INFLUENCE OF MEDIA COLLABORATION WITH STAKEHOLDERS IN THE PREVENTION OF ILLEGAL GOLD MINING IN ZAMFARA, NIGERIA

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INFLUENCE OF MEDIA COLLABORATION WITH STAKEHOLDERS IN THE PREVENTION OF ILLEGAL GOLD MINING IN ZAMFARA, NIGERIA

by

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LIST OF SYMBOLS

BCa	Bias-corrected and accelerated
β	Beta
R^2	Coefficient of determination
α	Cronbach's alphas
f^2	Effect size
q^2	Effect size Cohen
E1	English language 1
E2	English language 2
H1	Hausa language 1
H2	Hausa language 2
Pb	Lead
LB	Lower bound
Hg	Mercury
Q^2	Predictive relevance
***p*-value**	Probability statistics
r_s	Spearman's rank (rho) in correlation
***t*-value,**	Test statistics
UB	Upper bound

LIST OF ABBREVIATIONS

AIDS	Acquired Immunodeficiency Syndrome
ASGM	Artisanal and Small-Scale Gold Mining
ASGMs	Artisanal and Small-Scale Gold Miners
ASM	Artisanal and Small-Scale Mining
AVE	Average Variance Extracted
CAC	Corporate Affairs Commission
CCA	Confirmatory Composite Analysis
CFA	Confirmatory Factor Analysis CFA
CJM	Collaborative Journalism Model
CMRE	Committee on Mineral Resources and the Environment
CR	Composite Reliability
CVI	Content Validity Index
DRC	Democratic Republic of the Congo
EAG	Environmental Action Group
EFA	Exploratory Factor Analysis
ENGOs	Environmental Non-Governmental Organisations
FGN	Federal Government of Nigeria
GDP	Gross Domestic Product
HIV	Human Immunodeficiency Viruses
HND	Higher National Diploma
HTMT	Heterotrait-monotrait Ratio of Correlations
IA	Integrated Assessment
IBM	International Business Machines Corporation
IGM	Illegal Gold Mining
IGMs	Illegal gold miners
IIED	International Institute for Environment and Development
IRT	Item Response Theory
LGAs	Local Government Areas
LSM	Large Scale Mining
MCPM	Media Collaboration and Prevention Model
MMRD	Multilevel Mixed Methods Research Design

MMSD	Ministry of Mines and Steel Development
MSF	Médecins Sans Frontières
NCE	National Certificate in Education
NEITI	Nigeria Extractive Industries Transparency Initiative
NGOs	Non-Governmental Organisations
NMC	Nigerian Mining Corporation
PLS	Partial Least Square
QUAL	Qualitative
QUAN	Quantitative
SCSM	Senate Committee on Solid Minerals
SEM	Structural Equation Model
SMREMC	State Mineral Resources and Environmental Management Committee
SPSS	Statistical Package for Social Sciences
SSM	Small-Scale Mining
UNCED	United Nations Conference on Environment and Development
US EPA	US Environmental Protection Agency
VIF	Variance Inflation Factor
ZMoE	Zamfara Ministry of Environment and Solid Minerals
ZRTS	Zamfara Radio and Television Services
ZGBSCU	Zamfara Gold Buyers and Sellers Cooperative Union

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PENGARUH KOLABORASI ANTARA MEDIA DAN PEMEGANG TARUH DALAM MENCEGAH PERLOMBONGAN EMAS HARAM DI ZAMFARA, NIGERIA

ABSTRAK

Kajian ini bertujuan untuk mengkaji faktor-faktor perlombongan emas haram (IGM) di Zamfara, Nigeria dan peranan media, agensi kerajaan, pertubuhan bukan kerajaan dan tempoh pemimpin masyarakat, integrasi dan komitmen dalam kerjasama untuk mencegah IGM. Menggunakan model kewartawanan kolaboratif dan teori pihak berkepentingan, kajian ini menggunakan reka bentuk penyelidikan kaedah campuran pelbagai peringkat (MMRD). Kajian ini pada masa yang sama merekrut 605 pelombong emas haram (dari kawasan kerajaan tempatan Anka, Maru dan Bukkuyum) menggunakan persampelan bola salji, dan mengenal pasti lapan pemberi maklumat wawancara dari media, agensi kerajaan, organisasi bukan kerajaan dan pemimpin masyarakat di Gusau menggunakan teknik persampelan variasi maksimum. Dengan menggunakan perisian SmartPLS, kajian kuantitatif mendapati bahawa pengaruh rakan sebaya adalah faktor utama yang mempengaruhi perlombongan emas haram di Nigeria berbanding dengan kenaikan harga emas, penglibatan penguasa tradisional dan rasa tidak puas hati dengan dasar sokongan kerajaan. Selanjutnya, hasil kesederhanaan tempoh, integrasi dan komitmen terhadap hubungan positif antara pengaruh rakan sebaya, kenaikan harga dan penglibatan penguasa tradisional dan emas haram menyokong hipotesis. Walau bagaimanapun, hanya hasil komitmen yang sederhana (bukan tempoh dan integrasi) mengenai hubungan positif antara rasa tidak puas hati dengan dasar sokongan kerajaan dan perlombongan emas haram menyokong hipotesis. Sebaliknya, hasil kualitatif menunjukkan peranan yang berbeza yang dimainkan oleh

media, agensi kerajaan, organisasi bukan kerajaan dan pemimpin tradisional dalam pencegahan perlombongan emas haram. Ringkasnya, gabungan kedua-dua hasil daripada analisis kuantitatif dan penemuan kualitatif menggunakan kaedah penggabungan telah mendedahkan kelemahan tempoh, integrasi dan komitmen dalam pencegahan aktiviti IGM di Zamfara, Nigeria. Akhir sekali, data empirikal menyokong pembangunan model kerjasama dan pencegahan media yang dicadangkan (MCPM).

