GROUND RADAR TECHNOLOGY AND SECURITY SURVEILLANCE OF FARMER NOMADIC PASTORALISTS' CONFLICT IN NIGERIA

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DECLARATION

I hereby declare that this thesis has been written by me and it is a report of my research work. It has not been presented in any previous application for Doctor of Philosophy (PhD). All quotations are indicated and source of information specifically acknowledged by means of references.

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CERTIFICATION

This thesis entitled "**Ground Radar Technology and Security Surveillance of Farmer Nomadic Pastoralists Conflict in Nigeria**." by EBUTE, Joel Ugbede'ojo, meet the requirement governing the award of Doctor of Philosophy Degree (PhD), of the school of Postgraduate Studies, Nasarawa State University, Keffi, and is approved for its contribution to Knowledge.

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DEDICATION

This research work is dedicated to the almighty God for his mercies on our lives and to all who have contributed in one way or the other to the success of this Research.

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ABSTRACT

This study examined the potency of ground radar technology in security surveillance of farmer-nomadic pastoralists' conflict in Nigeria. Six specific research objectives were formulated to guide the study. The research design was exploratory research design. 72 respondents, made up of heads of operation and two assistants and heads of administration and two assistants were selected using experiential sampling technique from six security outfit involved in internal security operation in three states. The instrument known as "Ground Radar Technology and Security Surveillance of farmer-nomadic pastoralist conflict Questionnaire (GRTSSFNPCQ)" was used to collect the data. The instrument (GRTSSFNPCQ) was subjected to reliability test, using test-retest method and it produced high reliability coefficient of 0.78 to justify the use of the instrument. The findings revealed that there is no significant availability of ground radar technology deployed for farmer-nomadic pastoralists conflict in Nigeria. The result also revealed that Ground Radar Technology can significantly facilitate Intelligence Gathering, Real-time Surveillance and Interception, Secure Communication among Law Enforcement Agencies and affects the application of Identity Establishment and Verification of Farmer - Nomadic Pastoralists conflict in Nigeria. Hence, the study recommended among others that the government should endeavor to adopt and install Ground Radar Technology adequately to monitor, minimize or completely stop the issues Farmer-Nomadic- Pastoralists conflict in Nigeria.

CHAPTER ONE

INTRODUCTION

1.1 Background to the Study

It is obvious that rural farmers and livestock breeders are the primary sources of the food in Africa, particularly for the urban areas of most countries including Nigeria. Of recent, livestock breeders particularly Transhumant Pastoralist and sedentary/migrant farmers have engaged each other in an internecine warfare that is threatening the peace and stability of our country. Williams (2005) noticed that the conflict had been primarily about resource use, damage to crops, blocking of transhumant corridors, farming along the valleys and stream/river banks and uncomplimentary agricultural policies by government. However, of recent, the conflict has assumed a dangerous dimension with the infusion of ethnic, religious and political factors into it. Cattle rustling, availability of dangerous weapons, intra-pastoralist conflicts, mercenary elements and dangerous drugs has all added to the combustion.

Abdu (2010) stated that over the past three years, north central Nigeria has been experiencing a lingering conflict between herdsmen and crop-farmers. While the crop farmers accused the herdsmen of destruction of their crops and contamination of community water points while the herdsmen accuse the crop farmers of denying them access to grazing areas and occasionally rustling their cattle. The cause for concern is the

invasion of vast areas in the region by armed mercenaries under the cover of herdsmen, leading to the desolation of rural villages and displacement of rural dwellers in several areas as well as heightening insecurity. These conflict in North-Central Nigeria are Benue, Plateau, Nasarawa, Southern Kaduna and Taraba States where the intensity is much felt. The attendant consequences of these clashes are better imagined than described in communities where they occurred. Ayih (2003) Gyuse & Ajene (2006), argued that these conflicts have become pervasive to the extent that virtually every area in North-Central has unresolved conflict at various stages of escalation or de-escalation.

Ground radar technology can play a critical role in strengthening Nigeria's National security against potential future attacks. Specifically, it enables the local government, state government, the nation at large and its security apparatus to identify potential threats, share information more readily, provide mechanisms to protect the nation, and develop response capabilities. Ground radar technology is a Surveillance system that has the capabilities to monitor most sensitive equipment's and public places.

The word Surveillance is applied to monitoring from a distance by means of digital device such as high-definition weather proof CCTV cameras, or interception of electronically transmitted information such as internet traffic or phone calls**.** According to Kathori (2004),

surveillance is the system for collection, analysis, interpretation and dissemination of data and information on an ongoing basis. It is also a mechanical or electronic system or device that enables continuous or periodic video recording, observation or monitoring of an individual or group.

Cerezo (2013) asserted that the benefits of security surveillance by Ground Radar Technology to monitor farmer-nomadic pastoralists conflict zones in Nigeria are numerous. In a way, it is expected that the security system provides a surreptitious or secret monitoring of people's activities. It is also factual that globally, Ground Radar Technology provides an unimpeded real-time monitoring and report to the federal law enforcement agencies and other governmental organizations. Provision of quick and prompt response by the system is also sure when there is a security breach or problem. It has also become a fact that the system makes the location and tracking of law fugitives easier. It is true that there have been positive implications of Ground Radar Technology across the globe. It is true that the surveillance ensures a more secured and safer environment conducive for meaningful, socio-economic development, safety of lives and property (Daniels, 2004).

The recent security challenges in Nigeria have accentuated the deep schism in the polity and the conflicts in some of our neighbouring countries have led to the availability of illegal and sophisticated

weapons. To adequately address Nigerian security challenges, modern intelligence gathering devices such as Ground Radar Technology must be acquired and deployed by security services, deliberate and conscious efforts must be put in place so that socio economic activities can prosper. This research therefore addresses the role of ground radar technology in security surveillance of farmer–nomadic pastoralists from the perspective of unimpeded intelligence gathering, real-time surreptitious surveillance and interception, secure communication among law enforcement agencies and identity establishment and verification of Farmer-Nomadic Pastoralist in conflict zones in Nigeria.

1.2 Statement of the Problem

Insecurity is a primary area of concern in most parts of Nigeria for more than a decade. A large percentage of the population Nigeria has fallen victims of the insecurity situations. The most affected of all are the nomadic pastoralists and the farmers in the north central parts of Nigeria. The insecurity issue proves unsafe for Nigeria to grow economically. However, it is vital to note that several methods have been put in place to combat the problem of insecurity in Nigeria, such the clash between farmers and the nomadic pastoralists. Perhaps the most famous one being the ground radar technology in security surveillance of farmer–nomadic pastoralists in conflict in Nigeria. The other proposed solutions seem not to work, but the surveillance system

is proving a significant option. Technology has come to stay, though expensive it has been tested across the globe. Nigeria will sink into trouble if adequate measures are not put in place. Ground radar technology in security surveillance from the perception of unimpeded intelligence gathering, real-time surveillance and interception, secure communication and identity establishment and verification is a solution that can play a critical role in strengthening Nigeria's national security against potential future attack.

1.3 Research Questions

The following research questions will be answered:

i. Is Ground Radar Technology Equipment available in farmer –nomadic pastoralists conflict in Nigeria?

ii. To what extent will Ground Radar Technology facilitate Intelligence gathering of farmer - nomadic pastoralists conflict in Nigeria?

iii. How will Ground Radar Technology assist in Real-time Surveillance and Interception of farmer - nomadic pastoralists conflict in Nigeria?

iv. What are the effects of using Ground Radar Technology to Secure Communication among law enforcement agencies in farmer - nomadic pastoralists conflict in Nigeria?

v. To what extent will the application of Ground Radar Technology assist in identity establishment and verification of farmer - nomadic pastoralists conflict in Nigeria?

vi. What are the challenges of using Ground Radar Technology in security surveillance of farmer-nomadic pastoralists conflict in Nigeria?

1.4 Objectives of the Study

The main objective of this study is to examine the roles of Ground Radar Technology with respect to security surveillance of farmer-nomadic pastoralist in conflict zones in Nigeria. The specific objectives of the study are as follows:

i. To find out if Ground Radar Technology equipment are adequately available in number in farmer nomadic pastoralist conflict zones in Nigeria.

ii. To examine the extent to which Ground Radar Technology facilitate in unimpeded Intelligence gathering of farmer-nomadic pastoralist in conflict zones in Nigeria.

iii. To determine how Ground Radar Technology assist Real-time surreptitious Surveillance and Interception of farmer-nomadic pastoralist in conflict zones in Nigeria.

iv. To examine the effects of using Ground Radar Technology to Secure Communication among law enforcement agencies in farmer-nomadic pastoralist conflict zones in Nigeria.

v. To examine the extent to which the application of Ground Radar Technology assist in Identity establishment and verification of farmer-nomadic pastoralist in conflict zones in Nigeria.

vi. To examine the challenges of using Ground Radar Technology in security surveillance of farmer-nomadic pastoralist in conflict zones in Nigeria.

1.5 Statement of Hypotheses

The following hypotheses where be tested:

Ho_1 Ground Radar Technology are not adequately available in number in farmer-nomadic pastoralist conflict zones in Nigeria.

Ho_2 Ground Radar Technology do not significantly facilitate unimpeded Intelligence gathering of farmer - nomadic pastoralist in conflict zones in Nigeria.

Ho_3 Ground Radar Technology do not significantly assist Real-time Surveillance and Interception of farmer - nomadic pastoralist in conflict zones in Nigeria.

Ho_4 Ground Radar Technology do not significantly affect Secure Communication among law enforcement agencies of farmer-nomadic pastoralist in conflict zones in Nigeria.

Ho_6 Ground Radar Technology do not significantly affect the application of Identity establishment and verification of Farmer-Nomadic Pastoralist in conflict zones in Nigeria.

Ho_7 Ground Radar Technology do not significantly have challenges in security surveillance of Farmer-Nomadic Pastoralist in conflict zones in Nigeria.

1.6 Significance of the Study

This research work is of great importance to the armoury of military forces and security services in their battle to fight crime and to manage community clashes more effectively. It will assist them in intelligence gathering, real-time monitoring, secure communication, identity establishment and verification of farmer - nomadic pastoralist in conflict zones in Nigeria.

The result of this research will be beneficial to the government as they will see the need to use ground radar technology for security surveillance of farmer-nomadic pastoralist in conflict zone in Nigeria thereby, deploying military troops when necessary.

The result of this research will be beneficial to communities of farmer - nomadic pastoralist, in a way that, ground round radar technology will manage conflicts in such communities to create a safer environment for the citizens.

Furthermore, this research will be of value to the policy makers and regulators such that they will gain insight on extent of the conflict in the zones. Effective security surveillance tool will help stop or minimize the problem of insecurity in such areas. This will influence policy makers formulating informed policies concerning the overall security of the country Nigeria.

This research will also provide basis for reference in future research. The scholars, researchers, students, security services will find this study valuable as they will gain knowledge and carry out further studies on the roles of ground radar technology in security surveillance of farmer-nomadic pastoralist in conflict zones in Nigeria.

1.7 Scope of the Study

The research area is Plateau, Benue and Taraba State. The study is centered on Ground Radar Technology in security surveillance of farmer-nomadic pastoralist in conflict zones in Nigeria from 2009 to 2019. The period under review is relevant in view of the increased frequency of attacks attributed farmer-nomadic pastoralist in conflict zones in Nigeria. The research examines the roles of Ground Radar Technology in Security Surveillance with regard to effectiveness in unimpeded Intelligence gathering, Real-time surreptitious Surveillance and Interception, Secure communication among law enforcement agencies, and Identity establishment and verification on farmer - nomadic pastoralist in conflict zones in Nigeria.

1.8 Operational Definition of Terms

These terms are defined according to the context of this study:

Ground Radar technology: Ground radar technology is a Surveillance system that has the capabilities to monitor most sensitive equipment's and

public places. In this study, ground radar technology is conceptualized or can be referred to as ground surveillance radar.

Farmer - Nomadic pastoralists' conflict: This refers to the conflict that exist between pastoral farmers and crop farmers that often leads to destruction of lives and property in various communities.

Security Surveillance: Security Surveillance involves the use of ground radar technology to combat farmer - nomadic pastoralist conflict. From the perception of effectiveness in unimpeded Intelligence gathering, Real-time surreptitious Surveillance and Interception, Secure Communication among law enforcement agencies, and Identity establishment and verification of former - nomadic pastoralists conflict zones in Nigeria.

CHAPTER TWO
LITERATURE REVIEW

2.1 CONCEPTUAL FRAMEWORK

2.1.1 The Concept of Ground Radar Technology

Varadarajan (2013), noted that Ground Radar Technology has inbuilt electronic sensors that play a vital part in enabling Armed Forces and security agencies to gather information or intelligence about the enemy. Ground Radar Technology is an Electro Magnetic (EM) sensor system used for detection, location tracking, imaging and classification of targets such as man-made objects like aircraft, ships, ground moving vehicles and natural environment including ground features and moving men. It is an important sensor for the commanders' battle space awareness. Modern battles and crime fighting has transformed into network centric with unified battlefields spread across multi theatres of operation. With the advent of microelectronics, Radio Frequency (RF) management and unprecedented growth in processing power and computation, Ground Radar Technology or ground surveillance radar has transformed into a complex, advanced and intelligent sensor.

Ground Surveillance Radar Technology has a sophisticated in-built software to detect, track and classify targets like crawling man, single walking man, group of walking men, moving jeep-size vehicle, and

moving heavy vehicles at various distances. It comprises an in-built interface for automatic transfer of target data and Doppler audio to remote locations, integrated image sensors to enhance the ability to identify and classify the targets. The entire system can be carried by three soldiers and is tripod mounted while in operation. An infantry soldier can install the radar and bring it into operation, within 5 min. This radar is a potential ground-based e-sensor for Border Security Force, Coast Guard and Police, for surveillance of designated areas, such as farmer – nomadic pastoralist conflict zones and can be configured as an effective perimeter sensor for domestic and military airports, large industrial establishments, or other infrastructures.

Similarly, Ground Radar Technology is a technology that uses pulses of electromagnetic radiation to penetrate the surface of the ground, and go below to reveal any anomalies in soil or other materials. Ground Radar Technology uses microwave band frequencies, generally from 10 MHz to 1 GHz. According to Daniels (2004), Ground Radar Technology (GRT) is a geophysical method that uses radar pulses to image the subsurface. This nondestructive method uses electromagnetic radiation in the microwave band (UHF/VHF frequencies) of the radio spectrum, and detects the reflected signals from subsurface structures. GRT can have applications in a variety of media, including rock, soil, ice, fresh water, pavements and structures. In the right conditions, practitioners

can use GRT to detect subsurface objects, changes in material properties, and voids and cracks.

Equally, Ground radar is a radar positioned on the ground and used for air defense examples include; ground-controlled interception, command guidance, air traffic control, instrument landing systems, radar bomb scoring, etc. Ground Radar Technology (GRT) uses a high frequency radio signal that is transmitted into the ground and reflected signals are returned to the receiver and stored on digital media. The computer measures the time taken for a pulse to travel to and from the target which indicates its depth and location. The reflected signals are interpreted by the system and displayed on the unit's LCD panel. According to Kelly & Carol (2008) shallow subsurface hydrogeological survey is vital in various fields of studies. Near-surface underground water is an essential resource that is playing a vital role in supporting life. Studies on spatial variability of hydrogeological properties of shallow soil are therefore, very essential in fields such as agriculture, construction engineering, environmental studies.

