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Governance Structures and Conflict Mitigation Strategies In Food Supply Chains: Evidence From Niger State, Nigeria

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ABSTRACT

Food supply chains in fragile and semi-institutionalised economies continue to experience persistent instability driven by weak governance structures and recurring conflicts among market actors. However, despite extensive studies on food system challenges in Nigeria, there remains limited empirical understanding of how governance structures interact with conflict mitigation mechanisms to shape system stability at the local market level. Available literature tends to treat governance and conflict management as separate processes, thus overlooking their interdependent dynamics within everyday market operations. This study addresses this gap by examining governance structures and conflict mitigation strategies in food supply chains in Niger State, Nigeria. Anchored on Systems Theory, it conceptualises the food supply chain as an interconnected system where institutional arrangements, actor interactions, and structural constraints jointly determine stability outcomes. A mixed-methods design was adopted, involving survey responses from 361 participants selected using Krejcie and Morgan sampling technique,

complemented by key informant interviews. Quantitative data were analysed using regression analysis, while qualitative data were thematically examined to enrich interpretation. Findings show that governance effectiveness is significantly shaped by rule clarity (β=0.421), dispute resolution mechanisms (β=0.389), and enforcement structures (β=0.268), while fairness of levies remains relatively weak. Conflict mitigation is largely driven by market associations (β=0.447) and dialogue processes (β=0.402), signifying strong reliance on informal institutions. However, structural factors such as price fluctuations (β=0.401) and competition intensify conflict occurrence, revealing systemic vulnerability beyond governance capacity. The research contributes theoretically by advancing a systems-based explanation of governance–conflict interdependence, empirically by demonstrating the dominance of informal institutions in stability formation, and policy-wise by stressing the need for transparent governance reform and integrated conflict management frameworks in food markets.

Keywords: **Governance, Conflict, Markets, Systems, Mitigation, Supply Chain**

INTRODUCTION

Food security remains a major global concern with significant implications for economic stability, livelihoods, and human well-being across developed and developing countries (Food and Agriculture Organisation, 2023; World Food Programme, 2024). Beyond production constraints, contemporary debates on food insecurity increasingly emphasise the role of governance structures and institutional effectiveness in shaping food access, market coordination, and supply chain sustainability (IFPRI, 2022; World Bank, 2023). Consequently, scholarly attention has shifted towards food supply chain governance, particularly issues relating to coordination, transparency, regulatory enforcement, and institutional accountability (Reardon & Timmer, 2012; FAO, 2021; Ajiboye, 2023). Existing studies further demonstrate that food systems are highly vulnerable to economic shocks, climatic variability, and socio-political conflicts that disrupt production networks and market linkages (Ajiboye et al., 2024b; Almasri et al., 2025).

In many developing countries, food supply chains operate within fragile institutional environments characterised by weak regulatory capacity, fragmented markets, and inconsistent policy implementation (Adeyemo & Aloysius, 2025). These conditions are further exacerbated by conflicts such as farmer–herder violence, communal clashes, and rural insecurity, all of which undermine agricultural production and market integration (Ajiboye et al., 2024b). Although previous studies have established connections between weak governance systems and rising transaction costs within food markets, much of the existing literature remains largely descriptive. Existing studies largely treat governance failure and insecurity as parallel variables rather than mutually reinforcing processes shaping supply chain resilience, coordination, and operational stability. Consequently, limited scholarly attention has been devoted to explaining the mechanisms through which governance structures interact with conflict dynamics to influence food supply chain performance.

This represents an important analytical gap in current scholarship. In Nigeria, governance deficiencies and insecurity have significantly disrupted food supply systems across several regions. Rural banditry in the North West and North Central, Boko Haram insurgency in the North East, and communal conflicts in other parts of the country have adversely affected agricultural production, transportation networks, and market operations (Hamza et al., 2022; Izom, 2023; Sadiq et al., 2024; Lamidi, 2025). These disruptions have reduced food output, weakened market accessibility, and increased price instability, thereby threatening food availability and affordability. At the same time, weak regulatory enforcement, poor market coordination, and limited institutional responsiveness have intensified these challenges (Ibrahim & Ya'u, 2025; Umearokwu & Musa, 2025). While several studies examine the effects of insecurity on agricultural production, fewer studies empirically analyse how governance arrangements and conflict mitigation strategies jointly influence the performance and resilience of food supply chains.

This condition is particularly evident in Niger State, one of Nigeria's major agrarian states and a critical contributor to national food production. However, persistent insecurity, especially rural banditry and communal conflicts in areas such as Shiroro, Munya, Borgu, and Paikoro, has severely disrupted agricultural activities and market operations (Ajiboye, 2023; Ajiboye et al., 2024b). These disruptions have weakened supply networks, increased market uncertainty, and reduced the efficiency of food distribution systems across the state. Despite these realities, empirical research examining the interaction between governance structures and conflict mitigation mechanisms at the sub-national level remains limited. Most existing studies focus either on governance deficiencies or the consequences of insecurity without sufficiently explaining how both dynamics interact systemically to produce resilience or fragility within food supply chains. This study addresses this gap by providing a systems-based analysis of how governance structures and conflict mitigation strategies shape food supply chain performance in Niger State, Nigeria.