INFLUENCE OF MEDIA COLLABORATION WITH STAKEHOLDERS IN THE PREVENTION OF ILLEGAL GOLD MINING IN ZAMFARA, NIGERIA

ABSTRACT

This study aims to investigate the elements that contribute to illegal gold mining (IGM) in Zamfara, Nigeria, as well as the duration, integration, and commitment of the media, government agencies, non-governmental organisations, and community leaders in collaborating to prevent IGM. A multilevel mixed methods research design was also used based on the collaborative journalism model and stakeholder theory (MMRD). Using snowball sampling, the study concurrently recruited 605 IGMs (from Anka, Maru and Bukkuyum local government areas). It also identified eight interview informants from media, government agencies, non-governmental organisations and community leaders in Gusau using the maximum variation sampling technique. Besides, using SmartPLS software, the quantitative study has found that peer influence is the major factor influencing illegal gold mining in Nigeria compared to the gold price hike, traditional ruler involvement and dissatisfaction with government support policy. Furthermore, the moderation results of duration, integration and commitment on the relationship between peer influence, price hike, traditional ruler involvement, and illegal gold supported the hypotheses. However, the hypothesis was supported by only the moderation results of commitment (not duration and integration) on the relationship between dissatisfaction with government support policy and illegal gold mining. On the other hand, the qualitative result showed the different roles played by the media, government agencies, non-governmental organisations and traditional leaders in preventing illegal gold mining. In a nutshell, the combination of both results from the

quantitative analysis and qualitative findings using the merging method have revealed the weaknesses of duration, integration and commitment in the prevention of IGM activities among media and stakeholders in Zamfara, Nigeria. Lastly, the empirical data supported the development of the proposed media collaboration and prevention model (MCPM).

CHAPTER 1

INTRODUCTION

1.1 Introduction

This chapter introduced the main focus of the study through background, context, and the study problem. The chapter also presented questions for the study, study objectives set to be achieved, the scope of the study, and an explanation of concepts most relevant to the study. Lastly, the chapter outlined the structure of the thesis.

1.2 Background of the Study

Illegal gold mining (IGM) is on the rise in many parts of the world, especially in African countries, and it causes environmental problems (Ofosua et al., 2020; Siqueira-Gay & Sánchez, 2021). Some of these problems include excessive shaft digging that affects farmlands. The chemicals used in the processing and refining of the gold contribute to the loss of vegetation, aquatic animals, soil, water, and quality air (Moses et al., 2018).

In recent years, literature has given significant comparable attention to the reasons for the rise of IGM and its environmental impacts in many other countries than Nigeria. For example, one of the most important challenges due to the increase of IGM activities in the Central Equatorial State of the Republic of South Sudan is depleting natural resources like the landscape, biodiversity and ecosystem (Ladu et al., 2019). In addition to environmental impacts, IGM activities' effects include political, social, security and health problems, which have greatly received attention in Nigeria.

In recent years, IGM activities in Nigeria have led to serial lead poisoning, mainly affecting children's and women's health (Bello et al., 2016). Médecins Sans

Frontières (MSF) reported a death toll of over 400 children from lead poisoning (Dada et al., 2019). Still, death occurs occasionally (Brown & Woolf, 2022; Graba et al., 2021), especially in the gold belt states of Nigeria like Osun, Kwara, Kogi, Niger, Kaduna, Kebbi, and Zamfara (Olade, 2019). Another related health problem is that sexually transmitted diseases are rampant in the IGM areas. Ajodo-Adebanjoko (2019) and Rozo (2020) traced sexually transmitted diseases like human immunodeficiency virus, an acquired immunodeficiency syndrome (HIV/AIDS), sexual violence, and a general threat to reproductive health from prostitution at IGM sites in Nigeria.

A study in French Guiana found that IGMs' migration brought social disruptions and domestic violence, leading to risky behaviours for transmittable sexual diseases (Douine et al., 2017). Evidence shows that IGM has increased assaults by armed bandits and kidnappers linked to IGM exploration (Oyewole, 2021). Also, it led to deteriorating educational development in the affected areas as the number of children dropping out of school increased (Ikechukwu-Ilomuanya et al., 2021). Politically, IGM brings corruption into the government cycle. Large-scale companies join forces with politicians interested in gold mining to circumvent rules. They also finance IGMs (Crawford & Botchwey, 2017) to get cheaply priced gold. Crawford and Botchwey (2017) have also shown the prevalence of unlawful selling of lands to IGMs by government officials for their benefit.

On the other hand, IGM is not without some benefits. According to Haundi (2021), one of the IGM advantages is the immediate and direct local economic improvement down to the household of illegal gold miners (IGMs). Several illegal artisanal and small-scale gold miners (ASGMs) are farmers. They use gold mining income to hire additional labour and buy fertiliser and other agricultural inputs in Sub-

Saharan Africa and Asia (Intergovernmental Forum (IGF), 2017). Some miners use illegitimate gold mining to build houses, buy cattle and cars, and even send children to school. In contrast, other gold miners invest in other businesses (Hilson, 2016).

