doctoral research project and building on previous discriminatory experiences I faced, I advocated for visa equity and asked for better efforts by institutions in an article titled “The weight of my passport and my place in global health,” in May 2023 (93). Furthermore, recognizing that this needs collective solution building, I led a global authorship team with similar lived experiences, for an

article outlining specific solutions stakeholders can take to resolve visa inequities. This article titled “Imagining a future in global health without visa and passport inequities” was published in August 2023 (94). As we look to all LMIC researchers impacted by this challenge, I hope that the indirect outputs of this doctoral research project on visa equity will inspire our global health community, including our own departments and universities, to push for visa equity. This collective advocacy is necessary and is strongly connected to research equity and epistemic justice.

Overall, I want this research to make a difference in policy agendas, even if it is small in scale and act as a springboard for context focused research on policy, prioritizing communities involved and affected. I also want the strengths and the limitations of this doctoral research journey to matter towards strengthening equity centered infrastructure building in global health research.

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Thesis Appendices

Appendix 1: Ethics Approval

McGill

Faculty of Medicine
3655 Promenade Sir William Osler
#633
Montreal, QC, H3G 1Y6

Faculté de médecine
3655, promenade Sir William Osler
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Friday, November 22, 2019

Dr. Raphael Lencucha
Physical and Occupational Therapy
3630 Sir William Osler – Room 300B
Montreal, Quebec H3G 1Y5

RE: IRB Review Number: A11-E80-19A (19-11-077)

The political economy of tobacco production and control in Mozambique and Zimbabwe

Dear Dr. Lencucha,

Thank you for submitting the above-referenced study for an ethics review.

As this study involves no more than minimal risk, and in accordance with Articles 2.9 and 6.12 of the 2nd Edition of the Canadian Tri-Council Policy Statement of Ethical Conduct for Research Involving Humans (TCPS 2 2018) and U.S. Title 45 CFR 46, Section 110 (b), paragraph (1), we are pleased to inform you that approval for the study and study instruments (IRB dated November 2019), Policy Informant consent form (April 28, 2015) and Farmer survey consent form (4-25-12) was provided by an expedited/delegated review on 22-Nov-2019, valid until **21-Nov-2020**. The study proposal will be presented for corroborative approval at the next meeting of the Committee.

The Faculty of Medicine Institutional Review Board (IRB) is a registered University IRB working under the published guidelines of the Tri-Council Policy Statement 2, in compliance with the Plan d'action ministériel en éthique de la recherche et en intégrité scientifique (MSSS, 1998), and the Food and Drugs Act (17 June 2001); and acts in accordance with the U.S. Code of Federal Regulations that govern research on human subjects (**FWA 00004545**). The IRB working procedures are consistent with internationally accepted principles of good clinical practice.

The Principal Investigator is required to immediately notify the Institutional Review Board Office, via amendment or progress report, of:

- Any significant changes to the research project and the reason for that change, including an indication of ethical implications (if any);
- Serious Adverse Effects experienced by participants and the action taken to address those effects;
- Any other unforeseen events or unanticipated developments that merit notification;
- The inability of the Principal Investigator to continue in her/his role, or any other change in research personnel involved in the project;
- A delay of more than 12 months in the commencement of the research project, and;
- Termination or closure of the research project.

The Principal Investigator is required to submit an annual progress report (continuing review application) on the anniversary of the date of the initial approval (or see the date of expiration).

The Faculty of Medicine IRB may conduct an audit of the research project at any time. If the research project involves multiple study sites, the Principal Investigator is required to report all IRB approvals and approved study documents to the appropriate Research Ethics Office (REO) or delegated authority for the participating study sites. Appropriate authorization from each study site must be obtained before the study recruitment and/or testing can begin at that site. Research funds linked to this research project may be withheld and/or the study data may be revoked if the Principal Investigator fails to comply with this requirement. A copy of the study site authorization should be submitted the IRB Office.