Research Questions

This study is premised on these research questions: 1. What market governance mechanisms regulate the activities of actors within food supply chains in Minna, Niger State? 2. How effective are the existing conflict mitigation strategies in resolving disputes among actors in the food supply chains in Minna, Niger State?, 3. What challenges affect market governance and conflict mitigation within the food supply chains in Minna, Niger State?

Research Objectives

The major thrust of this study is to evaluate market governance and conflict mitigation in food supply chains in Minna, Niger State. The specific objectives of the research are: 1. To examine the market governance mechanisms regulating the activities of actors within food supply chains in Minna, Niger State. 2. To ascertain the effectiveness of conflict mitigation strategies used to manage disputes among actors within the food supply chains in Minna, Niger State. 3. To identify the challenges affecting market governance

and conflict mitigation within the food supply chains in Minna, Niger State.

Conceptual Clarification

Market governance, conflict mitigation effectiveness, and food supply chain resilience are interconnected factors that regulate the stability and productivity of food systems. Market governance can be defined as the institutional arrangements, regulatory frameworks, and coordination mechanisms that structure interactions among actors within the food supply chain, guaranteeing effectiveness, impartiality, and accountability. Available studies show that governance plays a vital role in shaping market outcomes by impacting power relations, allocation of scarce resources, and coordination of the system (Reardon & Timmer, 2012; Clapp, 2021). Weak governance structures are regularly linked with inadequacies, market errors, and reduced system performance. Operationally, market governance is assessed through measurable indicators such as the success of regulatory implementation, transparency in market transactions, functionality of market associations, competence of dispute resolution procedures, and the level of coordination among main participants within the supply chain.

Conflict reduction effectiveness reflects the capacity of organisational and informal mechanisms to avert, manage, and resolve disagreements arising within food systems, mostly under circumstances of stress and indecision. Within resilience-oriented background, effective conflict management is indispensable for sustaining system functionality, as unsettled arguments can heighten into systemic disturbances (Béné et al., 2016). This agrees with the broader belief that food systems are constantly exposed to shocks and need adaptive mechanisms to maintain operations. In operational terms, conflict mitigation effectiveness is measured adopting indicators such as the speed used in resolving conflicts, accessibility of mediation structures, occurrence of unresolved or periodic conflicts, fulfilment of members with resolution outcomes, and the existence of preventive conflict management mechanisms within the market setting.

Food supply chain resilience deals with the ability of the system to absorb, adapt to, and recover from disturbances while upholding stability and continuity of food flows. This concept is extensively conceptualised as a dynamic property of food systems, influenced by adaptive capacity, flexibility, and alertness to shocks (Tendall et al., 2015; Barrett, 2020). Additionally, policy and governance mechanisms play an important function in consolidation of resilience by augmenting system receptiveness and reducing susceptibilities (Pingali, 2015). Operationally, resilience is measured through indicators such as continuity of food supply during interferences, longer stability of food prices, and extent of the system swiftly recovering from internal or external shocks, adaptability of means of supply and delivery, and continued participation of actors within the food supply chain in spite of hostile circumstances.

Empirical Review

Various empirical studies have been carried out by researchers at global, regional and local level on the relationship between

market governance and conflict mitigation in food supply chains. Adeyemo and Aloysius (2025) examined the relationship that exist between trade facilitation and food security in West Africa. The study used a panel data method, the analysis examined the influence of customs management on food security, bearing in mind business environment, information, and communication technology (ICT), and electricity as control variables. The research found that proper customs management considerably improves food security, with governance playing a vital responsibility in enhancing this impact. The research indicates that that enhanced governance arrangement improves the positive effects of facilitating trade at various borders across Africa, causing a 22% surge in customs management effectiveness. Besides, a well-coordinated business environment, improved technology utilisation, and consistent electricity availability are recognised to add clearly to food security. The findings reveal the significance of effective and comprehensive governance style and development of local infrastructure in realising viable food systems and sufficiency of food in African regions.

Similarly, Ugbong, Imeh and Undiukeye (2025) investigated the impacts of political system and governance on food security in the South-South geopolitical zone of Nigeria. The study adopted and used correlational research design. The research selected three states from the South-South geopolitical zones and one thousand two hundred (1200) participants were picked for the research using simple random sampling methods. The instrument used to collect data for the study was a four point's Likert scale questionnaire and twenty (20) oral interview questions were adopted to gather significant data from the participants chosen for the research. The result shows a positive relationship between political system adopted, policy implementation and food security in the location of the study.