Moreover, IGM contributes to providing jobs to rural women. Studies found that more women are in IGM. They prefer to work in low-risk jobs and indirect gold work like hauling, processing, hawking goods and services, carrying gold ore, and pounding rocks using mortar and pestles (Arthur-Holmes, 2021; Tirima et al., 2016). In Mali and Guinea, 50 and 75 % of IGMs, respectively, are described as women by IGF (2017). In contrast, Worlanyo et al. (2022) described that only 12.6 % were women in Asutifi-North in Ghana, as men are expected in Ghana to work and provide livelihood as heads of households. In general, women, children, and other vulnerable get better income from IGM than in otherwise livelihood-earning occupations (Hilson et al., 2018). Thus, the perceived benefits from IGM activities constitute part of the reasons the number of IGMs continues to increase by the day (Antwi-Boateng & Akudugu, 2020; Rozo, 2020).

As IGM activities increase, research examining factors related to IGM is growing. Some studies recognised the weak political will of governments as a factor in IGM. A group of scholars suggested low policy enforcement (Adu-Baffour et al., 2021; Espin & Perz, 2021). However, according to Worlanyo et al. (2022), the absence of decisive institutional factors, such as the readily available markets, training, and credit services, motivated farmers into IGM. Furthermore, Rettberg and Ortiz-Riomalo (2016) discovered that governmental and reputational factors provide a golden opportunity for decisions to engage in or abandon IGM activities. Other studies focused on socioeconomic factors stimulating IGM behaviour, including poverty level, perception of the lack of employment opportunities, especially after school, and deficient academic

performance (Baah et al., 2020). Though several studies have identified motivators for IGM, the majority of the studies are qualitative, with a concentration on demographic factors from Ghana (Adu et al., 2016; Ibrahim, 2018; Osei-Kojo & Andrews, 2020), Peru (Cuya et al., 2021; Smith-Roberts et al., 2021) and Guyana (Adamek et al., 2021; Hook, 2019). The literature trend indicated a shortage of information on the theoretical factors of IGM from Nigeria.

Despite the growing interest in IGM, research focusing on solutions to curb the problem is scarce. The current study argues for the importance of the role of media and other stakeholders in preventing the illegal activities of gold miners. Generally, scholars seem to focus on three angles in discussing the media's role in environmental harm and prevention. One group of studies investigated the role of communication mediums on e-waste and resource waste (Nanath & Kumar, 2021; Sujata et al., 2019; Wang et al., 2019a). Other studies directed attention to stakeholder engagement and management of waste and resources (Heath & Cotton, 2021; Torelli et al., 2020; Witzling et al., 2020). Nevertheless, more others reported preventing the impact of resource wastefulness (Luu, 2021; Pearson & Amarakoon, 2019; Pearson et al., 2017a; Strano et al., 2019). In a single study, scholars have not yet investigated factors of IGM together with the influence of media collaboration with stakeholders in preventing those factors (Kpienbaareh et al., 2021).

Past research suggests four key strategy-focused stakeholders in environmental communication: corporations or businesses, government, environmental pressure groups, and NGOs (Hansen, 2018). A large body of research has also examined the media as a critical stakeholder in collaboration. Media collaboration cut across various psychological, social and demographic factors of the public to shape the public's

perceptions of illegal coal mining (Yang & Wang, 2021), illegal logging (Belinga et al., 2021; Mbzibain & Tchoudjen, 2021), illegal dumping (Otwong et al., 2021), drugs abuse (Stead et al., 2019) and abortion (Kafu et al., 2021). Another set of scholars highlighted the possibility of media contributing to changing perceptions on illegal fishing (Rodriguez-Labajos et al., 2021) and illegal wildlife hunting (Kachen & Krishen, 2020), among others. Although past studies emphasised the importance of collaboration, these studies have loosely discussed the importance of media collaboration with stakeholders. In a recent study, Stout and Keast (2021) contested that collaboration should have emergent, relational and integrative dimensions. Though discussion on dimensions of cooperation such as duration, integration, and commitment of stakeholders is essential, except for Stonbely (2017), no studies treated these three dimensions of stakeholder collaboration exclusively.

This study aims to fill these gaps by examining the collaborative journalism model (Stonbely, 2017) to understand the role of duration, integration, and commitment in mitigating the effects of predictors to IGM using multilevel mixed methods research design (MMRD). This design in this study utilises quantitative data from the level of IGMs and qualitative data from media and other stakeholders' levels. This study, therefore, applied insights from the theory of the stakeholder approach and that of the collaborative journalism model. It is important to note that studies on IGM concentrate on some countries other than Nigeria, such as Ghana (Baddianaah et al., 2022; Osei-Kojo & Andrews, 2020), South Africa (Nesvet, 2020), Niger (Hilso et al., 2017), Côte d'Ivoire (Sauerwein, 2020), Zambia (Hilson, 2020), Peru (Cuya et al., 2021; Smith-Roberts et al., 2021), Brazilian Amazon (Siqueira-Gay & Sánchez, 2021), Colombia (Benites, 2022), Ecuador (Jiménez-Oyola et al., 2021), and Guyana (Adamek et al., 2021; Hook, 2019). According to Yoshimura et al. (2021), Nigeria is heavily involved

in IGM activities. Therefore, the number of IGMs in Nigeria was above one million in 2019 (Brady, 2020), up from 500,000 in 2011 (Hilson, 2016). Recently, nine billion US dollars were estimated to be missed annually due to IGM activities in Nigeria (Iroanusi, 2021). Similarly, Nigeria's Economic and Financial Crimes Commission (EFCC) has arrested gold valued at three million US dollars, believed to originate from Zamfara in 2018 (Brady, 2020). As such, this study focuses on one of the significant gold belts of Nigeria, Zamfara state.