It is the Principal Investigator's responsibility to ensure that all researchers associated with this project are aware of the conditions of approval and which documents have been approved.

The McGill IRB wishes you and your colleagues every success in your research.

Sincerely,

Roberta Palmour, PhD
Chair
Institutional Review Board

cc: Associate Dean, Research Medicine
A11-E80-19A (19-11-077)

NOV. 2019

CIHR Project Grant Proposal: Lencucha et al. (2019) *Political Economy of Tobacco in Mozambique and Zimbabwe*

Introduction: Tobacco use remains the single most important cause of preventable morbidity and premature mortality worldwide. While 100 million people died from tobacco use in the 20th century, an estimated 1 billion people will die from tobacco use in the 21st century without effective policy interventions (1,2). Importantly, 80% of these deaths will occur in low- and middle-income countries (LMICs) by 2030 (3). Tobacco use, in particular, is rising rapidly in Sub-Saharan Africa (SSA) (2). Tobacco control efforts worldwide are guided largely by the policy interventions elucidated in the framework Convention on Tobacco Control (WHO FCTC), an international treaty that currently has 181 parties (www.who.int/fctc/en/). Although most of these interventions aim to reduce consumption through demand reduction measures (e.g. tobacco taxation, graphic warning labels, marketing restrictions, etc.), the treaty also identifies the importance of supply-side reduction (i.e. reducing tobacco production and availability). It seeks to do this, in part, by compelling FCTC parties to find sustainable alternative livelihoods for smallholder tobacco farmers (Article 17). Moreover, the livelihood argument for tobacco farming (i.e. that it is essential for the economic development of tobacco-growing countries and the financial security of millions of smallholder tobacco farmers) is routinely invoked by the tobacco industry and used to gain access to, and influence, policy makers in key economic ministries in many LMICs (2–4). There is little evidence on how and why farmers gain or lose from tobacco growing. However, the crude narrative of prosperity is proving successful in preventing implementation of both demand- and supply-side tobacco control measures in most tobacco producing countries (5,7,8).

This project will expand our ongoing research that investigates how the political economy of tobacco supply affects tobacco control efforts in SSA (Kenya, Zambia, and Malawi) and Indonesia, and empirically examines the economic livelihoods of smallholder farmers. Importantly we are also beginning to examine the mechanisms that perpetuate tobacco production and the policy and market levers that can create a shift to alternatives. This study extends our research to two of the largest tobacco-producing SSA countries, both of which face increasing domestic tobacco use amidst challenges to tobacco control interventions: **Zimbabwe** and **Mozambique**. Following the same two lines of inquiry as our ongoing research (described under Background and Rationale), this project will answer **three overarching questions**:

1. What are the political and economic conditions that lead to policies in support of tobacco production and inhibit policies that support alternatives to tobacco growing (supply-side)?
2. How do these policy measures affect domestic tobacco control measures (demand-side)?
3. What are the actual economic livelihoods of smallholder tobacco farmers?

We will add to an emerging evidence base, largely generated by our recent studies (Appendix A), that illustrates the complex and problematic political economy of tobacco as an economic development-poverty reduction strategy. Through knowledge translation activities proven effective in engaging tobacco farmers and policy makers, we will contribute to broad-based government and civil society efforts to address tobacco industry growth in LMICs, which in turn will contribute to mitigating harms of tobacco use.

Background and Rationale: This proposal builds directly on two NIH-supported studies -- Research and Capacity-Building at the Nexus of Tobacco Control and Economic Policymaking in Africa (2012-2017), and The Political Economy of Tobacco Farming in Low- and Middle-Income Countries (R01DA035158) (2017-2022) -- and research funded by the Bloomberg Initiative to Reduce Tobacco Use conducted in the Philippines and Brazil from 2012-2015, and the World Bank conducted in Indonesia (2015-2017) (9). These studies examine the complex dynamics at the nexus of tobacco control and economic policy and pursue two main lines of inquiry. The **first line of inquiry** explores the policy context with particular emphasis on identifying the key conflicts that exist across health and economic sectors, and how to resolve these. We examined how the public health community could use opportunities within existing international economic structures to protect public health innovation (7–9). We explored how tobacco-growing countries oppose tobacco control in key international economic fora, such as the World Trade Organization, using familiar tobacco industry arguments (5,6). We also sought to explain how government