Relatedly, Ibrahim and Sani-Yau (2025) adopted the theory of primitive capitalist accumulation to investigate the connection between failure of governance and food insecurity in Nigeria. Utilising secondary data from trustworthy studies, as well as scholarly journals, studies from international organisations, and document produced by government, the work indicates how Nigeria's governance settings affect food insecurity. The result further shows how corruption is demonstrated through grabbing of people's lands, which leads to displacement of smallholder farmers from their farms and properties, abuse of agricultural properties, and worsen food insecurity. The results show that tackling food insecurity in Nigeria needs transformative governance changes that acknowledges the well-being of smallholder farmers, encourage impartial land distribution, and guarantee transparency and responsibility in agricultural policies formulation and implementation.

In a study related to conflict and food supply chain, Ajiboye (2023) investigated the level of rural armed banditry and the influence of armed banditry on the yam supply chain and local communities that focus on agricultural activities as their livelihood. The study adopted and used a simple random sampling method to select the participant for the study. Additionally, the research adopted and

utilised a well-structured questionnaire to gather significant data on the effects of armed banditry on those who engage in agricultural activities, drivers of public transport, and agro-food traders in three main yam markets, namely Garatu, Paikoro, and Gwada. Similarly, the research collected data from major stakeholders through the use of interviews. The analysis of data gathered was done through descriptive and statistical methods. The research shows that rural armed banditry has a damaging effect on agro-food production, available transport networks and trading in the study area, leading to inadequate agricultural productivity and an extreme cost of agricultural produce and movement of goods and people through public transportation. The study recommends that government should place a high premium and emphasis on the protection of people's lives as well as properties in the study area security. Further, local vigilante groups and formal security institutions should be well motivated and provided with adequate facilities and tools to curb rural banditry.

Also, Umeoka and Sakurai (2025) examined the direct economic and trading shocks that reconcile the connection between conflict and agricultural activities in Nigeria. The research adopted a linear probability model with household fixed impact to evaluate balanced panel data from the Nigerian General Household Survey (GHS), which were combined with georeferenced conflict data from the Armed Conflict Location & Event Data Project (ACLED). This method allowed the study control overlooked household-specific features and investigated regional differences in conflict-related shocks. Result of the study show that considerable regional heterogeneity in the measures through which conflict impacts agricultural activities. In the Northern parts of Nigeria, conflict is predominantly connected with both increased farm theft and upsurge of prices related to agricultural produce, possible motivated by changes in supply and severe threats of insecurity. Contrastingly, in the Southeast, amplified conflict is associated to a little increase in farm theft and a decline in output amounts, signifying overproduction and comparatively greater levels of farm security. These conflicting results show that the corridors through which conflict influences agriculture vary evidently across areas, underlining the necessity for context-specific policy action.

Theoretical Framework

Systems Theory

This study is guided by system theory which was originally propounded by Ludwig von Bertalanffy, states that systems are comprised of interconnected and interdependent parts whose relations define the performance of the entire system (Bertalanffy, 1968). The theory and its assumptions have been extensively used in studies and literature disaster risk management, transport management and purchasing and supply to investigate and interrogates how multifaceted systems react to challenges and disturbances. Recent empirical studies reveal that agri-food supply chains are defined as intricate adaptive systems comprising numerous actors which includes local farmers, those who engages in the processing, the transporters of the produce from the farms, the available wholesalers as well as the small retailers,

whose relationships shape the entire performance of the system (Stone & Rahimifard, 2018; Zhao et al., 2024).

In this direction, this theoretical framework is vital because it recognises the various connection that occur in the whole system, the available feedback loops, and general weakness. In line with disaster risk management, food supply chains are more and more identified as systems open to numerous and connected hazards, where disturbance in one part can create significant impacts across the whole network (Perdana et al., 2022). For example, disruptions related to socio-economic conflicts can influence output and activities related to agriculture, available means or methods of transportation and local access to community markets at the same time, thus affecting the availability of food and instability of food prices within the community (Ajiboye, 2023; Ajiboye, et al., 2024b; Ajiboye, Ihenancho & Soomiyol, 2025). Furthermore, the system shows that such disturbances are not event that happened solely but instead system-wide shocks that spread through inter-reliant parts.