1.3 Study Context: Illegal Gold Mining in Nigeria

Historically, the production of gold in Nigeria began in the 19th century up into the 1930s (Teriba, 2019). Gold production declined during the Second World War in the 1940s leading up to the Nigerian civil war in the 1960s and early 1970s (RareGoldNuggets.com, 2016). After Nigerian Independence, colonial and foreign companies abandoned mining sites (Olade, 2019). As a result, in the 1980s, the Federal Government of Nigeria (FGN) formed the Nigerian Mining Corporation (NMC) to explore gold (Teriba, 2019). Nigeria's solid minerals and mining sector contributed zero point five % to the Gross Domestic Product (GDP) in 2018 from five % in the 1960s (NEITI, 2019 in Okafor, 2019). Currently, no available records for the specific amount of gold produced in the country (Olade, 2019).

Generally, there are clusters of IGM activities with associated risks and problems in some regions of Nigeria. Nonetheless, in 2007, the Minerals and Mining Act was passed to carve out IGM activities. The Mining Act promised to ensure that those foreign and local investors with the necessary licenses and permits must carry out their right business in the nation unrestrictedly. The Act's creation was a pointer to the lingering disturbances of IGM in Nigeria. In particular, the Ministry of Mines and Steel

Development (MMSD) in Nigeria created a structure that collaborated with the local societies and the respective governments by creating the Committee on Mineral Resources and the Environment (CMRE) (KPMG Advisory Service, 2017).

Despite this effort, a recent report by Nigeria Extractive Industries Transparency Initiative (NEITI) disclosed that six states in Nigeria are the leading destinations for the illegal mining of solid minerals. Current NEITI estimates showed that between 2007 and 2016, the oil and gas sector added to the nation's economy three times what mining has contributed in the period under review (474 billion and 1.777 billion US dollars contributed by oil and mining, respectively). This deterioration in mining revenue is primarily due to illegal mining activities (Okafor, 2019). The report identifies Niger, Plateau, Ebonyi, Imo, Zamfara and Enugu states with seven illegally mined resources like gold, zinc, lead, tantalite, barites, and lateritic soil columbite and tin (Okafor, 2019).

Some studies linked IGM to a scarcity of gold mining information in Nigeria (Olade, 2019). The absence of large-scale gold mining companies (Teriba, 2019) amplified deficient gold mining information in Nigeria. The artisanal gold miners available are primarily illegal, not formalised and recognised by the government, contributing almost nothing to the formal economic sector (Raimi & Aslani, 2019). Nigerian government tends to lose about sixty-four million US dollars in revenue within two years (2016-2018). The revenue escape is because the produced illegal gold generally gets smuggled out of Nigeria, according to a former Nigerian minister of solid minerals, Abubakar Bawa Bwari (Abdulrasheed, 2021).

What seems to be aiding the smuggling of gold out of Nigeria could be partially related to the non-recognition of the two other tiers of government (state government and local government authorities) by the constitution of Nigeria before, during or after

the acquisition of gold mining license and land (Nigerian Minerals and Mining Act, 2007). The only reference made by the Mining Act 2007 to any other level of government is that of the State Mineral Resources and Environmental Management Committee (SMREMC). All mineral resources in the land belong to the Nigerian Central Government (Nigerian Minerals and Mining Act, 2007). Nevertheless, local and state government officials are closer to IGM than the Federal Government. These other tiers of government (state and local governments) can play an essential role if equipped with skills, knowledge, and authority. Moreover, they would play a better role if they collaborated with the media as a stakeholder (Weldegiorgis & Buxton, 2017).

On the other hand, Nigeria Minerals and Mining Act, 2007 is the official document with the statutory right to recognise artisanal gold mining as a legal entity and encourages registration after fulfilling some requirements. Under the Act, for an artisanal gold mining member to get a title lease, one must be a Nigerian and registered with the Corporate Affairs Commission (CAC). A lease of title for gold mining could not exceed three square kilometres. The Act also stipulated that the supervising ministry, MMSD, is responsible for offering extension services to formal artisanal small-scale gold mining (ASGM) operators. Among such services are training and new skills in technology, geological information, market opportunities, health and safety, plant and equipment for hire by leasing companies and facilities for testing gold grades, among others (Nigerian Minerals and Mining Act, 2007).

Interestingly, after observing the non-effectiveness of the Act, NEITI made suggestions to get Nigeria out of the IGM quagmire. The suggestions include good governance and transparency in (gold) mining, a robust regulatory framework, and a licensing framework to work, respectively (Okafor, 2019). In addition, the Nigerian

Senate passed a motion mandating the Senate Committee on Solid Minerals (SCSM) to develop a framework to prevent illegal artisanal (gold) mining on 2nd October 2019. The Senate responded to a call made by NEITI. NEITI also called on the Nigerian government to clean up areas and rehabilitate victims affected by lead poisoning in Zamfara State due to illegal artisanal gold mining activities (National Assembly, 2019). After a stint of contextual discussion on the IGM, the chapter will shift to the statement of the problem.