David (2000) asserted that the performance of a radar system can be judged by the following: (1) the maximum range at which it can see a target of a specified size, (2) the accuracy of its measurement of target location in range and angle, (3) its ability to distinguish one target from another, (4) its ability to detect the desired target echo when masked by

large clutter echoes, unintentional interfering signals from other "friendly" transmitters, or intentional radiation from hostile jamming (if a military radar), (5) its ability to recognize the type of target, and (6) its availability (ability to operate when needed), reliability, and maintainability. Some of the major factors and challenges that affect performance of ground radar technology are:

Atmospheric effects

Rain and other forms of precipitation can cause echo signals that mask the desired target echoes. There are other atmospheric phenomena that can affect radar performance as well. The decrease in density of the Earth's atmosphere with increasing altitude causes radar waves to bend as they propagate through the atmosphere. This usually increases the detection range at low angles to a slight extent. The atmosphere can form "ducts" that trap and guide radar energy around the curvature of the Earth and allow detection at ranges beyond the normal horizon. Ducting over water is more likely to occur in tropical climates than in colder regions. Ducts can sometimes extend the range of airborne radar, but on other occasions they may cause the radar energy to be diverted and not illuminate regions below the ducts. This results in the formation of radar holes in the coverage. Ghahramani (2002) asserts that since it is not predictable or reliable, ducting can in some instances be more of a nuisance than a help.

Interference

Signals from nearby radars and other transmitters can be strong enough to enter a radar receiver and produce spurious responses. Well-trained operators are not often deceived by interference, though they may find it a nuisance. Interference is not as easily ignored by automatic detection and tracking systems, however, some method is usually needed to recognize and remove interference pulses before they enter the automatic detector and tracker of radar (Skolnik, 2001).

Turesson (2006) described the advantage of GRT over other methods of soil water surveys as its vertical and lateral resolutions in high resistivity environment. GRT records continuous graphic profiles of the subsurface interfaces with high degree of accuracy. In order to find the location and depth of an object, buried subsurface, various types of GRT equipment are used to collect the data. The type of GRT equipment required is dependent on the depth and size of the target to be located. The radar unit emits and receives reflected signals up to a thousand times per second. These signals are viewed by the field operator on location immediate analysis and are also stored in the system and downloaded to a computer for further data analysis if required. To locate objects such as rebar, conduits and post-tension cables imbedded in concrete a high frequency GRT system is used. The data can be collected in simple line scans to determine the thickness of concrete or in a grid format which

will produce a map of any targets located in the concrete. Using this method one can look at virtual slices in the image to determine the depth of the objects and create a 3D map of the image.

Forms of Ground Radar Technology

Battlefield Surveillance Radar–Short Range

Varadarajan (2013) made clear that, Battlefield Surveillance Radar–Short Range (BFSR-SR) is a lightweight, man portable, user-friendly surveillance electronic sensor developed for the Indian Army. The radar is capable of searching a specified sector and performing track-while-scan (TWS) for multiple ground surface targets to provide all-weather surveillance against intrusion. BFSR is a fully coherent pulse Doppler radar. Thelow peak power provides the radar a low probability of intercept (LPI), making it difficult to intercept by enemy sensors. The radar algorithm incorporates Digital Pulse Compression Technology, which improves the LPI characteristics, provides adaptive RF power management based on the depth of surveillance, as well as making the radar capable of resolving closely spaced targets. The radar operates in all-weather conditions and during day and night.

Micro air vehicle with attached surveillance camera

Aerial surveillance is the gathering of surveillance, usually visual imagery or video, from an airborne vehicle-such as an unmanned aerial vehicle, helicopter, or spy plane. Military surveillance aircraft use a

range of sensors (e.g. radar) to monitor the battlefield (Kelly and Carol, 2008). Digital imaging technology, miniaturized computers, and numerous other technological advances over the past decade have contributed to rapid advances in aerial surveillance hardware such as micro-aerial vehicles, forward-looking infrared, and high-resolution imagery capable of identifying objects at extremely long distances. For instance, the MQ-9 Reaper Arena. Gross and Grant (2008) assert that a U.S. drone plane used for domestic operations by the Department of Homeland Security, carries cameras that are capable of identifying an object the size of a milk carton from altitudes of 60,000 feet, and has forward-looking infrared devices that can detect the heat from a human body at distances of up to 60 *kilometers*. In an earlier instance of commercial aerial surveillance, the Killington Mountain ski resort hired 'eye in the sky' aerial photography of its competitors' parking lots to judge the success of its marketing initiatives as it developed starting in the 1950s (Wired Magazine, 2004).

Ground Surveillance using Drone

SkyWall100 is a handheld system that gives a mobile operator the ability to physically capture a drone in a specifically designed ‘drone entangling’ net. It uses compressed air to launch a projectile up to the drone after the operator has targeted it using the onboard Smart-Scope. SkyWall100 can be used as a standalone drone defense system but can

also be integrated with a wider security system, using the skylink module, to offer a highly capable counter drone package. The United Kingdom, as well, is working on plans to build up a fleet of surveillance UAVs ranging from micro-aerial vehicles to full-size drones, to be used by police forces throughout the U.K (Dotinga, 2004). The United States Department of Homeland Security is in the process of testing UAVs to patrol the skies over the United States for the purposes of critical infrastructure protection, border patrol, "transit monitoring", and general surveillance of the U.S. population (Mack and Kelly, 2009). In addition to their surveillance capabilities, MAVs are capable of carrying tasers for "crowd control", or weapons for killing enemy combatants (Boyd, 2016). Programs such as the Heterogeneous Aerial Reconnaissance Team program developed by DARPA have automated much of the aerial surveillance process. They have developed systems consisting of large teams drone planes that pilot themselves, automatically decide who is "suspicious" and how to go about monitoring them, coordinate their activities with other drones nearby, and notify human operators if something suspicious is occurring, (Phil, 2009). This greatly increases the amount of area that can be continuously monitored, while reducing the number of human operators required. Thus a swarm of automated, self-directing drones can automatically patrol a city and track suspicious individuals, reporting their activities back to a centralized monitoring

station (Friedersdorf and Conor, 2016). In addition, researchers also investigate possibilities of autonomous surveillance by large groups of micro aerial vehicles stabilized by decentralized bio-inspired swarming rules (Warwick and Graham, 2007).

Underground Assistance

Antenna frequency is one of the major factors in radar penetration. The higher the frequency of the antenna, the more shallows into the ground the signal will penetrate and the easier it will be to resolve the targets. Conversely, the lower the antenna frequency, the deeper the signal will penetrate and the more difficult it will be to resolve the targets. Antenna choice is one of the most important factors in survey design. For utility locating applications, the 400 and 900 MHz antennas will be cover almost all potential situations. During the scan, reflections are produced whenever the energy pulse enters into a material with different electrical conductivity or dielectric permittivity from the material it just left. The strength, or amplitude, of the reflection is determined by the contrast in the dielectric constants and conductivities of the two materials. This means that a pulse which moves from dry sand (dielectric of 5) to wet sand (dielectric of 30) will produce a very strong reflection, while moving from dry sand to limestone will produce a relatively weak reflection. The rate of signal attenuation varies widely and is dependent on the properties of the material that the

pulse is passing through. Materials with a high dielectric value slow the radar wave and decrease its penetration depth, and highly conductive materials attenuate the signal rapidly. For example, water dramatically raises the dielectric of a material, thereby inhibiting signal penetration; and highly conductive materials such as metals completely reflect the signal. Radar energy is emitted from the antenna in a cone shape, and the two-way travel time for energy at the leading edge of the cone is longer than for energy directly beneath the antenna. To understand how this translates into a data image, imagine scanning perpendicularly across a pipe. Because it will take longer for energy at the leading edge of the cone to be captured, when the antenna first approaches the pipe, it will appear down low in the data screen profile.

The GSSI utility scan module

The Utility Scan module consists of the GSSI SIR-3000 control unit and a survey cart with an integrated survey wheel encoder attached to a either a 400 or 900 MHz antenna. This technology enables one to collect data in real-time, accurately pinpoint the location and depth of buried objects with a back-up and cross-hair cursor, it easy to transport, and it can withstand the toughest conditions.

GRT waves travel through many different materials. Different types of soil, concrete, fill material, debris, and varying amounts of water saturation all have different dielectric and conductive properties that

affect the GRT waves, and thus GRT data interpretation. Although the data images are displayed on the screen they still require someone with field experience to interpret them in order to accurately determine the findings. This is probably one of the most commonly asked questions. In most cases an estimated depth range can be determined with accuracy based upon the subsurface material and the frequency of the GRT antenna. For applications requiring higher resolution, such as locating rebar or conduits in concrete, a higher frequency GRT system (1,000 MHz) is used. This will give high-resolution detail for down to approximately 24 inches in depth. Applications, which require deeper penetration in ground soil requires a lower frequency (12.5 MHz to 500 MHz). Depending on the subsurface material the depth, range can be from a few inches to thousands of feet. It is useful and important to understand the basic theory involved in GRT data collection and analysis to enhance the decision-making process for acquiring GRT services or procuring and implementing a dedicated GRT system.

2.1.2 The Concept of Security Surveillance

Surveillance is the monitoring of behavior, activities, or other changing information for the purpose of influencing, managing, directing, or protecting people (Leighton & Martin, 2014). This can include observation from a distance by means of electronic equipment (such as closed-circuit television (CCTV) cameras) or interception of

electronically transmitted information (such as Internet traffic or phone calls). It can also include simple no- or relatively low-technology methods such as human intelligence agents and postal interception.

The word surveillance comes from a French phrase for "watching over" (sur means "from above" and veiller means "to watch") and is in contrast to more recent developments such as sousveillance (Clarke, 1988). Surveillance is used by governments for intelligence gathering, prevention of crime, the protection of a process, person, group or object, or the investigation of crime. It is also used by criminal organisations to plan and commit crimes, such as robbery and kidnapping, by businesses to gather intelligence, and by private investigators.

Surveillance can be viewed as a violation of privacy, and as such is often opposed by various civil liberties groups and activists. Liberal democracies have laws which restrict domestic government and private use of surveillance, usually limiting it to circumstances where public safety is at risk. Authoritarian government seldom have any domestic restrictions, and international espionage is common among all types of countries (Marx, 2015). Surveillance techniques are not created equal; among the many biometric identification technologies, for instance, face recognition requires the least cooperation. Unlike automatic fingerprint reading, which requires an individual to press a finger against a

machine, this technique is subtle and requires little to no consent (Philip, 2003).

Over the past twenty years, the concepts of security and surveillance have undergone multiple and often contrasting reformulations. Shifting from an emphasis on territorial integrity and national sovereignty to a new focus on human security and development and, after 9/11, back again to a new concept of statehood based on homeland security and war on terror supported by new ways of surveillance technologically oriented (Vincenzo and Elviara, 2014).

In this new approach to security and surveillance, the priority seem to have been reassigned to territorial integrity, yet with a new emphasis on pre-emptive action, anticipation of threats and risk management. In this controversial trajectory, the roles played by the shifting nature of global security threats and the national reactions to terrorism and transnational organize crime have been largely studied. Yet, little work has been done on the role played by the massive and often indiscriminate development and deployment of surveillance-oriented security technologies and their consequences for our democracies. In fact, there seems to exist a mutually constitutive relationship by current concepts of statehood, pre-emptive security and surveillance-oriented security technologies.

Through discourse and frame analysis of the most recent EU and national security strategy documents, we show how security is an expanding concept related to pre-emptive actions and threat anticipation to be achieved by the use of new controversial surveillance technologies. In this new context, monitored citizens, thus, are asked to renounce to part of their liberty in exchange for an increased level of security. However, if citizens cannot be free unless they are safe, they also cannot be safe unless they are free, or they would no longer be citizens (Vincenzo and Elviara, 2014).

According to James, Witten, Hastie and Tibshirani (2013), the implementation of any comprehensive security policy usually involves a multi-layered approach with the first line of defense being the surrounding community perimeter. There have recently been a number of highly publicized incidents at communities, which were initiated as a result of a perimeter security breach – both inadvertently and deliberately. The current sophisticated solutions for effective perimeter security detection include, amongst others, long-range, thermal-imaging surveillance cameras, false alarm resilient presence and motion-detection sensors, as well as ground-radar detection and tracking. Once deployed, these external detection systems can be operated through intelligent management platforms to automatically qualify and identify unauthorized attempted access well beyond the conflict zones and

contain a potential risk before it poses a threat to life and loss of properties.

The benefits associated with the live tracking of qualified objects, vehicles and people via video analytics can assist security operators to effectively manage all ground activity in a typically busy and dynamic environment. All movement and activity is automatically mapped against planned and authorized routes with real time integration of databases. This facilitates security operatives to be alerted and react to extraordinary events and suspicious behavior aided by pre-defined and approved workflows. Today's large-scale surveillance solutions filter critical events from camera and other sensor input, graphically displaying results via a comprehensive digital map on a single screen. Integrated three-dimensional analytics determine particular object attributes, supporting operators in pre-qualified classification of all activity and incidents. Using intelligent policy zones and virtual barriers, these systems detect, track, and classify activity, enabling operators to see what is happening throughout the whole area in real time (James, Witten, Hastie and Tibshirani, 2013).

Retaining the allocation of weather radar frequencies, particularly at S-band wavelengths with their relatively small attenuation in heavy rainfall, is critically important to maintaining the operational integrity of

the NEXRAD radar system as well as preserving its capabilities for any future replacement system. Furthermore, an important advancement in the replacement system should be realization of more rapid volumetric sampling rate. This will most likely require use of radar waveforms that employ wider bandwidth than the current NEXRAD system. These frequency allocations are continuously being scrutinized for possible real-location to other sectors of society to meet increasing spectrum demands for communications and entertainment applications. The issue is international in scope, since many spectral-use applications extend beyond national borders. Regarding the latter, the International Telecommunications Union sponsors the World Radio Committee (WRC) meeting in Geneva every two years to discuss and decide on spectrum allocation issues. Thus, in addition to preserving these national allocations, U.S. representatives to the WRC meeting must constantly remain alert in order to preserve the global weather radar spectrum allocations (McGinnis, 2001). The importance and value of weather radar to society has been aptly demonstrated with the NEXRAD system, especially through its utility for providing critical warning of severe weather, monitoring precipitation, and helping ensure safe and efficient operation of the National Airspace System (NAS).

2.1.3 Farmer

According to Wendell (2013), farmer can be defined as someone who grows plants and raises animals for human use, work very hard and long hours in order to be successful. The work of farmers is essential for human survival. In a similar vein, a farmer is someone who works under the umbrella of agriculture, producing a variety of food products for human and animal consumption.