Title of Study: The Political Economy of Tobacco Production and Control in Mozambique and Zimbabwe
IRB Protocol #
Approval Date:
Approval Period:
The Faculty of Medicine Institutional Review Board (McGill IRB)
McIntyre Medical Building, 3655 Promenade Sir William Osler, Montreal, Quebec, Canada H3G 1Y6

CONSENT TO PARTICIPATE IN A RESEARCH STUDY
FARMER SURVEY

Title of the Research Study: The Political Economy of Tobacco Production and Control in Mozambique and Zimbabwe

Sponsor(s) of the Research Study: Canadian Institute of Health Research

Principal Investigator(s) of the Research Study:

Raphael Lencucha, PhD
Associate Professor, McGill University
Faculty of Medicine, School of Physical and Occupational Therapy
Office: 300B Hosmer House, 3630 Promenade Sir William Osler
Tel: 1-514-442-5898
Email: raphael.lencucha@mcgill.ca

NOTE: We had previously applied – successfully – for permission to use oral consent because the vast majority of our participants are not literate. Furthermore, there is a strong tradition of oral communication in these cultures and we would like to remain consistent with the participants' usual communication modes.

Invitation to Participate:

We invite you to take part in this research study about the economics of tobacco farming because you have indicated that you grow or have recently grown tobacco leaf. This discussion is to help you decide if you want to take part. We expect that up to 650 across the country will be in the study. I will carefully explain all parts of this consent form. Ask us about any parts or words that are not clear to you.

Information on the Research Project:

1. The purpose of this research is to understand the political and economic conditions that lead to policies in support of tobacco production and inhibit policies that support alternatives to tobacco growing. We also aim to understand how these policy measures affect domestic tobacco control measures. In particular, we are examining the actual economic livelihoods of smallholder tobacco farmers.

IRSC CIHR McGill

McGill University
3655 Promenade Sir-William-Osler
Montreal, Quebec H3G 1Y6

Principal Investigator: *Raphael Lencucha, PhD*

The Political Economy of Tobacco Production and Control in Mozambique and Zimbabwe
Canadian Institute of Health Research (CIHR)

Introduction and Purpose of Study

This CIHR-funded project supports our ongoing research that investigates how the political economy of tobacco supply affects tobacco control efforts in SSA (Kenya, Zambia, and Malawi) and Indonesia, and empirically examines the economic livelihoods of smallholder farmers. In our project, we are working with experienced researchers who bring expertise in political economy, policy studies, all aspects of tobacco control research, including quantitative and qualitative methods.

The purpose of this research is to understand the political and economic conditions that lead to policies on tobacco production and alternatives to tobacco growing. We also aim to understand how these policy measures affect tobacco control measures.

The overarching study involves multiple parts. In the first component of the study, we are doing a policy document analysis. We will begin by collecting and analyzing recent and current research, legislation, corresponding regulations, and reports pertaining to tobacco control and tobacco farming specific to Mozambique and Zimbabwe. The second component is interviewing policy makers, mainly representatives who have been actively involved in domestic tobacco policy including tobacco control and tobacco economics, agriculture and other production-oriented sectors, and major international economic and health policies (e.g. regional trade and investment agreements, the Framework Convention on Tobacco Control) or national development strategies. We are interested in gaining diverse perspectives on the political economy of tobacco from those who have worked on these issues in the policy context. We are particularly interested in gaining perspectives from those involved in public policy across sectors of government including agriculture, trade, investment, development, agribusiness and other related sectors.

You have been invited to participate because you have been identified as having a role in the policy making on tobacco in your country

In this consent form, we are inviting you to take part in a one-on-one interview with us to share your stories and experiences of working and consulting with various stakeholders on tobacco policy.