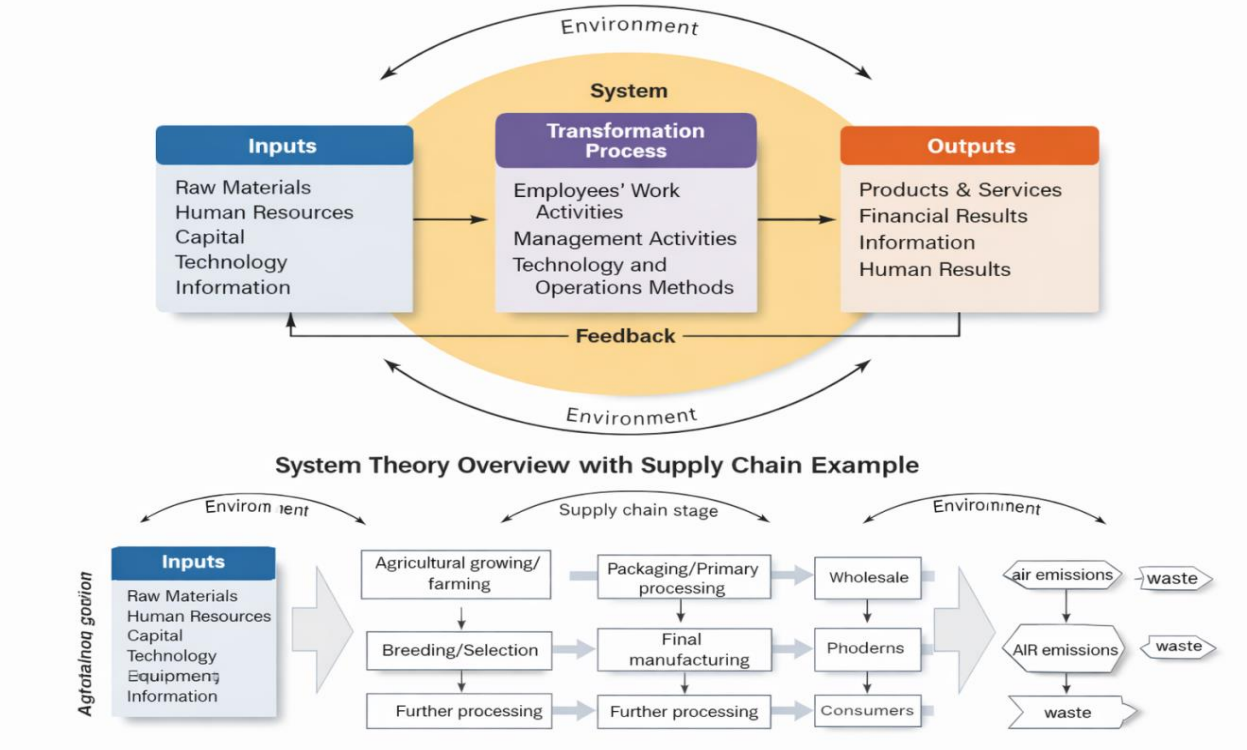
In agreement with the system theory, this present study argues that the food supply chain in Niger State can be defined as an open system comprising of key inputs, processes involved, outputs, and feedback tools. As such, resources related to agriculture, manpower, political system and the type of governance, available infrastructure, and the level of security available are all the inputs of the system. Further, the measures of storage adopted, modes of transportation and marketing activities as well as the exchanged are classified under the processes. These inputs and processes reflected on the ease of food accessibility, availability and also how stable the prices of food are in the community markets which are all referred to as the outputs of the system. Lastly, this study opines that vital policy interventions by the government, regulation of the local and regional markets and security strategies adopted to reduce conflicts so as to have some level of sanity in the system are known as the feedback (Singh, Kumar, Panchal, & Tiwari, 2021).

To this end, Figure 1 shows the general system model, and Figure 2 explains how the theoretical framework relates to a real-world food supply chain in Niger State. Figure 1 indicates that every system comprises of inputs, a conversion process, and outputs. Inputs which comprise of man, available materials, funding, use of technology, and information are changes via institutional procedures comprising staff' work, activities involving managers, and methods of operations adopted. The outputs comprise products, services, monetary effects, and information. Also, feedback assists to enhance the system, while the environment impacts all parts.

Figure 2 connects system theory to a supply chain. It indicates how inputs like available water, energy, modes of transportation, equipment, and materials move through various phases: agricultural activities, breeding/selection, processing, production, delivery, and consumption. At every single level, inputs are changed into outputs, while waste and emissions are created. The significance of systems theory becomes more obvious when investigating the influence of banditry and inadequate security on food supply chains. Thus, insecurity such as rural

armed banditry, terrorism, clashes between farmers and herders can significantly affect agricultural activities, production of goods, and proper movement and distribution of products ready for supply within the communities and along supply routes in Niger State.

Figure 1 & 2: General Systems Model



Source: Adapted from Bertalanffy (1968) and Easton (1953, 1965)

METHODS

This research is carried out in Minna, the capital of Niger State. Minna which has become a well-known commercial and administrative location with working agricultural and activities related to food supplies. Niger State is mainly agrarian, with a large part of its population engaged in agriculture, buying and selling, and commercial transportation of agricultural farm produce. The existence of key markets such as Abdulkadir Kure Ultra-Modern Market, Kasuwar Gwari/ Old market, Tunga, market, and Bosso markets located in Chanchaga Local Government Area and Tunga Goro, Maikunkele, Chanchaga and Maitunbi markets in Bosso Local Government Area. All within Minna Metropolis makes Minna a deliberate location for food supply chains. On the other hand, the area has been impacted by growing

insecurity, caused by rural banditry in areas like Shiroro area in Shiroro LGA, Zungeru area in Wushishi LGA, Tegina / Kagara area in Rafi LGA and Sarkin Pawa in Munya LGA, which have affected agricultural activities and market distribution systems (Ajiboye, 2023; Ajiboye, et al., 2024b; Kandi & Dibal, 2024; Ohida, Isa, Ajiboye. & Yusuf, 2025; Ajiboye, et al., 2025).