Berry, (2013) opined that, there are several kinds of farmers ranging from farmers who raise animals to farmers who grow crops. Wendell (2013), argued that, "Farmers farm for the love of farming. They love to watch and nurture the growth of plants. They love to live in the presence of animals. They love to work outdoors. They love the weather, maybe even when it is making them miserable." A farmer's main goal is to produce a good crop and/or healthy animals in order to make a living and to feed the population. Farmers are responsible for all crops and livestock that are needed for us to survive. Without food, the world would slowly die, and farmers work hard every day to keep plenty of crops and animal products in the market to prevent that from happening. He outlined the various types of farmers such: Organic Farmer - produces fruits, vegetables, grains, or livestock without the use of pesticides, herbicides, or chemical fertilizers. Grain and Forage Crop Farmer - grows grains such as wheat, barley, canola, oats, rye, flax, peas

and speciality crops or forage crops. Dairy Farmer- owns or manages a farm where cows are raised for the production of milk and other dairy products. Poultry Farmer - raises domesticated birds such as geese, ducks, turkeys or chickens. Rancher - raises livestock such as cattle or sheep, or less common livestock such as elk, bison, ostrich, emu or alpacas. Beekeeper - keeps honey bees, and produces honey, pollen, royal jelly and beeswax. Vermiculturist - breeds worms and uses the worms to convert waste products such as uneaten food, feces, grass clippings, and spoiled fruit and vegetables into healthy, nutrient-rich soil and organic fertilizer. Alligator Farmer- breeds and raises alligators.

2.1.4 Nomadic Pastoralist

According to Blench (2001), Nomadic Pastoralism is a form of pastoralism where livestock are herded in order to find fresh pastures on which to graze. Strictly speaking, true nomads follow an irregular pattern of movement, in contrast with transhumance where seasonal pastures are fixed. However this distinction is often not observed and the term nomad used for both in historical cases the regularity of movements is often unknown in any case. In the early days, research was all about establishing typologies.

The herded livestock include cattle, yaks, sheep, goats, reindeer, horses, donkeys or camels, or mixtures of species.

Nomadic pastoralism is commonly practised in regions with little arable land, typically in the developing world (Zarins and Juris, 1992). Pastoralists raise different types of livestock. The characteristics of the animals and local environmental conditions determine the number and composition of the herds (Ahmed, 2009). Pastoral production systems are by large, a product of climatic and environmental factors. The objective of the pastoralist is to accumulate and maintain as much wealth as possible in terms of livestock. Pastoralists have been able to carve out a living from the harsh and unpredictable environment for centuries. In their long history, livestock provided not only a valuable source of food, but also acted as a reserve of wealth, a redeemer from damage, a sacrificial gift, and a means of marriage and other ceremonial payments (Barrett, Brandon, Gibson and Gjertsen, 2001). So also in the study of nomadic pastoralism, which was concerned with establishing typologies of "pure pastoralists or nomads" where the units of analysis were "ideal types" (Dyson-Hudson, 1972).

Pastoral and nomadic societies were classified according to how much of the "ideal types" they contained. Not surprisingly, the concept of "pure pastoralists or nomads" is fictional; rather, nomadic pastoralism as an adaptation is characterized by variations. The Norwegian anthropologist Fredrik (1966) argued that we have to look for processes that produce social forms by seeing a society as patterns of human

behaviour. Following this line of thought, Dyson-Hudson and Dyson-Hudson (1980) conceptualizes nomadic pastoralism as the coexistence of dependence on livestock with spatial mobility. The herded livestock include cattle, yaks, sheep, goats, reindeer, horses, donkeys or camels, or mixtures of species. Nomadic pastoralism is commonly practised in regions with little arable land, typically in the developing world (Pollard, Rosenberg, and Tignor, Elizabeth, Clifford, and Robert 2015).

According to FAO (2011), pastoralists usually graze over areas outside farm lands, and these have been accepted to be the norm from time immemorial. Their movements are opportunistic and follow pasture and water resources in a pattern that varies seasonally or year-to-year according to availability of resources (FAO, 2011). The patterns of movement may be controlled by seasonal climate variations. However, increase in population, drying of waterholes, shifting in rainfall pattern leading to drought as a result of the changing climate affects both sectors of agriculture. At the same time, smaller and local agricultural production systems are becoming more and more integrated into the global economy, pushing up land values. These, coupled with the absence of good governance and the increase in level of poverty creates avenue for conflicts. Both customary and statutory land management systems are often not responding adequately to the tenure insecurity these changes bring (Djire et al. 2014).

McCarthy (2000) asserts that extensive livestock production in the form of pastoral livestock keeping is among the most suitable means of land use in arid areas of Africa because of its adaptability to highly variable environmental conditions Livestock here signifies cattle, sheep and goats. In Nigeria, most pastoralists do not own land but graze their livestock in host communities (Awogbade, 1997). While a few have adopted the more sedentary type of animal husbandry, the increasing crises between farmers and pastoralist presupposes that grazing is a major means of animal rearing in Nigeria. The sedentary type of animal husbandry also proves to be more expensive, difficult to manage and inefficient for the rapid growing market of an ever increasing population like Nigeria.

As observed by Nuru (1990), pastoralism remains the most ancient trade that is still strong and self-provisioning. While many pastoral regions are the focus of current farmer-pastoralist conflict studies, the long history of sustainability and resilience evidenced by these cultures and their contribution to the economy is of great interest. In Nigeria, there is a large proportion of the population involved in herding and are making a significant contribution to the economy. The groups of people that are actively involved in pastoral activities in Nigeria are the Kanembu, Kwoya, Manga, Fulbe (Fulani) and the Shuwa Arabs. The Fulbe are the largest owners of livestock accounting for about 90% of the nation's

stock, contributing one third of the Agricultural Gross Domestic Product (GDP) and 3.2% of the national GDP (Fabusoro and Oyegbami, 2009). The Nigerian cattle market generates only 6.8 billion USD of a potential 20 billion USD annually due to local strives and inability of government to fully recognise the industry (Okello, 2014).

Pastoralism is economically viable to the extent that it contributes significantly to the economy of many developing countries despite continued underinvestment (Hatfield and Davies, 2006). It contributes largely to the growth of local economies, and a cumulative contributor to the nation's GDP and plays a major role in providing on-demand protein to the wider population. In this part of the world, where inland fish is meagre and offshore fishing have not been well explored to provide sea food as part of a diet, meat, milk as well as butter are the major sources of protein. In addition, thousands of Nigerians make a daily living from the sale, transport, processing and marketing of livestock products that include meat, milk, butter, hides and skins, bones and as ploughing power to farmers. In the Federal Capital Territory (FCT) alone, 4,000 goats and over 400 cattle supplied by the Fulbe are slaughtered every day (Okello, 2014). Cattle owners are the only people paying the Jangali (per head cattle levy) to the government since prior to independence (Adebayo, 1995).

Pastoralists exert control over their animals based on their preferences for livestock's products they make a living of either directly, or indirectly, through the usage of products from domesticated animals (Spooner, 1973).

Directly in the form of meat, blood, milk, hair, wool and hides, usually referred to as primary pastoral products. Secondarily, (but nonetheless direct) pastoral products are butter, cheese, cloth and carpets.

Indirect use of pastoral products refers to subsistence via trading and bartering, formal and informal markets.

Marx (2006) asserts that more recently, the predominant subsistence aspect of being nomadic pastoralist (i.e. based mainly on animal products such as meat, milk, wool and hides) has been questioned. While previously, any involvement in the commercialization of livestock and livestock products was viewed as a modern invention and not part of the "traditional" way of life, Marx (2006) argues that a new model/definition of nomadic pastoralism has come to terms with the fact that:

1. Pastoralists produce, at least to some degree, for markets and therefore depend on the city and the state.
2. Pastoralism cannot be treated as a self-contained or as only a subsistence economy.

3. Pastoralists engage in a variety of occupations, the relative importance of which change according to economic changes.

Nomadic pastoralists live in societies in which the husbandry of grazing animals is viewed as an ideal way of making a living and the regular movement of all or part of the society is considered a normal and natural part of life. Pastoral Nomadism is commonly found where climatic conditions produce seasonal pastures but cannot support sustained agriculture. The nomadic pastoralism was a result of the Neolithic revolution. During the revolution, humans began domesticating animals and plants for food and started forming cities. Nomadism generally has existed in symbiosis with such settled cultures trading animal products (meat, hides, wool, cheeses and other animal products) for manufactured items not produced by the nomadic herders (Copeland, Wescombe and Henri 1966). The "early farming populations used livestock mainly for meat, and that other applications were explored as agriculturalists adapted to new conditions, especially in the semi-arid zone" (Sherratt and Andrew, 1983).

Of the estimated 30–40 million nomadic pastoralists worldwide, most Nomadic Pastoralist are found in central Asia and the Sahel region of West Africa. Increasing numbers of stock may lead to overgrazing of the area and desertification if lands are not allowed to fully recover between one grazing period and the next. Increased enclosure and fencing of land

has reduced the amount of land available for this practice. There is substantive uncertainty over the extent to which the various causes for degradation affect grassland. Different causes have been identified which include overgrazing, mining, agricultural reclamation, pests and rodents, soil properties, tectonic activity, and climate change (Ho and Azadi, 2010). Simultaneously, it is maintained that some, such as overgrazing and overstocking, may be overstated while others, such as climate change, mining and agricultural reclamation, may be under reported. In this context, there is also uncertainty as to the long-term effect of human behavior on the grassland as compared to non-biotic factors (Ho, 2001).

As stated by Beck (1991) often traditional nomadic groups settle into a regular seasonal pattern of transhumance. An example of a normal nomadic cycle in the northern hemisphere is:

1. Spring (early April to the end of June) — transition
2. Summer (end of June to late September) — a higher plateau
3. Autumn (mid-September to end of November) — transition
4. Winter (from December to the end of March) — desert plains.

The movements in this example are about 180 to 200 km. Camps are established in the same place each year; often semi-permanent shelters are built in at least one place on this migration route.

The agriculturist lives from domesticated plants and the pastoralist lives from domesticated animals. Since animals are higher on the food chain, pastoralism supports a thinner population than agriculture. Pastoralism predominates where low rainfall makes farming impractical. Full pastoralism required the Secondary products revolution when animals began to be used for wool, milk, riding and traction as well as meat. Where grass is poor herds must be moved, which leads to nomadism. Some peoples are fully nomadic while others live in sheltered winter camps and lead their herds into the steppe in summer. Some nomads travel long distances, usually north in summer and south in winter. Near mountains, herds are led uphill in summer and downhill in winter (transhumance). Pastoralists often trade with or raid their agrarian neighbors (David, 1998).

Khazanov (1994) presents five characteristics of Nomadic Pastoralism:

1. Pastoralism is the predominant economic activity.
2. Extensive – keeping herds of livestock all year round on a system of free-range grazing.
3. Periodic mobility within the boundaries of specific grazing territories (as opposed to migrations).
4. The participation in pastoral mobility of all or the majority of the population
5. Production for subsistence.

2.1.5 Conflict

Many scholars in the field of conflict resolution and peace building process have defined conflict in a way that enables us to understand its meaning. Hence, Fisher (1990) defined conflict as an incompatibility of goals or values between two or more parties in their relationship combined with attempts to control the antagonistic feelings of each other. Conflicts are mean to solve and overt complete fission; thereby preserving some kinds of unity (Gemechu, 2007). It is a relationship between two or more parties in which each party perceives the other's goals, values, interests or behaviors as antithetical to its own advantage.

Conflict refers to some form of friction, or discord arising within a group when the beliefs or actions of one or more members of the group are either resisted by or unacceptable to one or more members of another group. To take another definition of conflict, Michael (1992) defines it as an activity which takes place when conscious beings (individuals or groups) wish to carry out mutually inconsistent acts concerning their wants, needs or obligations. Conflict is an escalation of a disagreement, which is its common prerequisite, and is characterized by the existence of conflict behavior, in which the beings are actively trying to damage one another. Conflict can arise between members of the same group, known as intragroup conflict, or it can occur between members of two or more groups, and involve violence, interpersonal

discord conflict. Conflict in groups often follows a specific course. Routine group interaction is first disrupted by an initial conflict, often caused by differences of opinion, disagreements between members, or scarcity of resources. At this point, the group is no longer united, and may split into coalitions. This period of conflict escalation in some cases gives way to a conflict resolution stage, after which the group can eventually return to routine group interaction.

Conflict is a social process that is exacerbated when individual members of a group take sides in the debate. Among the methods to resolve conflict is mediation of the dispute by a group member not currently involved in the dispute. More specifically, a mediator is defined as a person who attempts to resolve a conflict between two group members by intervening in this conflict. Put simply, the mediator can be thought of as a disinterested guide directs the disputants through the process of developing a solution to a disagreement (Forsyth, 2006). Although the tendency will be for group members who are uninvolved in the dispute to remain uninvolved, in some cases, the sheer intensity of the conflict may escalate to the point where mediation is unavoidable. Third party mediation of the conflict opens avenues for communication between group members in conflict. It allows members to express their opinions and request clarification of other member's standpoints while the mediator acts as a form of protection against any shame or "loss of face"

that either disputant may experience. This can be done by shedding a positive light on the reconciliation that was made during the mediation process. For instance, if it was negotiated that two cashiers will rotate the weekends they work, the mediator might point out that now each worker gets a weekend off every two weeks (Forsyth, 2006). The mediator can also offer assistance in refining solutions and making counter-offers between members, adjusting the time and location of meetings so that they are mutually satisfying for both parties (Forsyth, 2006).

Conflict is a manifest in structural inequity and unequal distribution of power. It is a situation with at least two identifiable groups in conscious opposition to each other as they pursue incompatible goals. Conflicts are common phenomena in many regions of the world, especially in dry lands, that are endowed with scare natural resources. The term "conflict" has been variously conceptualised, however, the multiplicity of the definition has always pointed at one direction; that conflict is an enduring aspect of social existence. It is believed that wherever a community of individuals are found, conflict is basically a part of their experience. Thus, most conflicts are social in character and usually arise as human beings pursue their different survival and security needs.

In this regard, Stagner (2007) defined conflict as: A situation in which two or more human beings desire goals which they perceive as being

obtainable by one or the other but not yet by both; each party mobilizing energy to obtain a goal, desire objective or situation and each party perceive the other as a barrier or threat to such goal. According to Coser (2006), conflict is a struggle between parties over desirable value. According to him, conflict refers to struggle over values or claim to status, and scarce resources, in which the aim of the conflicting parties are not only to gain the desired value, but also to neutralize, injure or eliminate their rivals. One critical defining element is the presence of two or more actors struggling to secure a thing adjudged to be valuable of which gained by any actors, amount to a loss or deprivation to the other actors. The benefit goes with the successor together with access to or control of the value and deprivation of insecurity follows the denial of access to such value. In this wise, Mark and Synder (1991) opined that, element of all conflict is the existence of result scarcity where the wants of all actors cannot be fully satisfied and where the quest for such resources result in conflict behaviour. Consolidating on the above views, Dougherty and Ptalzgarff (2001) maintained that, the term conflict refers to a condition in which one identifiable group of human beings in a given environment (whether tribal, ethnic, linguistic, cultural, religious, socio-economic, political among others) is engaged in conscious position to or more identifiable human groups because they are pursing what appears to be incompatible goals.

According to Galtung (2003), full conflict involves contradiction, attitudes, behaviors and the roots of conflict are contradictions. According to him, contradictions are the actual or perceived incompatibility of goals between the conflicting parties and attitudes are the perceptions and misperceptions that the parties pose towards self and others. Behaviors are the actions and measures that the parties take in the pursuit of their goals. Conflict is a process towards change rather than an incident and as a process it has its own stages and levels of development (Regassa, 2009). Alemayehu (2010) asserts that conflict is a social situation in which a minimum of two parties (actors) strive to acquire at the same movement in time, an available set of scarce resources, which is difficult. Existence of incompatible goals is, essential for the outbreak of conflict. Conflicts are common phenomenon across the world; Africa is not an exception in this respect. Most importantly, the Horn of Africa region is one of the most conflict ridden areas in the continent.