1.4 Statement of the Problem

Generally, scholars' attention to the challenges that come with IGM is plentiful in recent literature. Studies showed that IGM led to the contamination of the environment with lead metal, which resulted in the loss of lives (Taiwo & Awomeso, 2017). It caused child labour and the neglect of classrooms by children, inappropriate utilisation and subsequent pollution of the environment, corruption practices among traditional rulers and government officials (Salati et al., 2014), misuse of mercury (Brown & Woolf, 2022; Pona et al., 2021) and an instigator to armed conflict (Oyewole, 2021). Despite the severity of the IGM activities on the socio-economic existence of society, research on the influence of media collaboration with stakeholders for IGM prevention is limited.

This study is essential for several reasons. Firstly, there is a general paucity of empirical findings on influential factors of IGM in Nigeria. To date, what we know about factors of illegal artisanal gold mining activities remains speculative and confusing (Hasibuan et al., 2020). Bansah et al. (2018) pointed to wealthy persons' involvement in illegal artisanal gold rush-type, push-and-pull mining (Hilson, 2016; Maclin et al., 2017). Hilson and Maconachie (2020) attributed the likelihood of IGM to

the lack of solid policy planning and implementation. However, Osumanu (2020) related it to cultural values attached to gold mining, household size to take care of and rural livelihood issues. There is still uncertainty about whether the causes of IGM behaviour are household income deterioration and peer influence (Obiri et al., 2016). Similarly, some studies considered other factors of IGM, such as deficient formalisation procedures, gold mining, a seasonal job (Prescott et al., 2020) and traditional rulers posing as government agents (Hausermann, 2018). Consequently, insight gained from the study on the factors of IGM in Zamfara would be helpful for scholars to understand better and determine the most influential factors and for the media and stakeholders to plan a robust IGM prevention.

Consequently, scholars have left a wide gap on IGM factors. This gap created a lack of better understanding leading to confusion and sometimes contradictions on the causes of IGM in Nigeria. For example, Azumah et al. (2020) reported that IGM has led to peer influence, causing school dropout. This result is contrary to a finding affirming that pressure from a peer is a factor in IGM (Owusu et al., 2021). This apparent contradiction indicates that factors of IGM remain poorly understood. The present study aims to understand the exact and significant relationships between the factors influencing IGM in Nigeria. These factors include peer influence, price hikes, traditional ruler involvement and dissatisfaction with government policies. Explaining the aspects is expected to inform stakeholders in their policy intervention, taking appropriate measures to prevent IGM.

Secondly, several studies looked at the mitigation strategies of IGM (Eduful et al., 2020; Morgan et al., 2020; 2021). Nevertheless, these studies are mostly built on fields other than media and environmental communication. Furthermore, only a few

studies considered moderation in the IGM areas. They ignored the capability of restraint by the media collaboration with stakeholders. For instance, Nunfam and Afrifa-Yamoah (2021) have studied the moderation capability of barriers to a compelling adaptation of measures to prevent heat exposure on illegal artisanal gold miners in Ghana. Also, Sanfo's (2021) findings implied that neighbourhoods to IGM areas impacted schoolchildren's reading achievement. However, Sanfo's (2021) moderation component suggested that the effect may be conditioned by better teaching techniques and better central administration. Similarly, a moderation analysis by Ranjan (2018) found that when government officials face a low risk of the political overthrow, increasing conviction risk may not provide sufficient prevention of illegal mining of illegal mineral resources. Therefore, the other focus of this study is on the moderation competence of duration, integration and commitment of media collaboration with stakeholders to prevent IGM in Nigeria.

Lastly, empirical studies using a qualitative method in examining the role of media and other stakeholders' collaboration on IGM prevention are lacking. Scholars claim that preventing IGM requires multiple collaborative and preventive approaches (Asante Boadi et al., 2019; Espin & Perz, 2021). Despite media and other stakeholders' revealing significance, no substantial studies qualitatively explain their role in preventing IGM in Zamfara, Nigeria. However, recent studies like Brown and Woolf (2022) and O'Brien et al. (2021) reported attempts to stop IGM in Nigeria through the combined efforts of the Federal Government of Nigeria, states, local governments, communities affected, media, NGOs, donor countries and agencies. Still, qualitative studies for media-centred collaboration with other stakeholders to prevent IGM are missing. The stakeholders' attempts mentioned in the past studies mainly focused on preventing lead poisoning (Umar-Tsafe et al., 2019) due to IGM in Zamfara. In essence,

the limited qualitative studies in the Nigerian context on the influence of media collaboration with stakeholders on IGM prevention is a concern as the lack of it constrains a wider possible view of facts for solution providers.

1.5 Research Questions

This study seeks answer the following question: What causes IGM, and could a collaboration between media and other stakeholders prevent IGM in Zamfara, Nigeria? The question has four sub-divisions as follows:

1. What are the factors influencing IGM activities in Zamfara, Nigeria?
2. Could media and other stakeholders' collaboration (in terms of duration, integration, and commitment) reduce the effect of influential factors on IGM in Zamfara, Nigeria?
3. How could duration, integration and commitment in the collaboration between media and other stakeholders prevent IGM in Zamfara, Nigeria?
4. What model can be proposed for media collaboration and prevention in Zamfara, Nigeria?