McGill | Faculty of Medicine and Health Sciences | Faculté de médecine et des sciences de la santé

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November 9, 2021

Dr. Raphael Lencucha
300B Hosmer House,
3630 Promenade Sir William Osler
Montreal, QC, Canada, H3G 1Y5

RE: IRB Study Number A11-E80-19A (19-11-077)
The political economy of tobacco production and control in Mozambique and Zimbabwe

Dear Dr. Lencucha,

Thank you for submitting an application for Continuing Ethics Review for the above-referenced study.

The study progress report was reviewed and Full Board re-approval was provided on November 8, 2021. The ethics certification renewal is valid from **November 19, 2021 to November 18, 2022**.

The Investigator is reminded of the requirement to report all IRB approved protocol and consent form modifications to the Research Ethics Offices (REOs) for the participating hospital sites. Please contact the individual hospital REOs for instructions on how to proceed. Research funds may be withheld and / or the study's data may be revoked for failing to comply with this requirement.

Should any modification or unanticipated development occur prior to the next review, please notify the IRB promptly. Regulation does not permit the implementation of study modifications prior to IRB review and approval.

Regards,

Roberta M. Palmour, PhD
Chair
Institutional Review Board

cc: A11-E80-19A (19-11-077)

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November 15, 2022

Dr. Raphael Lencucha
School of Physical and Occupational Therapy
3630 Promenade Sir William Osler
Montreal, QC, Canada, H3G 1Y5

RE: IRB Study Number A11-E80-19A (19-11-077)
The political economy of tobacco production and control in Mozambique and Zimbabwe

Dear Dr. Lencucha,

Thank you for submitting an application for Continuing Ethics Review for the above-referenced study.

The study progress report was reviewed and Full Board re-approval was provided on November 14, 2022. The ethics certification renewal is valid from **November 18, 2022 to November 17, 2023**. The status of your renewal submission including documents can be accessed on eRAP.

Investigators are reminded of the requirement to report all McGill IRB approved study documents to the Research Ethics Offices (REOs) of participating study sites, if applicable. Please contact the individual REOs for instructions on how to proceed. Research funds may be withheld and / or the study's data may be revoked for failing to comply with this requirement.

Should any modification or unanticipated development occur prior to the next review, please notify the IRB promptly. Regulation does not permit the implementation of study modifications prior to IRB review and approval.

Regards,

Roberta M. Palmour, PhD
Chair
Institutional Review Board

cc: A11-E80-19A (19-11-077)

Appendix 2: Letter from Marondera University for Key Informant Interviews

MUAST
MARONDERA UNIVERSITY
OF AGRICULTURAL SCIENCES AND TECHNOLOGY

13 February 2023

To whom it may concern,

RE: LETTER OF INTRODUCTION MR SHASHIKA BANDARA

I write to formally introduce Mr. Shashika Bandara, a Doctor of Philosophy candidate from McGill University who is being hosted by Marondera University of Agricultural Sciences and Technology (MUAST). MUAST, through its Climate Change and Food Security Institute, is conducting a project entitled "*The political economy of tobacco in Mozambique and Zimbabwe*" in collaboration with McGill University under which Mr. Bandara is conducting his research.

Mr. Bandara's project activities will include conducting key informant interviews (KIIs) with stakeholders with experience and expertise in the field of this study. The study aims to generate empirical data on tobacco socio-economic activities and practices that shape the local context of the crop's contribution to livelihoods of farmers. It also aims to understand the political economy of tobacco in Zimbabwe from multiple perspectives. Data collected from the KIIs is solely a key activity for the project. It will also be used to inform stakeholders, farmers and policy makers on the developments around tobacco.

The study observes ethical rules and procedures approved by the collaborating institutions on this project. For further questions, do not hesitate to contact the undersigned.

Yours sincerely,

Esther N. Masvaya (Ph.D.)