Data Collection

This study used a concurrent mixed-methods design to collect data simultaneously from both qualitative and quantitative sources. The quantitative part deals with the use of a well-structured and closed ended likert questionnaire. On the other hand, the qualitative part of the study utilised Key Informant Interview (KIIs). The use of the aforementioned methods is justified as it allows the study to gather both numerical data and in-depth views into difficult social phenomena. As such, Creswell and Creswell (2018) buttressing the above, argued that the methods offer a more inclusive understanding of research problems by merging the advantages of both quantitative and qualitative methods. The population of the research is made up of people participating in the food supply chain in Minna. This comprises registered farmers, traders that are wholesalers, retailers, commercial drivers that transport agricultural produce within and outside Minna, and registered members of various market groups and associations.

From available records from the Niger State Ministry of Agriculture (2026), registered and recognised market registers (2026), and information derived from Niger State Bureau of Statistics (2026), the targeted population size is 12,741. The use of this population is justified as it contains various groups of stakeholders whose work impacts food supply chains and market governance arrangements in the area of the study. To arrive at a manageable sample size, the research adopted the Krejcie and Morgan (1970) table for sample size determination, which is extensively utilised for large populations. For a population of about 12,741, the recommended sample size is 377 participants. The research adopted a combination of stratified and purposive sampling methods. Stratified sampling was utilised to make sure that all parts of food supply chain actors (farmers, traders, wholesalers, commercial transporters, and market association members) were sufficiently embodied in the study. This method is suitable because it increases representativeness by separating the population into similar subgroups (Kumar, 2019).

For the qualitative part of the study, the research adopted a purposive sampling method to pick major informants such as market leaders, officials from government, and security personnel who enjoy in-depth knowledge of market governance and issues related to conflicts. The adoption of purposive sampling enabled the study to select respondents based on their significance and knowledge (Creswell & Creswell, 2018). Saturation theory guided the numbers of respondents selected for the interviews. The principle of data saturation, which happens when no new information materialises from further interviews (Guest, Bunce, & Johnson, 2006).

Table 1: Demographic of Respondents
Source: Field Survey, 2026

Characteristics		**Frequency**	**Percentages**
Sex	Female	147	40.7
	Male	214	59.3
	Total	361	100.0
Age Group	18 – 25	40	11.1
	26 – 35	100	27.7
	36 – 45	109	30.2
	46 – 55	76	21.1
	56 and above	36	10.0
	Total	361	100.0
Educational Level	No Formal Education	41	11.4
	Primary Education	86	23.8
	Secondary Education	137	38.0
	Tertiary Education	97	26.9
	Total	361	100.0
Role in Chain Supply	Farmer	77	21.3
	Food trader/Retailer	125	34.6
	Food wholesaler/Distributor	70	19.4
	Market Association Member	36	10.0
	Transporter of Agricultural Produce	53	14.7
	Total	361	100.0
Years of Experience	1-5 years	61	16.9%
	6-10 years	115	31.9%
	11-15 years	97	26.9%
	16 years and above	88	24.4%
	Total	361	100.0

Data Analysis

The data collected through quantitative methods from the questionnaire were analysed by adopting descriptive and inferential statistics. Descriptive statistics such as frequency counts, percentages, means, and standard deviations were used to summarise the data. As observed by Pallant (2020), these statistical methods are suitable for classifying patterns and testing

interactions between variables. Contrastingly, qualitative data collected through semi-structured interviews were thematically analysed. In justifying the use of

thematic analysis, Braun and Clarke (2006) postulate that thematic analysis is a flexible and rigorous technique for analysing qualitative data, assisting the study to deduce meanings and draw inferences.

RESULT AND DISCUSSION

From the 377 copies of questionnaire administered, 361 (95.8%) were retrieved, valid, and used for analysis, showing a high response rate and reliability of the dataset.

The socio-economic characteristics of participants in Table 1 provides important insights into the structural composition of the food supply chain in Minna and how these characteristics influence governance outcomes and conflict dynamics. The findings indicate that male participants accounted for 59.3%, signifying that men dominate governance-related roles within the food supply chain. Conversely, the comparatively high representation of female respondents (40.7%) shows that women play a substantial role, predominantly in trading and retail activities. This echoes a gendered division of roles in which men are more involved in decision-making and control structures, while women are dynamically engaged in operational and transactional parts of the supply chain.