1.6 Study Objectives

The main objectives of this study are to examine the factors of IGM and explore how collaboration between media and other stakeholders could influence the prevention of IGM activities in Zamfara, Nigeria. Objective one and two were examined quantitatively. Objective three was addressed qualitatively, while objective four was achieved by examining qualitative and quantitative data. The main objective has been broken down into four sub-objectives as follows:

1. To identify the influential factors that predict IGM activities in Zamfara, Nigeria.
2. To examine the role of media collaboration with stakeholders (in terms of duration, integration and commitment) in reducing the effect of influential factors on IGM in Zamfara, Nigeria.
3. To examine the role of collaboration (duration, integration, and commitment) between media and the stakeholders in preventing IGM in Zamfara, Nigeria.
4. To propose a media collaboration and prevention model (MCPM) to prevent IGM in Zamfara, Nigeria.

1.7 Significance of the Study

This research has addressed gaps in the collaboration of media and other stakeholders in preventing IGM. The novelty of this study is in the introduction of three moderating variables (i.e. duration, integration and commitment) in the field of environmental communication. The findings of this study demonstrate its significance to context, theory, method, and practical applications discussed as follows.

1.7.1 Theoretical

Scholars have not yet agreed on the individual factors of IGM (Bansah et al., 2018) and the moderating factors. On the moderating factors, the collaborative journalism model has assumed duration and integration as independent variables while commitment is dependent (Stonbely, 2017). Contrary to that, the present study has proved significant by determining the moderation nature of duration, integration and commitment in the influence of media collaboration with stakeholders to prevent IGM activities in Zamfara, Nigeria. By combining the collaborative journalism model (Stonbely, 2017) and stakeholder theory (Freeman, 1984), this study significantly

contributes to the current development of environmental communication literature and theories. In the section below, the study presents its methodological significance.

1.7.2 Methodological

Previous studies have heavily used the qualitative analysis of IGM as a study problem (Bansah et al., 2018; Hasibuan et al., 2020). Very few quantitative studies (Adu et al., 2016) on factors of IGM did not develop robust questionnaires with important theoretical factors. In this study, four main predicting, three moderating and five controlled variables were measured and tested using a questionnaire to guide the quantitative method.

However, looking at the exploratory nature of the topic under review and borrowing Harrison et al. (2020) and Headley and Plano Clark (2019), a qualitative method was combined with the quantitative in an MMRD. The path of mixed methods design is significant. The quantitative method harmonised the inherent generalisation weakness in the qualitative method while profiting from the in-depth information from the qualitative interviews (Creswell & Creswell, 2017). The data from the questionnaire were analysed using (SmartPLS software) partial least square-structural equation modelling (SEM-PLS) approach. PLS-SEM is advantageous for predicting key factors and extending existing theories and models (Ramayah et al., 2018).

Similarly, it was significant that the study used MAXQDA software to generate themes and analyse the interview data. The thematic approach was significantly flexible and improved data accessibility. Lastly, integrating findings from both qualitative and quantitative strands in a side-by-side joint display technique (Gutterman et al., 2015) was another critical contribution to the methodology. Next is a discussion on the practical significance of the study.

1.7.3 Practical

Remarkably, observing the factors provides policymakers with a fresh understanding of the linkages between the factors and the effect of IGMs activities in Nigeria (Salati et al., 2014). Hence, policymakers might consider the study findings in their action plan to help mitigate IGM activities. In the same vein, the study also has the potential to help policymakers find the roots of IGM, despite the government's claims that its policies support easy license acquisition (Nigerian Minerals and Mining Act 2007). Hasibuan et al. (2021b) recently implied that governments might not address IGM squarely without understanding the drivers.

Likewise, this study provides an exciting opportunity to advance our knowledge of the development of the local communities of Anka, Bukkuyum and Maru in Zamfara, Nigeria and their counterparts. Given that different studies have linked lead poisoning to IGM and made insignificant reference to stakeholder collaboration as a prevention mechanism (Olaitan & Okiei, 2021; Tirima et al., 2018; Umar-Tsafe et al., 2019); the empirical findings of this study are arguably the first in suggesting media and other stakeholder' collaboration as a solution to the growing illegal artisanal gold miners' activities' negative impacts in Zamfara, Nigeria.

Lastly, the study is also significant for the media industry to collaborate with stakeholders who share different objectives, aims, orientations, and challenges. Besides, the study's expected contribution is to the field of environmental and risk communication. Therefore, the research findings indicated implications about the twists, pros and cons, and obstacles that might come with such a media collaboration. The results then serve as yardsticks for other intending collaborators to understand their differences and similarities in better cooperating later to prevent the problem of IGM and

its equals. The examination of the moderating factors of IGM in Zamfara, Nigeria, constitutes this study's major novelty. What follows is a discussion of the study scope.

1.8 Scope of the Study

This study explores the influence of media collaboration with stakeholders in preventing IGM in Zamfara, Nigeria. By implication, the study did not attempt to encompass other states and countries in Nigeria and the African continent. Based on an in-depth review of the literature, the study limits its scope to some factors of IGM activities such as peer influence (Adu et al., 2016), price hike of gold (Martinez et al., 2021), traditional ruler involvement in IGM activities (Geenen, 2019; Hilson et al., 2019), dissatisfaction of gold miners with the approach of government on most of its supporting policies (Chen et al., 2019a), the perceived economic benefits in IGM (Dabbous, & Tarhini, 2019; Measham & Zhang, 2019), perceived positive outcomes (Jain & Humienny, 2020), age (Adu et al., 2016), educational level (Adu et al., 2016), and gender (Adu et al., 2016) of the IGMs. This study examines only the moderation effect of duration (Kazi et al., 2021), integration (Bowen et al., 2017; Rajabi et al., 2021) and commitment of stakeholders (Ratner et al., 2018) in the prevention of IGM. The determination of moderation constitutes the most significant novelty of this study. However, establishing mediation is beyond the present scope of this study.