Conflicts have been variously defined in relation to ‘fights, games and debates’ (Rapoport, 1990). This remains controversial. For example, some have used ‘conflict’ to refer both to ‘consensual’ conflicts over interests (disputants want the same thing) and to ‘dissensual’ conflicts over values (disputants do not want the same thing) (Aubert, 1963); others, however, have called the former ‘disputes’ that require

settlement and have reserved the term ‘conflict’ for deeper struggles over unsatisfied human needs that require resolution (Burton, 1990).

According to Forsyth (2006), there are three major mediation approaches: Inquisitorial procedure- Using this procedure, the mediator asks each of the disputants a series of questions, considers the two sets of responses, and then selects and imposes a mandatory solution on the members. The inquisitorial procedure is the least popular approach to mediation. Arbitration- Here, mediation involves the two disputants explaining their arguments to the mediator, who creates a solution based on the arguments presented. Arbitration is best for low intensity conflict, but is the most favored mediation style overall.

Moot- The moot approach involves an open discussion between disputants and the mediator discusses about the problems and potential solutions. In the moot approach, the mediator cannot impose a mandatory solution. After arbitration, a moot is the most preferred mediation style. In practice, conflict resolution is often interwoven with daily activities, as in organizations, workplaces and institutions. Staff and residents in a youth care setting, for instance, interweave everyday concerns (meals, lessons, breaks, meetings, or other mundane but concerted projects) with interpersonal disputes (Van Kleef, De Dreu and Manstead, 2004).

Conflicts between farmers and nomadic cattle herders have been a common feature of economic livelihood in West Africa (Tonah, 2006). In the period before the beginning of the 20th century, the problem was mainly restricted to the savanna belts of West Africa. Cattle rearing were mainly prevalent in the Guinea, Sudan and Sahel savanna belts where crop production was carried out only during the short rainy season on a small scale. This gave the cattle herders access to a vast area of grass land. As time went on, and with the introduction of irrigated farming in the Savanna belt of Nigeria, and the increased withering of pasture during the dry season, less pasture was available to cattle herders. The herdsmen had to move southward to the coastal zone where the rainy season is longer and the soil retains moisture for long, in search of pasture and water – a movement called transhumance.

The large number of wild animals and the fear of losing animals to diseases, especially try panosomiasis, prevented herders from settling permanently in the humid zone (Blench, 1994). Ekong (2003) enumerated that conflict may have positive and negative effects. In positive effect, people may not know that certain nagging issue exists. Thus conflict leads to clear definition of issue. Once such issue have been identified, they can them be amicably resolved. During conflict, group cohesion and solidarity increase and thus positive effect can be corrected for more efficient attainment of group goal. Conflict usually

leads to disunity, violence, disagreement and bloodshed because parties involved try to reach their objective. It is a form of social interaction in which the actors seek to obtain scarce by weakening or eliminating other contender.

Tonah (2006) stated that there is a consensus among observers that farmers-herders clashes have only since the 20th century become widespread in the coastal countries of West Africa., though Breusers et al. (1998) were of a dissenting view. They concluded after an investigation of farmers-herders relations in Burkina Faso that the conflict between Mossi farmers and Fulani herders was an old phenomenon. Tonah (2006) opined that the factors that account for the increasing farmer-herder conflict include the southward movement of pastoral herds into the humid and sub-humid zones, promoted by the successful control of the menace posed by disease, the widespread availability of veterinary medicine and the expansion of farming activities into areas that hitherto served as pastureland. He further suggested that since the 1950s, there has been a growth in human as well as livestock population in the coastal countries of West Africa. This gave rise to an increased pressure on natural resources and a stiff competition for available resources between farmers and herders (Adebayo, 2007).

Tonah (2006) is of the view that since the Sahelian drought of the 1970s and 1980s, and the accompanying migration of a huge number of pastoralists into the fringes of the humid forest zone of West Africa, there has been a massive increase of the incidence of farmers-herders conflict. Cases of farmers-herders conflict are widespread in Nigeria in recent times. For instance, in Densina Local Government of Adamawa State, 28 people were feared killed, about 2,500 farmers were displaced and rendered homeless in the hostility between cattle rearers and farmers in the host community in July 2005. Nweze (2005) stated that many farmers and herders have lost their lives and herds, while others have experienced dwindling productivity in their herds. The conflicts are a threat to peace and national stability. It also has implication for tribal co-existence, Nigeria being a multi-ethnic and a multi-tribal nation.

2.2 EMPIRICAL REVIEW

2.2.1 Ground Radar Technology and Unimpeded Intelligence Gathering

Romano (2014) in his study posit that the Soviet Union used a number of radar-equipped ocean reconnaissance satellites (RORSAT), which used strong radar systems, powered by an onboard nuclear reactor to gather intelligence and to visualize vessels. The result of this study is that these operated in the "pushbroom" manner, scanning a swath straight down. US radar satellites, however, have emphasized SAR and ISAR. To aid the U.S. Border Patrol in the time-consuming and difficult

task of locating smuggling tunnels, MITRE has designed a prototype system to boost the capability of ground-penetrating radar.

Fein (2014) in his study on ship-based radar stated that the AN/SPQ-11 Cobra Judy radar, on USNS ObservationIsland (T-AGM-23), could also be guided by the COBRA BALL electro-optical sensors on an RC-135. Cobra Judy was supplemented by Cobra Gemini on USNS Invincible (T-AGM-24) starting around 2000 and was replaced by Cobra King in 2014 on USNS HowardO. Lorenzen (T-AGM-25). In the write-up on Africa and South America, Missile and Space talked about who is Building New Surveillance Radars in Cuba? Why North Korea, Russia and China are All Prime Suspects and the report made was that a new surveillance radar installation has been detected near the town of Bejucal in Western Cuba, as part of a sizeable new signals intelligence facility being built in the area. The facility, located just a few miles from the United States mainland, is in an ideal location to gather valuable intelligence on American activities. The facility is reportedly capable of intercepting signals, tracking ballistic missiles and even monitoring U.S. space launches, providing invaluable data to whichever party is operating it.

2.2.2 Ground Radar Technology and Real-Time Surveillance and Interception

The study conducted by Alekhya Sai Punnamaraju (2013) on “Drone Intercepting Methods” made emphasis on a recent technology called the “DRONE” which is mostly referred to as an Unmanned Aircraft Systems (UAS) or Unmanned Aerial Vehicles (UAV). This study was conducted to emphasize the sophistication of the easy access to maneuvering this technology by almost anyone. There has been a lot of buzz in recent months about the fast-developing anti-drone industry. The result of the experiment proved that it is all because there has been an understanding that UAVs can create major threats beyond the conflict areas. Sometimes, camera-equipped UAVs surreptitiously invade people's privacy.

Gilad Beeri (2016) in his study also added that UAV can intercept data. However, there are more deliberate misuses. One such example is, they have already been used to smuggle drugs across prison walls. In 2015, the Secret Service reported at least two incidents where the drones flew into restricted airspace around the White House. While in Japan, an antinuclear activist was accused of using a drone to deliver a tiny amount of radioactive sand to Prime Minister Shinzo Abe’s office. Earlier, when they were expensive, complicated and fragile, having one was a big deal. As UAVs get cheaper to buy and easier to use, they’re

also going to get more and more annoying. Though people would be more careful while flying them, they can be used in about all the ways including best or objectionable, illegal or dangerous. Due to being affordable, the UAVs can normally be misused for spying, bomb dropping or to smuggle goods. This has imposed a security concern all over the world. Adding further to the concern, the drone market is expected to be worth $12 billion by 2021. The high volume of UAVs compels the expanding need for anti-drone solutions. The safety threats associated with the UAVs is creating an even wider need for expert anti-drone detection devices.

The proliferation of cheap and easy to fly drones has triggered a rise in the number of incidents where the safety and security of individuals and facilities has been compromised. They have infiltrated the security of heads of state, delivered contraband into prisons and photographed private film sets and celebrity's property. SkyWall100 is a handheld system that gives a mobile operator the ability to physically capture a drone in a specifically designed ‘drone entangling’ net. It uses compressed air to launch a projectile up to the drone after the operator has targeted it using the onboard Smart-Scope. SkyWall100 can be used as a standalone drone defense system but can also be integrated with a wider security system, using the skylink module, to offer a highly capable counter drone package. A single SkyWall100 system can protect

an area or multiple systems can be deployed from mobile units to protect a large site. The technology currently being fielded and developed within the region is now amongst some of the most capable in the world.

2.2.3 Ground Radar Technology and Secure Communication

A study carried out by Leonardo (2018) proved that he had embraced a high-level strategy for ensuring continued advancement in our core technology areas. The result of the experiment proved that in-house laboratories devoted to specific areas of applied research, promotes the effective integration of new, innovative components within our existing radar portfolio and the new developments for promotion of communication. According to him, a key element of this strategy is the design of the most advanced fully AESA Kronos family radar, fixed faces, staring and rotating – X, C and L band, based on the totally-owned GaAs and GaN technologies.

The radar portfolio includes the RAT 31 family long-range radar, fixed and deployable, for Early Warning Surveillance as well as Fire Control Radar (NA30S family and Falco Plus) for gunnery control and missile battery guidance. Passive surveillance (AULOS), Precison Approch Radar (PAR) and IFF for Naval and Land application together with 2D surveillance radar for Coastal and Navigation applications complete the Land & Naval Defence Electronics Division's wide range of radar sensors. Dotinga, Randy 2004 states that the United Kingdom, as well,

is working on plans to build up a fleet of surveillance UAVs ranging from micro-aerial vehicles to full-size drones, to be used by police forces throughout the U.K.

2.2.4 Ground Radar Technology and Identity Establishment and Verification

The Radar Cross Sections (RCS) of both small and large for High Frequency Wave Radar (HFSWR) were studied by using Numerical Electro-magnetic 'Ode 141 and by measurement from a HFSWR system (2010) at Cape Race' Newfoundland' Canada. The results of the study indicate that Teleost, a 2405-ton Canadian Coast Guard ship, and large cargo container vessels (-36000 ton) have comparable RCS values at 3" and 4'1 MHz'. This was verified by comparing signals with the reflections of seven cargo container vessels identified during an operational evaluation of the HFSWR. The conclusion of the study is that Teleost and the large cargo container vessels have an angle averaged of -40dBm2' small vessels (-'Oo0 tons) could reasonably be characterized by an angle-averaged RCS of -30 dBm', in the lower end of the HF band (3-5MHz). Absm-. One of the parameters in the radar equation that determines the radar performance is the radar cross section (RCS) of the target. High Frequency Surface Wave Radar (HFSWR) in a coastal surveillance role is designed mainly to detect ships over a sea

surface. The radar cross section of the ship to be detected is therefore a critical parameter in the design of the HFSWR.

Little is discussed in the open literature about the RCS of ships of various sizes and at different aspects for HFSWR, although the free-space radar cross section of a vessel in m2 is sometimes approximated by where D is the full-load displacement of the vessel in kiloton and f is the radar frequency in MHz. The above empirical formula was derived from measurements made at X, S and L bands, and extended as a rough approximation to the HF band for HFSWR [Z]. The formula, however, does not consider the significance of the effect of vessel height on vessel RCS. Vertical-polarized transmission is used in HFSWR. The vessels of interest could have masts that are as high as 25 m. This means that in the HF hand, the vessel RCS is in the Rayleigh and resonance regions. In the Rayleigh region, the target RCS decreases rapidly with radar wavelength. In the resonance region, the target RCS fluctuates within a confined range with radar wavelength. The height of the vessel is therefore significant in determining the RCS for HFSWR.

Leighton & Martin (2014) carried out a study of the RCS for small and large commercial vessels in the lower end of the HF band (3-5 MHz) using Numerical Elecnomagnetics Code (NEC) and trial data from the HFSWR at Cape Race refer to those Newfoundland, here small displacements of -1000 ton and large vessels refer to cargo-container

ships with displacements of several tens of groups of ships routinely tracked by kilotons, These are the HFSWR, A generic small vessel is modeled after Teleost, a 2405.ton Canadian coast guard ship (CCGS). Teleost was used as a control target in a trial to provide measurements of the target signal at selected aspects. The ship sailed outbound and then inbound along the boresight to provide measurements at stem-on and bow-on aspects. At a close range, the ship also tumed to provide measurements at every 30 degrees. The structure of the ship was modeled using a simple wire-grid model and the RCS of the ship was calculated using NEC. The calculated RCS was then compared with the RCS estimated from the measurements using the first-order sea echo in a fully developed sea.

A favourable comparison led to confidence in the model. This model was then scaled down to provide the radar cross sections of the smaller ships. A second teal at Cape Race was carried out during an operational evaluation of the radar from which the identities and positions of seven cargo. The length of the ship is 63 m and the breadth is 14.2 m. To calculate the RCS of the model, the grid is reflected in the horizontal plane, and then NEC calculates the cross section of the entire structure. Hence, the results here refer everywhere to the "net" RCS not to the equivalent free-space RCS which is made 12 dB smaller in order to account for the gains of antennas operating over a conducting surface.

To test the effect of grid spacing, two Teleost models were generated, first with 3.5-m.

2.3 THEORETICAL FRAMEWORK

2.3.1 Structuration Theory

As information technology (IT) pervades numerous aspects of human life (e.g. work, social, family) at multiple levels individuals, teams, organizations, markets, countries, and society an increasing number of researchers have looked for alternative ways to study IT interactions (Klein 1999; Lee et al. 1997; Walsham 1995). Among current developments in IT research are the articulation by several researchers of the main assumptions of Giddens's structuration theory (ST) (Barrett and Walsham 1999; Majchrzak et al. 2000; Orlikowski 2000; Sahay 1998) and the publication of literature reviews on the use of Structuration T in IT research (Jones 1997; Jones and Karsten 2003; Pozzebon and Pinsonneault 2000; Rose 2000; Walsham and Han 1991).

ST has been seen as a promising theory to resolve the longstanding debate concerning the relationship between structure and agency, a challenge not confined to IT or even to organization theory. In fact, such a debate is among the most ubiquitous and difficult issues in the whole of social theory (Cohen 1989; Giddens and Pierson 1998).

The theory of structuration is a social theory of the creation and reproduction of social systems that is based in the analysis of both

structure and *agents* without giving primacy to either. The theory of structuration embodies this mutual dependence of structure and agency. The neologism adds to the static word ‘structure’a sense of action over time: structuration implies an active historical process. Structuration happens as agents draw on the various rules and resources of their systems; as they do so, they either reproduce or amend the structural principles that organized their activities in the first place. Thus, structuration theory admits structural continuity while allowing for deliberate innovation and change. Structures typically work like language: at the core, sufficient stability to allow the effective storing of knowledge over time; at the margins, the creation of new words and usages to accommodate changing needs and circumstances (Giddens, 1993). Managers, then, can be seen as constantly drawing on past arrangements as they repeat, tinker with, bend or challenge what worked for them previously.