Marondera University of Agricultural Sciences and Technology
CSC Campus
Plot 15, Longlands Road, Marondera
P.O. Box 35 Marondera
Dozmery Campus,
40 km along
Ruzawi Road,
Marondera

Climate Change and Food Security Institute
Director: Dr E. N. Masvaya

enmasvaya@muast.ac.zw
Cell: +263712390279

Appendix 3: Informed consent form for key informant interviews

Investigator: Professor Nhamo Nhamo, PhD
Marondera University of Agricultural Sciences and Technology,
P O Box 35 Marondera, Zimbabwe.

Principal Investigator: *Raphael Lencucha, PhD*
McGill University
3655 Promenade Sir-William-Osler
Montreal, Quebec H3G 1Y6, Canada

The Political Economy of Tobacco Production and Control in Mozambique and Zimbabwe

Introduction and Purpose of Study

This project supports our ongoing research that investigates how the political economy of tobacco supply affects tobacco control efforts in Zimbabwe and Mozambique building on our research in the African region (Kenya, Zambia, and Malawi) and in Indonesia. We aim to empirically examine the economic livelihoods of smallholder farmers. In our project, we are working with experienced researchers who bring expertise in political economy, policy studies, and all aspects of tobacco control research, including quantitative and qualitative methods. This project is funded by Canadian Institute of Health Research (CIHR).

The purpose of this research is to understand the political and economic conditions that lead to policies on tobacco production and alternatives to tobacco growing. We also aim to understand how these policy measures affect tobacco control measures.

The overarching study involves multiple parts. In the first component of the study, we are doing a policy document analysis. We will begin by collecting and analyzing recent and current research, legislation, corresponding regulations, and reports pertaining to tobacco control and tobacco farming specific to Mozambique and Zimbabwe. The second component is interviewing policy makers, researchers mainly representatives who have been actively involved in domestic tobacco policy including tobacco control and tobacco economics, agriculture and other production-oriented sectors, and major international economic and health policies (e.g. regional trade and investment agreements, the Framework Convention on Tobacco Control) or national development strategies. We are interested in gaining diverse perspectives on the political economy of tobacco from those who have worked on these issues in the policy context. We are particularly interested in gaining perspectives from those involved in public policy across sectors of government including agriculture, trade, investment, development, agribusiness and other related sectors.

You have been invited to participate because you have been identified as having a role in the policy making or informing policy making on tobacco in your country.

For academics: You have been invited to participate because you have been identified as one of the experts within the research and implementation community helping to inform policy in your country.

In this consent form, we are inviting you to take part in a one-on-one interview with us to share your stories and experiences of working and consulting with various stakeholders on tobacco policy.

Participation Procedures:

We will ask you questions about policy processes, your experience with these processes.

Potential Risks to Participation:

We do not believe that there are any risks or discomforts as part of this study since you are not required to give your name, but if you are uncomfortable about any type of information that we are asking, please simply indicate that you do not wish to answer.

Anticipated Benefits to Participants and Society:

While there is no immediate benefit to you individually from participating in this interview, we believe that understanding tobacco policy could help the government to inform better their policies around tobacco and alternative livelihoods.

Our hope is that your contribution will help us to better understand the political and economic conditions that lead to policies in support of tobacco production and alternatives to tobacco growing. Your participation in this study may ultimately contribute to improving the better tobacco policies and ultimately close the gap between policy development and its implementation in practice.

Confidentiality:

Your research records will be kept confidential. No information about you or provided by you during the research will be disclosed to others without your written permission. The Research Ethics Committee of the McGill Faculty of Medicine may access the study data to ensure the ethical conduct of the study.

Your name will not appear on the information you share with us. The study information could be printed/published in academic journals or shared with audiences at scientific meetings, but your identity will not be revealed.