The scope of the study was limited to IGMs from Anka, Bukkuyum and Maru local governments areas of Zamfara, Nigeria, who filled in 605 questionnaires. This study has also situated its interview scope with the two media organisations, two government organisations, two non-governmental organisations, and two traditional institutions from among the communities affected in Zamfara. Other stakeholders may

exist, but this study has ignored them to avoid deviation from, and focus attention on, the focal stakeholders.

1.9 The conceptualisation of main variables

Conceptualisation is the process of defining, theorising, refining, and specifying the meaning of abstract concepts or ideas to use as variables in a given study. That is to say, it is a procedure in which imprecise concepts become more specific and exact in meanings used by the survey (Rubin & Babbie, 2017). In essence, conceptualisation strips a concept from what it is not by saying what it is in the study by considering its various societal definitions/perceptions. This section identified 14 key terms used in this study and explained them below.

1.9.1 Illegal Gold Mining (IGM)

IGM has no universal definition; it is a multifaceted concept that differs from country to country (Kervankiran et al., 2016). For example, in Ghana, it is defined as "operations of individual Ghanaians or organised groups of Ghanaians (4-8 individuals), or a co-operative often of more individuals, entirely financed by Ghanaian resources at a certain limit, and carried out on a full-time basis using simple equipment and tools" (p. 175). However, miners' use of the equipment and their setting drew the attention of some scholars. Hilson et al. (2017) see illegal mining of gold to involve informal usage of "low-tech, labour-intensive mineral extraction and processing – in developing countries" (p. 80). Gold miners, in this definition, have reduced access to markets, low standards of health, safety and environmental protection (Buxton, 2013), and without governmental lease or title (Seccatore et al., 2014). In this study, IGM is referred to as gold mining by local people without a license, title and regard to government rules on the environment, health and tax.

1.9.2 Peer Influence

Willingness to identify, conform to expectations, accept information (Adu et al., 2016) and get recognised (Bolay, 2014) from friends and associates regarding IGM activities. A large body of literature investigated the processes through which peer influence works. Peer influence can occur directly by offering to mine gold together and indirectly through social learning and perceived norms (typical of others). Peer perception of others' norms can take the form of perceptions about the regularity of the other's gold mining (descriptive norms) and perceptions about other's endorsement of gold mining (injunctive norms) (DiGuiseppi et al., 2018; Lac & Donaldson, 2021; Sheer, 2021). Peer in this study is the level to which closeness to other IGMs motivates a particular illegal gold miner's participation in IGM activities.

1.9.3 Price Hike

The gold price hike perception is the IGMs' optimism of a continuing gold price increase (Livieris et al., 2020). The literature on the economics of crime, pioneered by Becker (1968), dominated the price hike concept. In this circle of literature, an offender is a utility-maximising agent who assesses the personal benefits from the price of the product, service or idea and commits the offence if the gain exceeds the anticipated price (Jamil, 2018). This study sees gold price hikes as the motivation an illegal gold miner receives from rising gold prices and engaging in IGM.

1.9.4 Traditional Ruler Involvement

Grunig and Hunt (1997, p. 10) defined involvement as "the extent to which people connect themselves with a situation" (p. 152), like IGM. According to Heath et al. (1995), involvement has two dimensions: support-involved and opposed-involved. In contrast to opposed-involved persons, support-involved persons are akin to

traditional rulers whose direct and indirect involvement supports the worsening of IGM activities. However, the “Involvement” of traditional institutions is vital in managing gold mining traditions. Scholars have a widespread interest in traditional rulers, community leaders and top managers in IGM (Adu-Baffour et al., 2021; Ayinpoya-Akafari et al., 2021). Traditional ruler involvement is critical and sometimes satisfactory to ensure IGM performance (Denisova, 2020). In this study, traditional ruler involvement means the way and manner, attitudes and actions of traditional rulers encourage IGMs’ activities.

1.9.5 Dissatisfaction with Government Policy Support

Non-provision of or inadequate support by the relevant government (Espin & Perz, 2021) due to control and delay of the title lease that encourages gold miners’ inability to obey rules is considered displeasure with the government support policy. Like dissatisfaction with government support policies, anti-social attitudes are related to a lack of confidence in authority and tolerance for law infractions. Thus, scholars expected miners to exhibit four characteristics in response to dissatisfaction with government services and policies (Peeters et al., 2020). These characteristics include exit, voice, loyalty and neglect. Exit is a means of showing policy dissatisfaction, which is commonly manifested by engaging in improper behaviour with current policy, for example, bypassing legal activities [such as gold mining]. At this moment, citizens begin (or return) to an alternative, non-governmental, illegal activity, rule-breaking, called "quasi-exit" by political scientists (Peeters et al., 2020; 2021). Dissatisfaction with the government support policy is defined here as the level to which IGMs express displeasure with government policies on support to the local gold miners.

1.9.6 Duration

Duration is the extent participation in collaboration remains (NCI Thesaurus, 2019). Productive collaborations entail sustained time and effort (Dania et al., 2018). Arvitrida et al. (2017) see duration as the length of time taken by a partnership in a relationship. As a moderator in a previous study, duration has been in different terms. For example, it is called the duration of relationships (Lee et al., 2015; Malik, 2020). In this study, duration is how media and stakeholders' participation in collaboration decreases or increases IGM.