The theory was proposed by sociologist Anthony Giddens, most significantly in The Constitution of Society, which examines phenomenology, hermeneutics, and social practices at the inseparable intersection of structures and agents. Its proponents have adopted and expanded this balanced position. Giddens observed that in social analysis, the term *structure* referred generally to "rules and resources" and more specifically to "the structuring properties allowing the

'binding' of time-space in social systems". These properties make it possible for similar social practices to exist across time and space and that lend them "systemic" form. Agents—groups or individuals—draw upon these structures to perform social actions through embedded memory, called *memory traces*. Memory traces are thus the vehicle through which social actions are carried out. Structure is also, however, the result of these social practices (Giddens, 1993). Thus, Giddens conceives of the duality of structure as being:

> ...the essential recursiveness of social life, as constituted in social practices: structure is both medium and outcome of reproduction of practices. Structure enters simultaneously into the constitution of the agent and social practices, and 'exists' in the generating moments of this constitution.

Giddens uses "the duality of structure" (i.e. material/ideational, micro/macro) to emphasize structure's nature as both medium and outcome. Structures exist both internally within agents as memory traces that are the product of phenomenological and hermeneutic inheritance and externally as the manifestation of social actions. Similarly, social structures contain agents and/or are the product of past actions of agents. Giddens holds this duality, alongside "structure" and "system," in addition to the concept of recursiveness, as the core of structuration theory. His theory has been adopted by those with structuralist inclinations, but who wish to situate such structures in human practice rather than to reify them as an ideal type or material property.

Social systems have patterns of social relation that change over time; the changing nature of space and time determines the interaction of social relations and therefore structure. Hitherto, social structures or models were either taken to be beyond the realm of human control the positivistic approach or posit that action creates them—the interpretivist approach. The duality of structure emphasizes that they are different sides to the same central question of how social order is created.

Structure and society: Structures are the "rules and resources" embedded in agents' memory traces. Agents call upon their memory traces of which they are "knowledgeable" to perform social actions. "Knowledgeability" refers to "what agents know about what they do, and why they do it." Giddens divides memory traces (structures-within-knowledgeability) into three types:

i. Domination (power): Giddens also uses "resources" to refer to this type. "Authoritative resources" allow agents to control persons, whereas "allocative resources" allow agents to control material objects.
ii. Signification (meaning)
iii. Legitimation (norms): Giddens sometimes uses "rules" to refer to either signification or legitimation. An agent draws upon these

stocks of knowledge via memory to inform him or herself about the external context, conditions, and potential results of an action.

When an agent uses these structures for social interactions, they are called modalities and present themselves in the forms of facility (domination), interpretive scheme/communication (signification) and norms/sanctions (legitimation).

Agents and society: Giddens' agents follow previous psychoanalysis work done by Sigmund Freud and others. Agency, as Giddens calls it, is human action. To be human is to be an agent (not all agents are human). Agency is critical to both the reproduction and the transformation of society.

Another way to explain this concept is by what Giddens calls the "reflexive monitoring of actions." "Reflexive monitoring" refers to agents' ability to monitor their actions and those actions' settings and contexts. Monitoring is an essential characteristic of agency. Agents subsequently "rationalize," or evaluate, the success of those efforts. All humans engage in this process, and expect the same from others. Through action, agents produce structures; through reflexive monitoring and rationalization, they transform them. To act, agents must be motivated, must be knowledgeable must be able to rationalize the action; and must reflexively monitor the action.

Agents, while bounded in structure, draw upon their knowledge of that structural context when they act. However, actions are constrained by agents' inherent capabilities and their understandings of available actions and external limitations. Practical consciousness and discursive consciousness inform these abilities. Practical consciousness is the knowledgeability that an agent brings to the tasks required by everyday life, which is so integrated as to be hardly noticed. Reflexive monitoring occurs at the level of practical consciousness. Discursive consciousness is the ability to verbally express knowledge. Alongside practical and discursive consciousness, Giddens recognizes actors as having reflexive, contextual knowledge, and that habitual, widespread use of knowledgeability makes structures become institutionalized.

An important implication of structuration, therefore, is that structures are not fixed or given. Of course, there is typically a good deal of continuity in the arrangement of structural rules and resources within society. Giddens (1984) describes the relatively enduring structural properties of systems as institutions, which tend to confront each individual as solid and apart (see Balogun, Beech and John- son, this volume). At the highest level, the capitalist system is an institution, its structural properties stretching over time and space in a way far beyond isolated efforts at change. Ultimately, however, Giddens insists that structures exist only as they are instantiated in action or as people retain

them in their memories. In the eyes of critics and rivals (such as Archer 1995), this formulation seems to give structures an ephemeral and immaterial character: the past has only weak influence over the present, and resources are somewhat virtual. Giddens'formulation also points to important truths, however. Rules that are forgotten have no purchase; there is little value to resources unless rights over them are recognized; left unused, rules and resources soon fall into desuetude. The structural properties of a system are ultimately only reproduced, therefore, to the extent that its members continue to draw on them in action.

The relevance of this theory to the study is that structuration theory allows for innovation and change, this can be applied in handling the nomadic pastoralist conflict. Innovation here involves the development of strategy like the ground radar technology and using it to effectively monitor the activities in those communities highly prone to conflict. Structural principles are only relatively enduring, with the struggles of the everyday liable to amend them. Strategic conduct analysis typically calls on anthropological or ethnographic modes of 'thick description'; it might apply, for instance, to the study of a group of strategists at work on the creation of strategy for the nomadic pastoralists conflict in a particular community.

This buoys down to applying ground radar technology in solving nomadic pastoralists conflict. Giddens, structuration theory and strategy

as practice hereby proposes a distinction between the analysis of strategic conduct, the means by which actors draw on their structural rules and resources in their social activities, and institutional analysis, which suspends interest in conduct for the understanding of institutional context across space and time.

2.3.2 Information Infrastructure Theory

Information Infrastructure theory (Blechar & Hanseth, 2007; Hanseth & Lyytinen, 2010) addresses issues of control and change in relation to the complexity created by increased convergence of digital technologies (Tilson, Lyytinen, and Sørensen (2010). As a result of the digital convergence, single systems are seldom isolated but rather deeply socially and technologically embedded (Tilson et al., 2010) and conditioned by installed bases of socio-technical arrangements (Henfridsson & Bygstad, 2013). The notion of information infrastructure offers two important advantages: it changes the object of study from a single application within an organization to large socio-technical networks; and it offers a new perspective on how such networks develop.

While risks play an important role in the evolution of information infrastructure, there has been little emphasis on understanding risk practices as they play out within information infrastructure evolution. Rather, the concept of risk has been used to explain how side- effects

and unintended consequences challenge established notions of control (Hanseth, Ciborra, & Braa, 2001). Information infrastructure theory offers an alternative perspective on the character and role of IT in organizations and organizational change processes. Rather than focusing on isolated information systems, it recognizes the heterogeneity of the social and technological components of contemporary organizational life (Star & Ruhleder, 1996) and adopts an emergent and sociomaterial view of agency and practice, thus building on significantly different ontological and epistemological assumptions than the bulk of IS research on risk. It is also a perspective that has made significant contributions to other areas of IS research as it has proven useful for conceptualizing the collectives of interconnected information systems in organizations (Hanseth & Lyytinen, 2010; Henfridsson & Bygstad, 2013).

Information infrastructures can be conceived as a negotiation process outcome among different information systems, work practices, and routines in the daily activities of organizations, but also as the context within which this negotiation takes place. Information infrastructures emerge out of this negotiation, but the negotiation itself defines the actors involved in it and the context where it takes place.

By discussing the more recent literature on II, it is possible to depict these dynamics and provide a substantial argument in favour of the idea

underpinning this work, in which IIs are dynamic phenomena that evolve and change over time. As argued by Weill and Broadbent (1998), information infrastructures get implemented to foster business strategies and to improve the competitive capabilities of firms. Implementations of IIs can thus be considered strategic responses to external market forces that pressure companies in competitive markets. At the same time, these implementations define and re-define the market forces within which companies compete. In the late nineties, for example, IBM largely reorganized the infrastructure around a CRM system to better position the company in the global market and to survive increased industry competition (Ciborra & Failla, 2000).

Implementing a CRM, IBM aimed at speeding up the sequence of activities needed to complete a negotiation cycle: starting with the identification of business opportunities, continuing through to making an offer, writing the contract, and delivering the solution, and ending with the monitoring of customer satisfaction. This implementation, however, changed the competitive environment where IBM competed. As discussed by Bakos and Treacy (1986), strategic investment in ICT influences industry forces which themselves have a direct effect on firm performance.

Information infrastructures are not only deployed to respond to competitive needs, but also to comply with technological innovations

that reshape a company's IT domain. New industry standards push the organization infrastructure to change so that it is interoperable with widely adopted standards. The tension between standardization and flexibility characterises all infrastructural standards (Hanseth, Monteiro, & Hatling, 1996) and pushes for continuous changes and adaptations in the information infrastructure. This tension becomes the main force that reshapes the information infrastructure. But at the same time, the adoption of standards reinforces de facto standards, shaping the technological domain companies operate in. For the same reason, a new infrastructure calls for changes and adaptations in the existing information infrastructure. These changes can be both technological and organizational.

New standards have to be designed to guarantee the interoperability of the new infrastructure with all systems in place (installed base). Changes in standards and the development of technological gateways increase the complexity of the technological systems and make future changes and adaptations more difficult and demanding (Hanseth & Braa, 2000). Once again, the installed base gets reinforced and becomes more difficult to change.

Similarly, the implementation of an information infrastructure calls for changes in the internal organization of processes and organizational routines. New IIs facilitate the re-organization of work processes and

routines because the technological architecture redistributes and re-organizes the information flow, and thus the interdependence among pre-existing organization departments and functions (Kallinikos, 2006). Contextually, the new II defines these organizational information flows and interdependence. II can in fact prescribe a set of organizational protocols and procedures that constrain organization action in specific circumstances (Timmermans & Berg, 1997).

Every change in technology or in the organization of work activities produces side effects. Groups of users as well as technologies are always affected by changes in the information infrastructure, but they are also forces that produce these changes. These effects can be either negative, so that changes leave “angry orphans” (Hanseth, 1996), or positive, making these actors reinforce their interests in the information infrastructures. Whether the effects are negative or positive, both cases generate forces that shape the II. Organization agents can align their interest with a specific technology thus reinforcing the role of this technology in the organization, but technology itself can align different interests and lead to unexpected outcomes, betraying the initial supporters (Hanseth & Braa, 1998).

The implication to this study is that countries are increasingly dealing with the development of technological solutions such as the development of ground radar systems which have to interact with

existing technological systems, thus multiplying the number of existing systems, the need for interaction among them, and their intricacy. Information systems are increasingly interconnected and intertwined in complex information infrastructures, such that the notion of IIs and their study has witnessed growing interest in information systems research. When information infrastructures such as ground radar technology are deployed in a farmer - nomadic pastoralist conflict zone to monitor crises, it will produce an outcome of the relational status that continuously shapes and reshapes their characteristics. This relational status of shaping and reshaping reveals information infrastructures are the output of the recursive dynamic interaction between technology and people.

2.3.3 Securitization Theory

This theory is an analytical framework intended to increase understanding about how traditional and non-traditional security threats are perceived and managed chiefly by states. The main argument of securitization theory is that security is an (illocutionary) speech act that solely by uttering 'security' something is being done. Weaver (2004) asserts that it is by labelling something a security issue that it becomes one. By stating that a particular referent object is threatened in its existence, a securitizing actor claims a right to extraordinary measures to ensure the referent object's survival. The issue is then moved out of

the sphere of normal politics into the realm of emergency politics, where it can be dealt with swiftly and without the normal (democratic) rules and regulations of policy-making. For security this means that it no longer has any given (pre-existing) meaning but that it can be anything a securitizing actor says it is. Security is a social and inter-subjective construction.

Buzan (1998) asserts that to prevent 'everything' from becoming a security issue, a successful securitization consists of three steps. These are: (1) identification of existential threats; (2) emergency action; and (3) effects on inter-unit relations by breaking free of rules (Buzan, 1998). To present an issue as an existential threat is to say that: 'If we do not tackle this problem, everything else will be irrelevant (because we will not be here or will not be free to deal with it in our own way)' (Buzan, 1998). This first step towards a successful securitization is called a securitizing move. A securitizing move is in theory an option open to any unit because only once an actor has convinced an audience (inter-unit relations) of its legitimate need to go beyond otherwise binding rules and regulations (emergency mode) can we identify a case of securitization. In practice, securitization is thus far from being open to all units and their respective subjective threats. Rather, it is largely based on power and capability and therewith the means to socially and politically construct a threat. In this way the study of security remains

wide, but with restrictions pertaining to ‘who’ can securitize it is neither unmanageable nor incoherent. This being said it should be noted that Weaver (1998) is extremely critical of framing issues in terms of security. For him: ‘security should be seen as a negative, as a failure to deal with issues of normal politics’ (Buzan, 1998). Because of this, he favours a strategy of desecuritization whereby securitization is reversed and issues are moved out of ‘the threat-defence sequence and into the ordinary public sphere’ where they can be dealt with in accordance with the rules of the (democratic) political system. Although this is clearly a normative statement on the part of Weaver, it is important to notice that it has no bearing on what securitization theory can do. While for normative theorists being political lies at the very heart of their approach to security, in Weaver’s securitization theory being political (intended or unintended) is only of secondary importance. This is because being political can never replace the political act that is securitization/desecuritisation (Weaver, 2000). Securitization/desecuritization is a political choice by a securitizing actor, which the analyst seeks to uncover by means of using securitization theory.

The application of this theory to the study draws on the analytical strength of this approach which is based on its ability to situate a community at the heart of security. This therefore means that the welfare

of the people affected by the nomadic pastoralist conflict should be paramount. In other words, the physical security of people as well as the socio-economic wellbeing of the people should be prioritized by the state. The scope of global security should be expanded to include threats in seven areas such as human security which requires using ground radar technology to monitor the activities in conflict zone.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Research Design

This study adopted an exploratory research design. Because the design studies phenomena after they have occurred. The researcher does not have direct control of independent variables because their manifestation have already occurred. The researcher cannot manipulate the effects but just obtain the effect on already existing natural course of events. It involves the investigation of relationship among variables. Hence this design is relevant to this study, ground radar technology in security surveillance of farmer - nomadic pastoralists in conflict zones of Nigeria

3.2 Population of the study

Using purposive or judgmental technique, the population of the study comprises of personnel's (unit commanders and two assistants) of OPERATION SAVE HAVEN IN PLATEAU STATE, OPERATION WHIRL STROKE IN BENUE STATE and OPERATION WHIRL STROKE IN TARABA STATE, made up of the Nigeria Police, Nigerian Army, Nigerian Air Force, Nigerian Navy, Department of State Services and Nigeria Security and Civil Defence Corps from three states (Plateau State, Benue State and Taraba State).

See Table 1 below:

Table 1: Organization and Number of Respondents

S/N	STATE / ORGANIZATION/ ESTIMATED POPULATION			
	Plateau State (Operation Save Heaven)		Benue State (Operation Whirl Stroke)	Taraba State (Operation Whirl Stroke)
1	Nigeria Police Force	4	4	4
2	Nigerian Army	4	4	4
3	Nigerian Airforce	4	4	4
4	Nigerian Navy	4	4	4
5	DSS	4	4	4
6	NSCDC	4	4	4
	Sub Total	24	24	24
		Total Number of Respondents		**72**

Source: Field 2018

3.2.1 Sample and Sampling Technique

Seventy-two (72) respondents were randomly selected for the study using non-proportionate stratified sampling technique. This is necessitated by the fact that the questionnaires were administered to 4 respondents (head of operation with assistant and head of administration with assistant) in each of the 6 aforementioned organisations in the three states.