A pseudonym will be assigned to your name, which will be used to identify the information you provide. The document linking the pseudonym to your name will not leave the McGill Faculty of Medicine and will be accessible only to the principal investigators of the study and the research assistants, who understand their obligation to maintaining confidentiality. The McGill Research Ethics Committee may access this study data to ensure the ethical conduct of the study. The electronic transcripts will be deidentified and anonymized and stored on an encrypted and password protected folder on a password protected computer.

The identifiable data will be stored in a locked file-cabinet at the office of the Principle Investigator at McGill University. Only de-identified data from the study will be stored in locked file cabinets at McGill University, School of Physical and Occupational Therapy, 3630 Promenade Sir William Osler (Drummond), room 300B, Montreal QC H3G 1Y5.

Voluntary Nature of the Study:

Your participation is **completely voluntary.** If you agree to participate in the study and then change your mind **you may withdraw at any time** with no penalty or consequence to you. By agreeing to partake in this study, you do not forgo any of your rights, nor do you free the researchers of their legal and ethical responsibilities.

Summary:

You have the right to ask questions at any time. We encourage you to read over this consent and ask any questions you might have before agreeing to participate. Your participation is voluntary, and you may withdraw your consent at any time.

You may contact the Ilde Lepore, Ethics Officer, (514) 398-8302 of the McGill Faculty of Medicine Institutional Review Board, McGill University, Faculty of Medicine, McIntyre Medical Building, #633 - 3655 Promenade Sir William Osler; Montreal, Quebec, H3G 1Y6 for any questions regarding your rights as a research participant.

If you have any questions about the research study you may contact Dr. Raphael Lencucha at (514) 398-4400 x 09670 (McGill) or (514) 442-5898. Please leave a message on voice-mail if researcher is not there and your call will be returned.

Statement of Consent

Your signature below indicates:

I have had a chance to ask questions and have had these questions answered to my satisfaction;

I do not waive my any of my legal rights by signing the consent form;

I consent to participate in this research study; and

I will be given a copy of the signed permission form.

_____

Name of Participant

_____ _____

Signature of Participant Date

Signature of Researcher

I have personally explained the research to the participant and answered all of questions. I believe that he/she freely gives consent to participate.

_____

Name of Investigator

_____ _____

Signature of Investigator Date

Routing of signed copies of the consent form:

Give to participant.

Place in the Principal Investigator's research file.

Appendix 4: Future research directions

Table 1: Future research directions based on the completed thesis

Future Research Priority Area	Key considerations
Strengthening political economy of tobacco research at the country level for high tobacco producing countries	Actions can include developing a template indicating common criterion for country-level political economy research. Such a template will facilitate understanding of shared challenges and encourage stronger country collaboration for supply reduction. Data sources for template development include in-depth interviews with diverse in-country stakeholders, government data, academic literature, non-governmental and intergovernmental data sources
Improving methods for national governments to raise the profile of supply reduction among the public and within policy agendas	Identify effective pathways to build public support for supply reduction efforts, impactful media approaches to reach the public and policy makers, and best practices in supply reduction policy based on the examination of previous policy processes. This research must include younger generation national/sub-national level change makers and the pathways this generation considers effective in building public opinion and shifting policy priorities Use existing normative guidance on supply reduction as a starting point. These include implementation toolkits (e.g., Article 17 Toolkit) and recommended pathways for policy outlined by WHO FCTC
Researching 'end game' policy options for countries to initiate and sustain moving away from tobacco farming (e.g., In demand reduction New Zealand's aims to bring tobacco use prevalence below 5% by 2025)	End game policies in supply reduction can include tobacco producing countries aiming to phase out of tobacco farming entirely or bring it to a very minimal proportion of their exports. These efforts can build on and strengthen efforts already launched under Article 17 and 18 of the WHO FCTC. Key considerations within this research area is recognizing and addressing challenges related to creating supply chains, value chains, and markets for alternative crops. This agenda also needs to outline pathways for a comprehensive, global, time-bound supply reduction agenda and provide country specific pathways (e.g., pathways for Zimbabwe) for governments to feasibly switch from tobacco to alternative crops.