1.9.7 Integration

Integration contains mutual understanding and a shared vision to share resources for collaboration to achieve set objectives (Gee et al., 2019). Moreover, Gee et al. (2019) state that more integrated firms perform better than less integrated firms. Scholars previously defined it as bringing together different groups, purposes or organisations through physical or technological to simultaneously and conjointly work on common problems (Monczka et al., 2015). Conversely, for Auschra (2018), integration connotes the coming together of different personnel with areas of expertise involved in a problem-solving situation. Integration could explain the quality of collaboration across departments that expected unity of effort by the demands of their environment (Danso et al., 2020). Integration in this study refers to the level to which attention given in working together or separate in the collaboration by media and other stakeholders could decrease or increase IGM activities in Nigeria

1.9.8 Commitment

Commitment is a sustained interest in keeping a valuable relationship (Fei et al., 2021). In a relationship, commitment and trust are the key mediators in an interchange

among stakeholders, leading to a relational collaboration. As a variable, commitment has often been a relational mediator (Brown et al., 2018). In long-time relationships, commitment occurs when partners believe their ongoing relationship is vital. They should make every effort to keep it going. That means the extent partner believes that an ongoing relationship with another is essential to warrant maximum efforts at maintaining the relationship (Brito & Miguel, 2017). In this study, commitment means maximising the determined effort of media and other stakeholders' collaboration to decrease or increase IGM in Nigeria.

1.9.9 Collaboration

Collaboration refers to the involvement of "stakeholders and the public in the process of consensus building to address some of the most difficult environmental management problems" (Margerum, 2008, p. 487).

1.9.10 Multilevel

Multilevel is having more than one unique sample of different levels (e.g., parent level and children level; teachers and students' level; IGMs' level and media stakeholders level, etc.) to collect data from, in a parallel or sequential manner (Teddlie and Tashakkori, 2009).

1.9.11 Divergence

A relationship in which qualitative and quantitative results were inconsistent (Bustamante, 2019).

1.9.12 Convergence

Consistencies between qualitative and quantitative data (i.e.: confirmation) (Bustamante, 2019).

1.9.13 Expansion

Expansion happens when only data from either the quantitative or qualitative method provides insight (Bustamante, 2019).

1.9.14 Joint visual display

A joint display data presentation approach is the visual integration of data to get additional insights beyond the information gained from the individual quantitative and qualitative method outcomes (Guetterman & Fetters, 2022).

1.10 Outline of Chapters

This study covers six chapters, divided into two main parts. The first part included the first three chapters (one to three), which formed the essential parts of the study, introduction, literature and methods used. The second part narrated the data collected quantitative and qualitative results and a discussion of the results as explained in detail below.

Chapter One is a general overview that introduces the study, the background of the study, contextual summary of IGM in Nigeria. It stated the problems the study identified, research questions that guided the study, objectives, significance, and scope.

In Chapter Two, the study reviewed and coalesced the relevant literature on the artisanal and small-scale IGM trends, and the strategies and the challenges of media in collaborations were highlighted. The chapter also underscored the main theories that undergirded the study framework and integration of the perspectives of the theories and the significant influencing and moderating variables. It also presented the study's conceptual model and hypothesised relationships' statements.

Chapter Three is on the methodology and provides detailed explanations of the MMRD. The mixed methods comprised quantitative and qualitative strands. In the quantitative strand, the method has particularly highlighted the survey method on IGMs, their population, sampling technique and size, questionnaire instrument, reliability and validity test. The chapter also discussed expert panel, pilot study and data analysis techniques. On the other hand, the qualitative part of the chapter explained the use of an in-depth interview in the study. This segment covered interview informants' selection criteria, assessment of interview questions, pilot interviews, codes and themes development and analyses. It further explained the integration method of quantitative and qualitative results, ethical considerations, and consent from Jawatankuasa Etika Penyelidikan Manusia, University Sains Malaysia (JEPeM-USM).

Chapter Four presented the quantitative results from the survey questionnaire with 605 IGMs. It included descriptive analyses of gold miners, variables' characteristics and correlations. It also enclosed an assessment of measurement and structural models. In essence, the chapter responded to research questions one and two.

Correspondingly, Chapter Five was a response to research question three. The chapter comprised findings from the interviewees, including profiles and themes generated from the interview data. The data include the role of media and other stakeholders, the influence of duration, integration, and commitment in stakeholder collaboration to prevent IGM. The chapter also merged some selected qualitative themes with quantitative scores for meta-inferences.

Chapter six mainly summarised the study and juxtaposed the four research objectives presented in the first chapter against the quantitative and qualitative results presented in Chapter Four and Chapter Five. The chapter discussed the side-by-

side joint display data integration; implications were also discovered and deliberated concerning the study's wider theoretical and empirical interests. That is to say, where possible, the findings of this study were compared with existing theories, models and empirical findings to draw on patterns, and discover similarities, nuanced differences and new insights. Because the ultimate goal of this study was to introduce a proposed new model, the study offered a discussion of the empirical data supporting the development of the model. The study presented theoretical, methodological, and practical contributions. It also offered limitations and recommendations for future studies.

1.11 Summary

In summary, this chapter is an introduction that lays the ground on the issue of IGM and stakeholder preventive collaboration. In addition to the contextualisation of IGM and stakeholder collaboration, the chapter stated the research problem, outlined the research questions, and set the research objectives. The chapter also identified the significance of the study, discussed the main study focus, and lastly outlined the study chapters.