3.2.2 Research instrument

The researcher developed an instrument tagged: 'Ground radar technology and security surveillance of farmer - nomadic pastoralists in conflict zone Questionnaire (GRTSSFNPCZQ). The questionnaire was designed using the five point Likert type scale and divided into two sections with an introduction to assure the respondent of the confidentiality of their responses. Section A was the demographic part measuring name of organization, sex of the respondents and age of the respondents, while Sections B addressed variables in objectives one, two, three, four and five.

3.2.3 Validation of the instrument

The main instrument meant for use in this study was a research questionnaire. The instrument was first content validated by the researcher's supervisor and two expert from test and measurement and evaluation department of Nasarawa State University as well as security and strategic studies department lecturers, scrutinized the instrument. The validators were required to assess the validity of the items measuring the variables in the research.

3.2.4 Reliability of the Instrument

A test-retest reliability was used to determine the reliability of the instrument. In the trial testing, 40 respondents who do not form a part of the main study were randomly selected from two organisations and the

instrument administered on them. The same procedure was repeated on the same subjects after one week. Data collected from the respondents were subjected to test-retest statistical analysis using Crumbach Alpha for justification of the instrument and it produced the coefficient index of 0.89 proving the instrument reliable for the study.

3.3 Methods of Data Collection

Administration of the instrument took a process of time to go through. This was done personally in collaboration with two trained research assistants who were carefully selected and trained for the exercise by the researcher. In this case the researcher visited the selected organizations set aside for the study, with the letter of permission and introduction to administer the questionnaire to the respondents himself with the help of an assistant. In each organization, the researcher called on the head and explained his mission and thereafter solicited the cooperation of the respondents. The researcher explained that their responses would be treated with strict confidence for the purpose of the research only.

3.4 Technique for Data Analysis and Model Specification

This study used descriptive statistics such as percentage analysis to analyse the data in respect to the research questions. However, for the hypotheses the researcher used Ordinal Regression Analysis to test them. Test for significance was done at 0.05 alpha level. The result was

considered significant if the calculated value was either equal to or greater than the table value but non-significant if less.

$$EAAi = \alpha + \beta GRTi + \varepsilon i$$
$$UIGi = \alpha + \beta GRTi + \varepsilon i$$
$$RSIi = \alpha + \beta GRTi + \varepsilon i$$
$$SCi = \alpha + \beta GRTi + \varepsilon i$$
$$IEVi = \alpha + \beta GRTi + \varepsilon i$$
$$CSSi = \alpha + \beta GRTi + \varepsilon i$$

Where:

EAA	=	Equipment Adequately Available
UIG	=	Uninterrupted Intelligence gathering
RSI	=	Real-time Surveillance and Interception
SC	=	Secure Communication
IEV	=	Identity Establishment and Verification
CSS	=	Challenge in Security Surveillance

3.5 Justifications of Methods

The choice of the exploratory research is based on the fact that the study sought to get the opinions of the commanders heading the administration and operation and some of their rank and file officer on field of operation. The use of ordinal scale regression analysis is justified by the fact that the main objective of the study is to examine the role of ground radar technology with respect to its capabilities. Ordinal regression analysis will best establish such relationship.

CHAPTER FOUR

DATA PRESENTATION AND ANALYSIS

4.1 Data Presentation

The table 4.1 below (frequency matrix of respondent for cluster 1 to 6) shows that 72 copies of Ground radar technology and security surveillance of farmer - nomadic pastoralists in conflict zone Questionnaire (GRTSSFNPCZQ) where administered to personnel's of the Nigerian Police, Nigerian Army, Nigerian Air Force, Nigerian Navy, Department of State Services and Nigeria Security and Civil Defence Corps from three states (Plateau State, Benue State and Taraba State). 72 copies representing 100 percent were returned and all were valid. All the aforementioned agencies decline granting interview in respect to this research.

The total instrument therefore considered for this research and analyzed were 72 copies. This represent 100 percent of the total questionnaires (instrument). This was considered acceptable for this research work as represented in Table 4.1 below:

Table 4.1.1: Frequency matrix table of respondents for clusters 1 to 6

CLUSTER A	**Ground Radar Technology availability for control of farmer - nomadic pastoralist conflict.**				
	VGE	GE	A	LE	VLE
There is adequate number of Ground Radar Technology equipment in the farmer nomadic conflict zones	6	8	11	12	35
Ground Radar Technology equipment has unimpeded Intelligence gathering components	1	1	2	20	48
The real-time Surveillance and Interception embedded in the Ground Radar Technology is used in discouraging farmer - nomadic pastoralist in conflict zones are effective.	2	1	2	13	56
Ground Radar Technology has effective communication facilities to the appropriate parties.	46	9	10	4	3
In Ground Radar Technology there is Identity establishment and verification component to aid identity of Farmer and Nomadic Pastoralist.	0	54	4	14	54
Ground Radar Technology has the ability to eliminate challenges in Famer nomadic pastoralist conflict zones.	0	0	4	14	54
Ground Radar Technology has good security surveillance facilities.	0	0	3	11	58
The Ground Radar Technology on ground is adequate in performance.	4	4	8	17	39
CLUSTER B	**Ground Radar Technology significantly facilitate unimpeded Intelligence gathering of farmer - nomadic pastoralist in conflict zones in Nigeria.**				
	VGE	GE	A	LE	VLE
Intelligence gathering gives Security personnel knowledge of the entire security space they are required to protect.	37	21	7	5	2
Intelligence gathering provides operators insight into not only their perimeter but the area both within the perimeter and beyond the Farmer nomadic pastoralist conflict zones	47	15	4	6	0
Intelligence gathering equipment's can detect ground targets at up to a 12,000-meter radius thereby giving security operatives control over occurrences before they occur	51	16	2	3	0

Intelligence gathering help security operatives to know where the intruders are anywhere inside the "view" of the radar.	57	10	4	1	0
Intelligence gathering technology is reportedly capable of intercepting signals to security personnel about the warring farmers and nomadic pastoralist	54	14	2	1	1
Intelligence gathering Technology helps in tracking dangerous weapon from the warring farmer and nomadic pastoralist.	57	8	6	1	0
Intelligence gathering helps in providing invaluable data on whichever party is fighting.	50	16	5	0	1
Intelligence gathering can help security agencies gather reliable information about arms or equipment used by the fighters.	44	17	8	3	0

CLUSTER C	Ground Radar Technology **significantly assist Real-time Surveillance and Interception of farmer - nomadic pastoralist in conflict zones in Nigeria.**				
	SA	A	U	D	SD
Real-time Surveillance and interception can see long range and 360 degrees.	35	15	10	5	4
Real-time Surveillance and interception can be done remotely by mobile devices, acting as a force multiplier for existing personnel	24	27	18	2	1
Real-time Surveillance and interception increases the time available to respond to potential threats.	41	17	12	0	2
Real-time Surveillance and interception allow you to control your security zone by intercepting threats before they can complete their mission.	43	15	10	3	1
Real-time Surveillance and interception helps in capturing proliferation of cheap and easy to fly drone.	33	23	7	6	3
Ground Rader Technology has the capabilities of real time surveillance capturing of drone after the operator has targeted it.	48	17	3	3	1
Real-time Surveillance and interception brings capability in detection of conflict between farmer and nomadic pastoralist.	52	17	2	0	1
Real-time Surveillance and interception helps to spying, explosive dropping by the farmer and nomadic pastoralist.	46	15	6	3	1

CLUSTER D	**Ground Radar Technology significantly affect Secured Communication among law enforcement agencies of farmer - nomadic pastoralist in conflict zones in Nigeria.**				
	SA	A	U	D	SD
Secured Communication among law enforcement agencies will stop the farmers and nomadic pastoralist from carrying weapons	62	4	6	0	0
Secured Communication among law enforcement agencies will enable the security operatives to be proactive in preventing farmer - nomadic pastoralist conflicts	62	6	2	2	0
Secured Communication among law enforcement agencies will put fear in the farmers and thereby stop the rustling of cattle's of the nomadic pastoralist	25	16	12	5	14
Secured Communication among law enforcement agencies will put fear in the nomadic pastoralist and thereby checkmating their cows from destroying the crops of farmers	2	41	9	6	14
Secured Communication among law enforcement agencies helps limit the conflict between farmers and herders.	32	26	5	4	3
Secured Communication among law enforcement agencies provides an unrestricted real-time monitoring and report to the security heads and other governmental organizations.	61	4	1	2	0
Secured Communication among law enforcement agencies makes the location and tracking of law fugitives like farmer and nomadic pastoralist easier.	65	4	1	2	0
Secured Communication among law enforcement agencies helps in strengthening Nigeria's National security against conflict between farmer and nomadic pastoralist.	68	1	3	0	0

CLUSTER E	Ground Radar Technology **significantly affect the application of Identity establishment and verification of Farmer - Nomadic Pastoralist in conflict zones in Nigeria**				
	VGE	GE	A	LE	VLE
Real-time Surveillance and interception can see long range and 360 degrees.	0	0	16	46	10
Real-time Surveillance and interception can be done remotely by mobile devices, acting as a force multiplier	0	1	69	0	2

for existing personnel					
Real-time Surveillance and interception increases the time available to respond to potential threats.	0	2	51	0	19
Real-time Surveillance and interception allow you to control your security zone by intercepting threats before they can complete their mission.	65	3	3	0	1
Real-time Surveillance and interception helps in capturing proliferation of cheap and easy to fly drone.	27	23	20	0	2
Ground Rader Technology has the capabilities of real time surveillance capturing of drone after the operator has targeted it.	2	25	10	4	2
Real-time Surveillance and interception brings capability in detection of conflict between farmer and nomadic pastoralist.	1	55	10	4	2
Real-time Surveillance and interception helps to spying, explosive dropping by the farmer and nomadic pastoralist.	30	40	0	0	2
CLUSTER F	**What are the challenges of using Ground Radar Technology in security surveillance of farmer - nomadic pastoralist in conflict zones in Nigeria?**				
	VGE	GE	A	LE	VLE
Lack of manpower	0	18	54	0	0
Ground Radar Technology can be breached	0	0	0	56	16
Poor finance to security operatives	0	71	1	0	0
Expensive to install and maintain	68	3	1	0	0
Bad weather conditions	0	0	1	39	32
Others (Please specify)	0	0	0	0	0

SOURCE: ***Field Survey*****, 2019**

Table 4.1.2: Frequency table of organisations in farmer - nomadic pastoralist in conflict zones in Nigeria.

Organisation

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	OSH Jos	24	33.3	33.3	33.3
	OWS Benue	24	33.3	33.3	66.7
	OWS Taraba	24	33.3	33.3	100.0
	Total	72	100.0	100.0	

SOURCE: *Field Survey*, 2019

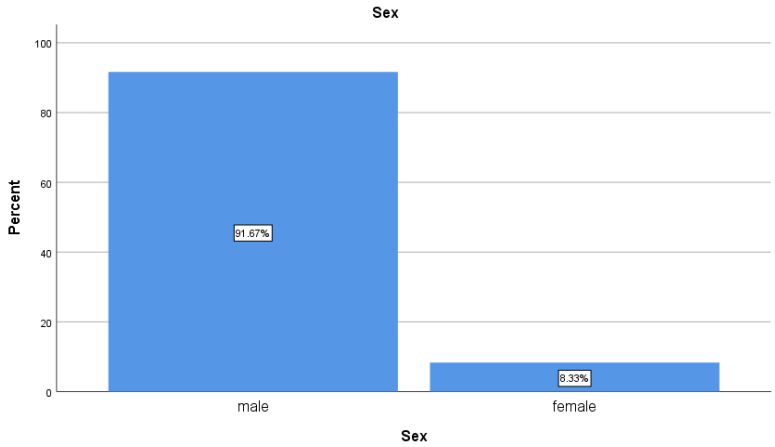
The table 4.2 present the organisations selected for the research in the conflict zones. From the result, it was observed that 24(33.3%) of the respondents were from OSH Jos Plateau State, it was also observed that 24(33.3%) of the respondents were from OWS Benue State and 24(33.3%) respondents were from OWS Taraba State, bringing the cumulative percent to 100%.

Table 4.1.3: Frequency table and chat of Sex of respondents in organisations in farmer - nomadic pastoralist in conflict zones in Nigeria.

Sex

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	male	66	91.7	91.7	91.7
	female	6	8.3	8.3	100.0
	Total	72	100.0	100.0	

SOURCE: *Field Survey*, 2019

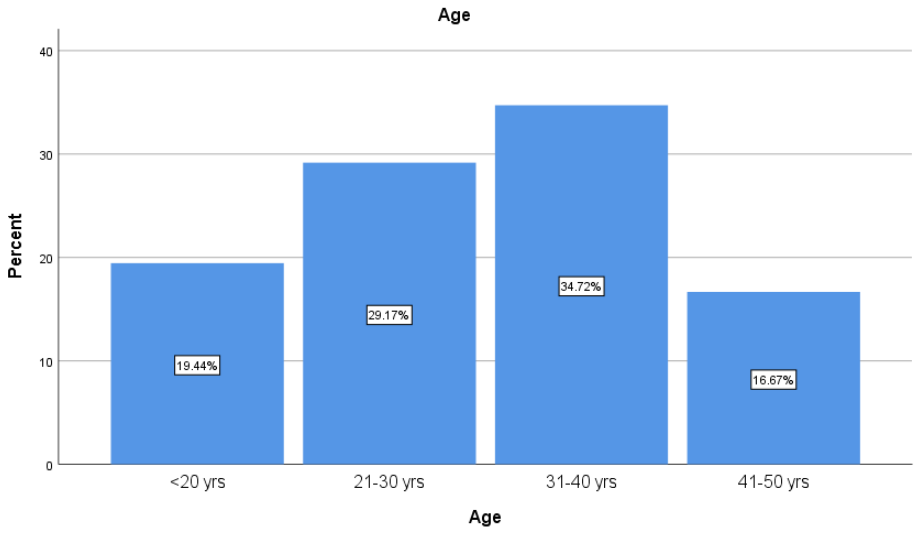


The table 4.1.3 present the sex classification for male and female in the organisation in the conflict zones. From the result, it was observed that 66 (91.7%) of the respondents were male while 6 (8.3%) of the respondents are female, bringing the cumulative percent to 100%.

Table 4.1.4: Frequency table and chat of Age of respondents in organisations in farmer - nomadic pastoralist in conflict zones in Nigeria.