In terms of age distribution, the majority of participants fall within the economically active age group of 26–45 years (57.9%), demonstrating that the food supply chain is mainly driven by a productive and economically active population. This reveals a high possibility for adaptive capacity and innovation, which are vital for resilience in the face of disturbances. Educationally, most participants possess at least secondary education (64.9%), reveals a reasonable level of literacy that can ease understanding of market rules, agreement with regulations, and involvement in governance processes. Nevertheless, the presence of respondents with low or no formal education may affect actual engagement with formal governance structures, thus strengthening dependence on informal mechanisms. The distribution of roles indicates that traders/retailers (34.6%) comprise the largest group, followed by farmers and wholesalers/distributors. This reveals that governance dynamics are expected to be strongly impacted by market-based actors whose main concern is price stability, access, and profit margins. Therefore, governance arrangements may be shaped more by commercial interests than by collective regulation, which can build tensions and conflicts within the system.

Table 2: Regression Analysis of Market Governance Determinants

Predictor	Beta (β)	t-value	Sig.
Rule clarity	0.421	8.112	0.000
Enforcement of regulations	0.268	4.393	0.000
Fairness of levies	0.143	2.598	0.010
Dispute resolution mechanisms	0.389	6.707	0.000

$R = 0.781$; $R^2 = 0.610$; $F = 142.36$; $p = 0.000$

The regression model explains 61% of variation in market governance effectiveness, signifying a strong predictive capacity. The findings as shown in Table 2 reveals that governance in Minna markets is shaped by a hierarchy of institutional forces rather than a single dominant factor. Rule clarity (β = 0.421) is the strongest determinant, indicating that when rules are clearly understood and accessible, governance effectiveness increases significantly. This means that governance is mainly cognitive and interpretive in nature. Dispute resolution mechanisms (β = 0.389) follow closely, indicating that informal mediation structures play an important stabilising role in governance operations. Enforcement of regulations (β = 0.268) has a moderate effect, meaning enforcement contributes but is not the main driver of compliance. Fairness of levies (β = 0.143) is the weakest determinant, indicating that financial governance is least effective and least trusted among actors.

These statistical results are corroborated by qualitative evidence. A market association leader noted:

'there are clear policies guiding activities related to trading, buying and supplies which are often adopted and used by the traders. He further stated that enforcement remains uneven because of limitations of institutional arrangements in Minna, Niger State. The participant asserts that although there are existing rules that are respected by many traders, problems connected to levies and charges frequently causes discontent because they are alleged as lacking transparency (KII, 2026)'.

In the same way, another participant who is a local government official argued that:

'there are proper arrangements and structures put in place to promote orderliness in markets located in Minna, but fragile means of supervision, evaluation and inadequate resources most often affects proper implementation of the entire governance processes and arrangement of the system (KII, 2026).'

These views confirm that while rules exist, enforcement is inconsistent and financial governance is contested, reinforcing the regression pattern where rule clarity dominates but enforcement and levies remain weak. These results contradict governance views that position enforcement as the primary determinant of institutional effectiveness in market systems. Classical institutional governance studies shows that weak enforcement leads directly to governance failure. However, the present result indicate the opposite pattern: rule clarity (β = 0.421) and dispute resolution (β = 0.389) outweigh enforcement (β = 0.268). This contradicts enforcement-dominant models and suggests that governance can remain functional even when enforcement is relatively weak. This aligns instead with research in informal market systems that emphasises the role of norm-based compliance and social regulation, where actors conform due to shared understanding rather than coercion. A key insight is that governance in Minna functions through a legitimacy-based compliance system, not an enforcement-based system.

The regression model explains 58.4% of variation in conflict mitigation effectiveness, specifying a moderately strong explanatory power. This suggests that conflict resolution in Minna food markets is largely structured

by institutional and social coordination mechanisms as shown in Table 3 rather than random or isolated processes. The strongest predictor is market associations intervention (β = 0.447). This indicates that a one-unit increase in the effectiveness of market associations leads to a 0.447 increase in conflict mitigation effectiveness, holding other variables constant. This makes market associations the major institutional anchor of conflict resolution, showing their dominance in maintaining order. Dialogue and negotiation (β = 0.402) are the second strongest determinant. This indicates that interpersonal communication remains a critical stabilising mechanism, supporting the role of social interaction in conflict management.

Table 3: Regression Analysis of Conflict Mitigation Effectiveness

Predictor	Beta (β)	t-value	Sig.
Market associations intervention	0.447	8.940	0.000
Dialogue and negotiation	0.402	7.585	0.000
Authority intervention	0.221	3.683	0.000
Internal conflict mechanisms	0.376	6.596	0.000

$R = 0.764$; $R^2 = 0.584$; $F = 128.44$; $p = 0.000$

Internal conflict mechanisms (β = 0.376) also show a strong effect, indicating that embedded community-based structures considerably reduce conflict escalation. Authority intervention (β = 0.221) has the weakest effect, suggesting that formal government or external authority involvement plays a limited role in resolving market disputes. These findings are strongly supported by qualitative evidence. A market leader stated:

Most conflicts among people who worked in the markets are resolved through peaceful dialogue and mediation enabled by available market association. The participant further argues that these arrangements are more operational for internal conflicts than for disputes arising from outside the market premises. The market leader clarified that conflicts connected to products pricing, products supply delays, and misunderstandings are regularly settled cordially through negotiation, which assist maintain long-term affiliations among traders in Minna, Niger State (KII, 2026).