Age

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	<20 yrs	14	19.4	19.4	19.4
	21-30 yrs	21	29.2	29.2	48.6
	31-40 yrs	25	34.7	34.7	83.3
	41-50 yrs	12	16.7	16.7	100.0
	Total	72	100.0	100.0	



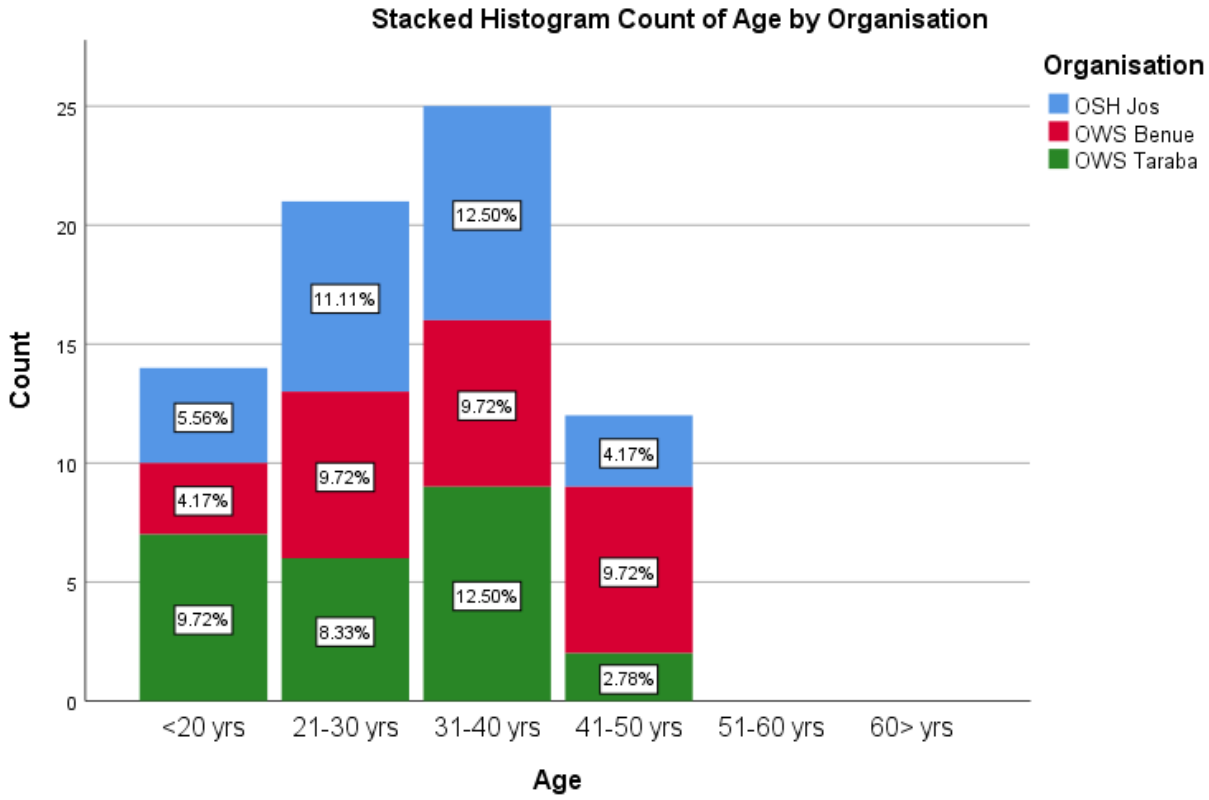
The table 4.1.4 present the Age categorization in the three organisation of the conflict zones in Nigeria. From the result, it was observed that 14 (19.4%) of the respondents were below the age of twenty (20 years), 21(29.2%) of the respondents are between 21 and 30 year of age, 25 (34.7%) of the respondents are between 31 and 40 year of age and 12 (16.7%) of the respondents are between 41 to 50 years of age, bringing the cumulative percent to 100%.

Table 4.1.5: Frequency table and chat for Organisations and Age cross tabulation of respondents in farmer - nomadic pastoralist in conflict zones in Nigeria.

Organisation * Age Crosstabulation

Count

		Age				
		<20 yrs	21-30 yrs	31-40 yrs	41-50 yrs	Total
Organisation	OSH Jos	4	8	9	3	24
	OWS Benue	3	7	7	7	24
	OWS Taraba	7	6	9	2	24
Total		14	21	25	12	72



The table 4.1.5 present the organisations and age cross tabulation in the conflict zones. From the result, it was observed that OSH Jos plateau State has 4 respondent under 20 years of age at (5.56%), and 3 respondent between 41 and 50 years at (4.7%), while OWS of Benue State has 3 respondent under 20 years of age at (4.17%) and 7

respondent between 41 – 50 years of age at (9.72%) and OWS of Taraba State has 7 respondent under 20 years of age and 2 respondent between 41 to 50 years of age at (2.78%). OWS Taraba ha the largest number of young officers and the lowest number of older officers.

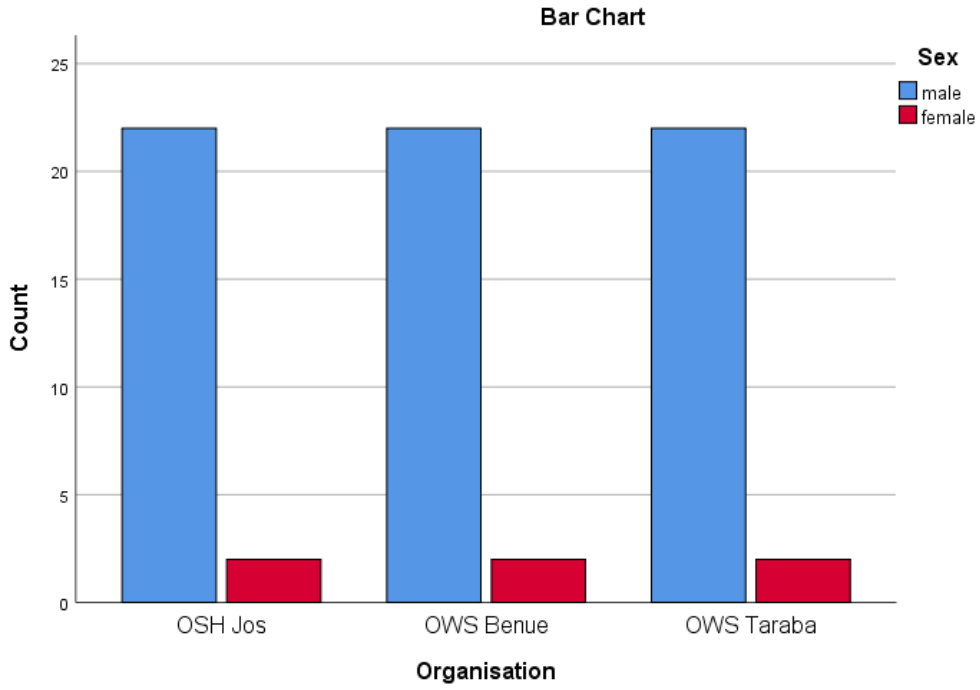
Table 4.1.6: Frequency table and chat for Organisations and Sex cross tabulation of respondents in farmer - nomadic pastoralist in conflict zones in Nigeria.

Organisation * Sex Crosstabulation

Count

		Sex		
		male	female	Total
Organisation	OSH Jos	22	2	24
	OWS Benue	22	2	24
	OWS Taraba	22	2	24
Total		66	6	72

SOURCE: ***Field Survey*****, 2019**



The table 4.1.6 present the organisation and sex distribution in the conflict zones. From the result, it was observed that OSH Jos plateau State has 22 male respondents and 2 female respondents while OWS Benue State has 22 male and 2 female respondent and OWS Taraba State has 22 male and 2 female respondent respectively, bringing the total number of respondent to 72.

4.2 Data Analysis and Results

Analysis of Ground Radar Technology in Farmer-nomadic Pastoralist Conflict in Nigeria.

4.2.1 Is Ground Radar Technology Equipment available in farmer – nomadic pastoralist conflict in Nigeria? Table 4.2.1 was used to answer the research question.

Table 4.2.1
Descriptive analysis of the extent of the availability of Ground Radar Technology equipment in farmer nomadic pastoralist conflict

Responses	Freq	%	Ranking
Very Little Extent	67	93.06	1st**
Little Extent	5	6.94	2nd*
TOTAL	72	100%	

** The greatest extent
* The least extent
Source: Field Survey 2019

The table 4.2.1 presents the extent of the availability of Ground Radar Technology equipment in the conflict zones. From the result, it was observed that 67(93.06) of the respondents affirmed very little extent of

availability of Ground Radar Technology equipment while 5(6.94%) of the respondents affirmed little extent of the equipment.

Hypothesis Testing

4.2.1.2 Ground Radar Technology are not adequately available in number in farmer-nomadic pastoralist conflict zones in Nigeria. In order to answer the hypothesis, One Sample t-test was used to analyze the data, (see table 4.2.1.2).

Table 4.2.1.2
One sample t-test analysis of the availability of Ground Rader Technology in conflict

Responses	Observed mean / Expected mean	Observed SD / Expected SD	t
Observed	**20**	**1.87**	
Expected	**12.73**	**1.74**	**61.96***

***Significant at 0.05 level; df = 71; N= 72; critical t-value = 2.000**
Source: Field Survey 2019

As shown in Table 4.2.1.2 the calculated t-value is 61.96. This value was tested at 0.05 level with 71 degree of freedom. The obtained t-value (61.96) is greater than the critical t-value (2.000). Hence, the result was not significant. The result therefore means that there is no significant of availability of Ground Radar Technology equipment in the conflict zones.

4.2.2 To what extent will Ground Radar Technology facilitate in unimpeded Intelligence gathering of farmer - nomadic pastoralist in conflict zones in Nigeria? Table 4.2.2 was used to answer the research question.

Table 4.2.2

Descriptive analysis of the extent to which Ground Radar Technology will facilitate in unimpeded Intelligence gathering of farmer - nomadic pastoralist in conflict in Nigeria.

Responses	Freq	%	Ranking
Very great extent	28	38.89	1st**
Great extent,	21	29.17	2nd
Average	11	15.28	3rd
Little extent	8	11.11	4th
Very little extent	4	5.56	5th*
TOTAL		72	100%

** The greatest extent
* The least extent
Source: Field Survey 2019

The table 4.2.2 shows the extent to which Ground Radar Technology will facilitate in unimpeded Intelligence gathering of farmer - nomadic pastoralist in conflict zones in Nigeria. From the result, it was observed that 28(38.89) % of the respondents affirmed that very great extent while 4(5.56) % of the respondent affirmed very little extent. The result therefore means that Ground Radar Technology will facilitate in unimpeded

Intelligence gathering of farmer - nomadic pastoralist in conflict zones in Nigeria to a very great extent when adequately installed and used.

Hypothesis Testing

4.2.2.1 The null hypothesis states that Ground Radar Technology do not significantly facilitate unimpeded Intelligence gathering of farmer - nomadic pastoralist in conflict zones in Nigeria. In order to test the hypothesis regression analysis was performed on the data, (see table 4.2.2.1).

Table 4.2.2.1

Regression Analysis of how ground radar technology can facilitate unimpeded intelligence gathering of farmer-nomadic pastoralist in conflict in Nigeria.

Model	R	R-Square	Adjusted R Square	Std. error of the Estimate	R Square Change
1	0.87[a]	0.75	0.75	1.50	0.75

***Significant at 0.05 level; df = 70; N= 72; critical R-value = 0.235**
Source: Field Survey 2019

The table shows that the calculated R-value 0.87 was greater than the critical R-value of 0.235 at 0.5 alpha level with 70 degree of freedom. The R-Square value of 0.75 predicts 75% of how ground radar technology can facilitate unimpeded intelligence gathering of farmer-nomadic pastoralist in conflict zones in Nigeria. This rate of percentage is highly positive and therefore means that Ground Radar Technology

significantly facilitate unimpeded Intelligence gathering of farmer - nomadic pastoralist in conflict zones in Nigeria. It was also deemed necessary to find out the extent of the variance of each case of independent variable (Ground Radar Technology) can perform the unimpeded Intelligence gathering of farmer - nomadic pastoralist in conflict zones in Nigeria as responded by each respondent (see table 4.2.2.2)

Table 4.2.2.2

Analysis of variance of how ground radar technology can facilitate unimpeded intelligence gathering of farmer-nomadic pastoralist in conflict in Nigeria.

Model	Sum of Squares	Df	Mean Square	F	Sig.
Regression	471.19	1	471.19	210.35	.000b
Residual	156.80	70	2.24		
Total	627.99	71			

Source: Field Survey 2019

The above table presents the calculated F-value as (210.35) and the P-value as (000). Being that the P-value (000) is below the probability level of 0.05, the result therefore means that Ground Radar Technology can significantly facilitate unimpeded Intelligence gathering of farmer - nomadic pastoralist in conflict zones in Nigeria.

4.2.3 How will Ground Radar Technology assist in Real-time Surveillance and Interception of farmer - nomadic pastoralist in conflict zones in Nigeria? Table 4.2.3 was used to answer the research question.

Table 4.2.3
Descriptive analysis of the extent to which Ground Radar Technology will assist in Real-time Surveillance and Interception of farmer - nomadic pastoralist in conflict in Nigeria.

Responses	Freq	%	Remark
Very great extent	21	29.17	1st**
Great extent,	19	26.39	2nd
Average	15	20.83	3rd
Little extent	12	16.67	4th
Very little extent	5	6.94	5th*
TOTAL		72	100%

** The greatest extent
** The least extent
Source: Field Survey 2019

Table 4.2.3 shows the extent to which Ground Radar Technology will assist in Real-time Surveillance and Interception of farmer - nomadic pastoralist in conflict zones in Nigeria. From the result, it was observed that 21(29.17%) of the respondents affirmed very great extent, while 5(6.96%) affirmed very little extent. The result therefore means that Ground Radar Technology will assist in Real-time Surveillance and Interception of farmer - nomadic pastoralist in conflict zones in Nigeria.

Hypothesis Testing

4.2.3.1 The null hypothesis states that Ground Radar Technology do not significantly assist Real-time Surveillance and Interception of farmer - nomadic pastoralist in conflict zones in Nigeria. In order to test the hypothesis regression analysis was performed on the data, (see table 4.2.3.1).

Table 4.2.3.1

Regression Analysis of how ground radar technology can assist Real-time Surveillance and Interception of farmer - nomadic pastoralist in conflict zones in Nigeria.

Model	R	R-Square	Adjusted R Square	Std. error of the Estimate	R Square Change
1	.81a	0.65	0.65	1.76	0.65

***Significant at 0.05 level; df = 70; N= 72; critical R-value = 0.235**
Source: Field Survey 2019

The table shows that the calculated R-value 0.81 was greater than the critical R-value of 0.235 at 0.5 alpha level with 70 degree of freedom. The R-Square value of 0.65 predicts 65% of how ground radar technology can assist Real-time Surveillance and Interception of farmer - nomadic pastoralist in conflict zones in Nigeria. This rate of percentage is highly positive and therefore means that Ground Radar Technology can significantly assists Real-time Surveillance and Interception of farmer - nomadic pastoralist in conflict zones in Nigeria. It was also deemed necessary to find out the extent of the variance of

each case of independent variable (Ground Radar Technology) can perform the real-time Surveillance and Interception of farmer - nomadic pastoralist in conflict zones in Nigeria) as responded by each respondent (see table 4.2.3.2).

4.2.4 What are the effects of using Ground Radar Technology to Secure Communication among law enforcement agencies in farmer - nomadic pastoralist conflict in Nigeria? Table 4.2.4 was used to answer the research question.

Table 4.2.4
Analysis of the extent of the effects of using Ground Radar Technology to Secure Communication among law enforcement agencies in farmer - nomadic pastoralist conflict in Nigeria

Responses	Freq	%	Remark
Very great extent	32	44.44	1st**
Great extent,	25	34.72	2nd
Average	9	12.5	3rd
Little extent	4	5.56	4th
Very little extent	2	2.78	5th *
TOTAL		72	100%

** The greatest extent
** The least extent
Source: Field Survey 2019

Table 4.2.4 shows the extent of the effects of using Ground Radar Technology to Secure Communication among law enforcement agencies in farmer - nomadic pastoralist conflict in Nigeria. From the result, it was observed that 32(44.44) % of the respondents affirmed very great

extent while 2 (2.78%) of the respondents affirmed very little extent. The result therefore means that there is significant effect of using Ground Radar Technology to Secure Communication among law enforcement agencies in farmer - nomadic pastoralist conflict zones in Nigeria.