These findings contradict governance studies that position formal state institutions as the primary actors in conflict resolution systems. Traditional governance studies assume that authority intervention is the dominant stabilising mechanism in regulated markets. However, the present findings show that market associations (β = 0.447) and dialogue (β = 0.402) are significantly stronger than authority intervention (β = 0.221). This contradicts state-centric governance models and instead supports decentralised governance perspectives. The research align more closely with research in informal economic systems, particularly within

Conflict Resolution Theory, which emphasises community-based dispute resolution rather than formal adjudication. A major insight from these findings is that conflict mitigation in Minna operates as a community-governed adaptive system rather than a state-controlled system. The regression model explains 62.7% of variation in conflict occurrence in Minna food supply chains, indicating a strong explanatory capacity. This suggests that conflict is not incidental but structurally embedded within the market system. The strongest predictor as shown in Table 4 is price fluctuations (β = 0.401), meaning that economic instability is the most powerful driver of conflict. A unit increase in price instability leads to a 0.401 increase in conflict occurrence, holding other variables constant.

Table 4: Regression Analysis of Structural Drivers of Conflict

Predictor	Beta (β)	t-value	Sig.
Weak enforcement of rules	0.356	5.836	0.000
Price fluctuations	0.401	7.426	0.000
Lack of transparency	0.318	5.390	0.000
Inadequate infrastructure	0.287	4.556	0.000
Intense competition	0.372	6.643	0.000

$R = 0.792$; $R^2 = 0.627$; $F = 151.27$; $p = 0.000$

This confirms that conflict is primarily economically induced. Intense competition (β = 0.372) is the second strongest determinant, indicating that rivalry among traders significantly escalates tension and dispute formation. Weak enforcement of rules (β = 0.356) also has a strong effect, showing that institutional weakness amplifies conflict but is not the primary cause. Lack of transparency (β = 0.318) shows a moderate effect, demonstrating that information asymmetry and distrust contribute significantly to conflict formation. Insufficient infrastructure (β = 0.287) has the weakest effect among predictors but remains significant, suggesting that logistical inefficiencies contribute to coordination breakdowns.

These statistical findings are reinforced by qualitative evidence. A market administrator stated: the qualitative evidence supports this institutional weakness, as a participant who is a market administrator selected from Tunga Market, located under Chanchaga Local Government Area, Minna opined that:

‘unfortunately, fragile enforcement of policies and lack of adequate transparency frequently led to disputes among traders. Furthering his claim, he asserts that that food price fluctuations and rivalry are the most direct causes of disputes in daily market activities. The participants stated more that discrepancies in rule implementation and financial management build ambiguity and shrink trust among supply chain actors, in that way increasing the possibility of conflicts in Minna markets (KII, 2026)’.

From an economic view, changes in price and extreme competition emerge as direct causes

of conflict within the supply chain. These factors destabilise opportunities among actors and strengthen bargaining tensions, particularly in periods of scarcity or high demand.

This is buttressed by another participant who is a farmer residing in Bosso observed that:

'Recurrent changes in food prices and extreme rivalry among traders regularly lead to discrepancies, predominantly during periods of scarcity or necessary demand of food produce, which directly impacts interactions within the supply chain in Minna, Niger State (KII, 2026)'.

From a structural viewpoint, insufficient infrastructure such as storage and transportation facilities reduce coordination efficiency and rises transaction costs within the food supply chain. This strengthens both price fluctuations and intense competition as central conflict drivers, aligning with $\beta = 0.401$ and $\beta = 0.372$ 0.372 respectively.

respectively. These views confirm that conflict is structurally and economically embedded rather than randomly generated.

These results contradict governance-focused studies that attribute market conflict primarily to weak enforcement and institutional failure. While enforcement weakness ($\beta = 0.356$) is significant, it is not the strongest driver. Instead, price

fluctuations ($\beta = 0.401$) and intense competition ($\beta = 0.372$) dominate, signifying that economic instability outweighs governance failure in explaining conflict. This contradicts purely institutional explanations of market instability and aligns

more closely with structural theories in Political Economy, which emphasizes economic forces as primary drivers of social tension. A primary insight is that conflict inMinna food supply chains is structurally produced rather than institutionally generated alone.

Discussion of Findings

The regression results show that market governance in Minna is significantly shaped by institutional clarity and informal coordination mechanisms, though the magnitude of

influence varies across predictors. Rule clarity ($\beta = 0.421$, $p < 0.001$) emerges as the strongest determinant, indicating that governance effectiveness is mainly anchored on the availability and intelligibility of operational rules. This means that actors respond more to predictable institutional guidance than to coercive enforcement. Dispute resolution mechanisms ($\beta = 0.389$, $p < 0.001$) also exert a strong effect, reinforcing the centrality of informal mediation structures in sustaining market order. Enforcement of regulations ($\beta = 0.268$, $p < 0.001$) indicates moderate influence, implying that while enforcement exists, it is not the dominant stabilising force. Fairness of levies ($\beta = 0.143$, $p = 0.010$) records the weakest effect, reflecting persistent distrust in financial governance structures. This finding contradicts the position of North (1990), influenced institutional enforcement models, which argue that coercive enforcement is the primary driver of governance effectiveness. Instead, the result aligns more closely with

Ostrom's (1990) theory of collective action, which emphasises shared norms and participatory rule systems. However, the current study extends this literature by demonstrating that even dispute resolution mechanisms can outperform formal enforcement in fragile markets. A novel insight

from this result is that governance in Minna operates as a hybrid legitimacy system, where rule clarity and informal mediation substitute for weak enforcement. This indicates a shift from coercion-based governance to norm-driven stability.

The regression analysis shows that conflict mitigation in Minna food supply chains is predominantly sustained by informal institutional arrangements. Market association intervention ($\beta = 0.447$, $p < 0.001$) is the strongest predictor, followed by dialogue and negotiation ($\beta = 0.402$, $p < 0.001$). Internal conflict mechanisms ($\beta = 0.376$, $p < 0.001$) also demonstrate strong explanatory power, while authority intervention ($\beta = 0.221$, $p < 0.001$) has the weakest effect. This pattern indicates a clear dominance of informal governance structures over formal institutions in conflict resolution.

The results contradict Olson's (1965) collective action logic, which assumes stronger outcomes under formal enforcement structures. Instead, they support but also extend Alderman and Paxson's (2017) assertion that informal institutions dominate food system coordination in developing economies. However, this research introduces a critical departure: informal mechanisms are effective but boundary-constrained, functioning well for internal disputes but weakening under externally induced shocks such as transport disruptions or insecurity. This shows a structural limitation not fully addressed in existing literature. A key novel insight is that conflict resolution in Minna operates as a community-regulated feedback system, where stability is maintained through social proximity rather than institutional authority. However, this system is not fully adaptive, demonstrating limited resilience rather than systemic robustness.

The findings indicate that conflict in food supply chains is structurally and economically embedded rather than purely institutionally generated. Price fluctuations ($\beta = 0.401$, $p < 0.001$) represent the strongest driver of conflict, followed by intense competition ($\beta = 0.372$, $p < 0.001$) and weak enforcement of rules ($\beta = 0.356$, $p < 0.001$). Lack of transparency ($\beta = 0.318$, $p < 0.001$) and inadequate infrastructure ($\beta = 0.287$, $p < 0.001$) also significantly contribute. These findings challenge governance-centric explanations such as those advanced by World Bank institutional fragility frameworks, which prioritize institutional weakness as the primary cause of market conflict. Instead, the current results show that economic volatility-particularly price instability-has a stronger explanatory role than governance failure alone. The findings align more closely with structural conflict theory (Coser, 1956), which emphasizes competition over scarce resources as a driver of conflict. However, the present study advances this perspective by demonstrating that economic and institutional factors operate in a reinforcing feedback loop, where governance weakness amplifies price volatility and competition intensifies institutional strain. A key novel view is that conflict in Minna's food supply chains is systemically produced, not individually generated. It emerges from the interaction of economic instability, governance weakness, and infrastructural deficits, forming a self-reinforcing conflict cycle.

CONCLUSION

This research examined governance structures and conflict mitigation strategies in food supply chains in Minna, Niger State, using a systems theory perspective. The study establishes that food supply chains operate as interconnected systems where governance processes, actor interactions, and structural conditions jointly shape stability and conflict outcomes. As such, governance effectiveness is largely driven by institutional clarity and informal coordination rather than strict enforcement, showing a hybrid governance arrangement in which legitimacy and social coordination play a stronger role than coercive control.

The study concludes that conflict mitigation is primarily sustained through market associations and dialogue-based mechanisms, which function as the most effective stabilising forces within the system. However, these mechanisms are mainly effective for internal disputes but less capable of addressing external disruptions, revealing a boundary-limited adaptive capacity within the system. Conflict generation, on the other hand, is strongly influenced by economic and structural pressures, predominantly price instability, competition, and infrastructural constraints, which interact with governance weaknesses to intensify instability.

Theoretically, the work advances systems theory by indicating that adaptation in food supply chains is uneven and asymmetrical, with informal institutions playing a more dominant stabilising role than formal governance structures. Empirically, it provides regression-based evidence that conflict and governance outcomes are shaped more by informal coordination and economic volatility than enforcement mechanisms alone. Policy-wise, the research recommends strengthening transparency in market governance, formally integrating market associations into dispute resolution frameworks, and addressing structural constraints such as price instability and infrastructure deficits through targeted interventions.

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