Hypothesis Testing

4.2.4.1 The null hypothesis states that Ground Radar Technology do not significantly affect Secure Communication among law enforcement agencies of farmer - nomadic pastoralist in conflict in Nigeria. In order to test the hypothesis regression analysis was performed on the data, (see table 4.2.4.1).

Table 4.2.4.1

Regression Analysis of how ground radar technology can affect Secure Communication among law enforcement agencies of farmer - nomadic pastoralist in conflict in Nigeria.

Model	R	R-Square	Adjusted R Square	Std. error of the Estimate	R Square Change
1	0.78a	0.61	0.60	2.01	0.61

***Significant at 0.05 level; df = 70; N= 72; critical R-value = 0.235**
Source: Field Survey 2019

The table shows that the calculated R-value 0.78 was greater than the critical R-value of 0.235 at 0.5 alpha level with 70 degree of freedom. The R-Square value of 0.61 predicts 61% of how ground radar technology can affect Secure Communication among law enforcement agencies of farmer - nomadic pastoralist in conflict zones in Nigeria.

This rate of percentage is highly positive and therefore means that Ground Radar Technology can significantly affect Secure Communication among law enforcement agencies of farmer - nomadic pastoralist in conflict zones in Nigeria. It was also deemed necessary to find out the extent of the variance of each case of independent variable (Ground Radar Technology) can perform real-time Surveillance and Secure Communication among law enforcement agencies of farmer - nomadic pastoralist in conflict zones in Nigeria) as responded by each respondent (see table 4.2.4.2).

Table 4.2.4.2
Analysis of variance of how ground radar technology can affect Secure Communication among law enforcement agencies of farmer - nomadic pastoralist in conflict in Nigeria

Model	Sum of Squares	Df	Mean Square	F	Sig.
Regression	435.89	1	435.89	107.40	.000[b]
Residual	284.11	70	4.06		
Total	720.00	71			

Source: Field Survey 2019

The above table presents the calculated F-value as (107.40) and the P-value as (000). Being that the P-value (000) is below the probability level of 0.05, the result therefore means that Ground Radar Technology can significantly affect Secure Communication among law enforcement agencies of farmer - nomadic pastoralist in conflict in Nigeria.

4.2.5 To what extent will the application of Ground Radar Technology assist in

identity establishment and verification of farmer - nomadic pastoralist in conflict zones in Nigeria? Table 4.2.5 was used to answer the research question.

Table 4.2.5
Descriptive analysis of the extent to which the application of Ground Radar Technology assist in identity establishment and verification of farmer - nomadic pastoralist in conflict in Nigeria.

Responses	Freq	%	Remark
Very great extent	24	33.33	1st**
Great extent,	19	26.39	2nd
Average	13	18.06	3rd
Little extent	10	13.89	4th
Very little extent	6	8.33	5th*
TOTAL		72	100%

** The greatest extent
** The least extent
Source: Field Survey 2019

Table 4.2.5 shows the extent to which the application of Ground Radar Technology will assist in identity establishment and verification of farmer - nomadic pastoralist in conflict zones in Nigeria. From the result, it was observed that 24(33.33%) of the respondents affirmed very high extents to which the application of Ground Radar Technology will assist in identity establishment and verification of farmer - nomadic pastoralist in conflict zones in Nigeria, while 6(8.33%) affirmed very little. The result therefore means that there is high extent to which the application of Ground Radar Technology will assist in identity

establishment and verification of farmer - nomadic pastoralist in conflict in Nigeria.

Hypothesis Testing

4.2.5.1 The null hypothesis states that Ground Radar Technology do not significantly affect the application of Identity establishment and verification of Farmer - Nomadic Pastoralist in conflict in Nigeria. In order to test the hypothesis regression analysis was performed on the data, (see table 4.2.5.1).

Table 4.2.5.1

Regression Analysis of how ground radar technology can affect the application of Identity establishment and verification of Farmer - Nomadic Pastoralist in conflict zones in Nigeria

Model	R	R-Square	Adjusted R Square	Std. error of the Estimate	R Square Change
1	0.82[a]	0.68	0.67	1.73	0.68

***Significant at 0.05 level; df = 70; N= 72; critical R-value = 0.235**

Source: Field Survey 2019

The table shows that the calculated R-value 0.82 was greater than the critical R-value of 0.235 at 0.5 alpha level with 70 degree of freedom. The R-Square value of 0.68 predicts 68% of how ground radar technology can affect the application of Identity establishment and verification of Farmer - Nomadic Pastoralist in conflict zones in Nigeria. This rate of percentage is highly positive and therefore means that Ground Radar Technology can significantly affect the application of

Identity establishment and verification of Farmer - Nomadic Pastoralist in conflict zones in Nigeria. It was also deemed necessary to find out the extent of the variance of each case of independent variable (Ground Rader Technology and the application of Identity establishment and verification of Farmer - Nomadic Pastoralist in conflict in Nigeria.) as responded by each respondent (see table 4.2.5.2).

Table 4.2.5.2

Analysis of variance of how ground radar technology can affect the application of Identity establishment and verification of Farmer - Nomadic Pastoralist in conflict in Nigeria.

Model	Sum of Squares	Df	Mean Square	F	Sig.
Regression	433.37	1	433.37	145.56	.000[b]
Residual	208.41	70	2.98		
Total	641.78	71			

The above table presents the calculated F-value as (145.56) and the P-value as (000). Being that the P-value (000) is below the probability level of 0.05, the result therefore means that Ground Radar Technology can significantly affect the application of identity establishment and verification of Farmer - Nomadic Pastoralist in conflict in Nigeria.

4.2.6 What are the challenges of using Ground Radar Technology in security surveillance of farmer - nomadic pastoralist in conflict in Nigeria? Table 4.2.6 was used to answer the research question.

Table 4.2.6
Descriptive analysis of the challenges of using Ground Radar Technology in security surveillance of farmer - nomadic pastoralist in conflict in Nigeria

Responses.	FREQ	%	Remark
Lack of manpower	7	9.72	5th*
Ground Radar Technology can be breached	15	20.83	3rd
Poor finance to security operatives	17	23.61	2nd
Expensive to install and maintain	19	26.39	1st**
Bad weather conditions	14	19.44	4th
Total	72	100%	

**** The greatest challenge**
***** The least challenge**
Source: Field Survey 2019

Table 4.2.6 presents the challenges of using Ground Radar Technology in security surveillance of farmer - nomadic pastoralist in conflict zones in Nigeria. From the result it was observed that expensive cost of installation (procurement) and maintenance was the greatest challenge with 19 (26.39%), while the least challenge was the least "Lack of Manpower" with 7 (9.72%).

Hypothesis testing

4.2.6 The null hypothesis states that Ground Radar Technology do not significantly have challenges in security surveillance of Farmer - Nomadic Pastoralist in conflict in Nigeria. In order to answer the hypothesis, One Sample t-test was used to analyze the data, (see table 4.2.6).

Table 4.2.6
One sample t-test analysis of the challenges Ground Rader Technology will have in security surveillance of farmers – nomadic pastoralist in conflict in Nigeria.

Variables	Exp X / Obs. X	Exp SD / Obs SD	t
Observed	**20**	**1.87**	**82.30***
Expected	**29.17**	**3.00**	

***Significant at 0.05 level; df = 70; N= 72; critical t-value = 2.000**
Source: Field Survey 2019

As shown in Table 4.2.16 the calculated t-value is 82.30. This value was tested at 0.05 level with 70 degree of freedom. The obtained t-value (82.30) is greater than the critical t-value (2.000). Hence, the result was significant. The result therefore means that Ground Radar Technology will significantly have challenges in security surveillance of Farmer - Nomadic Pastoralist in conflict in Nigeria.

4.3 Discussion of Findings

Availability of Ground Radar Technology equipment: the result implies that there is no significant availability of Ground Radar Technology equipment in the conflict zones. The result therefore was in agreement with the research findings of Williams (2005) who noticed that due to the inability of government to put in place proper deterrence measures the conflict has degenerated. The conflict had been primarily about resource use, damage to crops, blocking of transhumant corridors, farming along the valleys and stream/river banks and uncomplimentary agricultural policies by government, he further said that the conflict has assumed a dangerous dimension with the infusion of ethnic, religious and political factors into it. Cattle rustling, availability of dangerous weapons, intra-pastoralist conflicts, mercenary elements and dangerous drugs has all added to the combustion but the security agencies are still battling to reduce the attacks on lives and properties. Introducing technology such as ground radar technology will reduce the menace. It also agrees with the findings of Fein (2014) which stated that Ground Radar Technology equipment is reportedly capable of intercepting signals, tracking ballistic missiles and even monitoring U.S. space launches, providing invaluable data to whichever party is operating it. The insignificance of the result caused the null hypotheses to be accepted while the alternative one was rejected. Ground radar

technology if adequately made available will bring to a stop the conflict between the farmers and nomadic-pastoralist in conflict zones in Nigeria.

On the aspect of facilitating unimpeded Intelligence gathering, the result implies that Ground Radar Technology significantly facilitate unimpeded Intelligence gathering of farmer - nomadic pastoralist in conflict zones in Nigeria. The result therefore was in agreement with the research findings of Romano (2014) who in his study posit that the Soviet Union used a number of radar-equipped ocean reconnaissance satellites (RORSAT), which used strong radar systems, powered by an onboard nuclear reactor to gather intelligence and to visualize vessels. The significance of the result caused the null hypotheses to be rejected while the alternative one was accepted. It is clear that the security office in the conflict zone are fully in the know that the technology has the capability to facilitate unimpeded intelligence gathering, therefore the government you should make the technology available to stop the conflict.

Ground Radar Technology can significantly assist Real-time surreptitious Surveillance and Interception of farmer - nomadic pastoralist in conflict zones in Nigeria. The result therefore was in agreement with the research findings of Alekhya Sai Punnamaraju (2013) that states that the result of the experiment with Ground Radar

Technology proved that it is all because there has been an understanding that UAVs can create major threats beyond the conflict areas. Sometimes, camera-equipped UAVs surreptitiously invade people's privacy. It also agrees with that of Gilad Beeri (2016) that state that UAV can intercept data. The significance of the result caused the null hypotheses to be rejected while the alternative one was accepted.

Ground Radar Technology also significantly affect Secure Communication among law enforcement agencies of farmer - nomadic pastoralist in conflict zones in Nigeria. The result therefore was in agreement with the research findings of Leonardo (2018) that proved that in-house laboratories devoted to specific areas of applied research, promotes the effective integration of new, innovative components within our existing radar portfolio and the new developments for promotion of communication. According to him, a key element of this strategy is the design of the most advanced fully AESA Kronos family radar, fixed faces, staring and rotating – X, C and L band, based on the totally-owned GaAs and GaN technologies. The significance of the result caused the null hypotheses to be rejected while the alternative one was accepted.

Ground Radar Technology also significantly affect the application of Identity establishment and verification of Farmer - Nomadic Pastoralist in conflict zones in Nigeria. The result therefore was in agreement with

the research findings of Leighton & Martin (2014) form his study of the RCS for small and large commercial vessels in the lower end of the HF band (3-5 MHz) using Numerical Electromagnetics Code (NEC) and trial data from the HFSWR at Cape Race referring to those Newfoundland, small displacements of -1000 ton and large vessels referring to cargo-container ships with displacements of several tens of groups of ships routinely tracked by kilotons and proving that these are the HFSWR, A generic small vessel is modeled after Teleost, a 2405.ton Canadian coast guard ship (CCGS). According to him, teleost was used as a control target in a trial to provide measurements of the target signal at selected aspects and the ship sailed outbound and then inbound along the boresight to provide measurements at stem-on and bow-on aspects. The significance of the result caused the null hypotheses to be rejected while the alternative one was accepted.

The result implies that that Ground Radar Technology significantly have challenges in security surveillance of Farmer - Nomadic Pastoralist in conflict zones in Nigeria. The result therefore was in agreement with the research findings of David (2000) who identified some of the challenges to be atmospheric effects, as rain and other forms of precipitation can cause echo signals that mask the desired target echoes and that the decrease in density of the Earth's atmosphere with increasing altitude causes radar waves to bend as they propagate through

the atmosphere. It also agreed with Skolnik, (2001) who saw interference as a challenge due to the fact signals from nearby radars and other transmitters can be strong enough to enter a radar receiver and produce spurious responses even though well-trained operators are not often deceived by interference but on the ground of finding it a nuisance and interference is not as easily ignored by automatic detection and tracking systems. The significance of the result caused the null hypotheses to be rejected while the alternative one was accepted. It is also clear from the analysis, that the cost of equipment is the major challenge from the perspective of farmer nomadic-pastoralist conflict in Nigeria.

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Summary

The study was conducted in order to examine the roles of Ground Radar Technology with respect to security surveillance of farmer - nomadic pastoralist in conflict zones in Nigeria. In order to carry out the study six specific objectives were drawn from which six null hypotheses and six research questions were formulated.

The specific objectives covered include the examination of the availability of Ground Radar Technology equipment in the warring zones, Ground Radar technology's application in Intelligence gathering of farmer - nomadic pastoralist in conflict zones in Nigeria, Ground Radar technology's assistance in Real-time Surveillance and Interception of farmer - nomadic pastoralist in conflict zones in Nigeria, Ground Radar Technology in Securing Communication among law enforcement agencies in farmer - nomadic pastoralist conflict zones in Nigeria, Ground Radar Technology assisting Identity establishment and verification of farmer - nomadic pastoralist in conflict zones in Nigeria and the challenges of Ground Radar Technology in security surveillance of farmer - nomadic pastoralist in conflict zones in Nigeria.

The related literature were reviewed based on the variables of the above specific objectives. The review was done with the use of past research work and experts opinions, which were derived from journals, magazines and textbooks. Exploratory research design was used in the methodology of this work. This allowed for the use of "Ground radar technology and security surveillance of farmer - nomadic pastoralists in conflict zone Questionnaire (GRTSSFNPCZQ)" which was adopted by the researcher.

This was obtained through stratified random sampling technique used in selecting the respondents. Data collected were subjected to statistical analysis and interpretation. From the result of the data analysis, it was observed that there is significant very low extent of the availability of Ground Radar Technology equipment in the conflict zones. It was also observed that Ground Radar Technology equipment can significantly facilitate unimpeded Intelligence gathering of farmer - nomadic pastoralist in conflict zones in Nigeria; Ground Radar Technology can significantly assist Real-time Surveillance and Interception of farmer - nomadic pastoralist in conflict zones in Nigeria and that Ground Radar Technology can significantly Secure Communication among law enforcement agencies of farmer - nomadic pastoralist in conflict zones in Nigeria. It was also observed that Ground Radar Technology significantly can affect the application of Identity establishment and

verification of Farmer - Nomadic Pastoralist in conflict zones in Nigeria and finally, Ground Radar Technology significantly has many challenges in security surveillance of Farmer - Nomadic Pastoralist in conflict zones in Nigeria.

5.2 Conclusion

Based on the findings of the research work, it was concluded that there are no significant availability of Ground Radar Technology equipment in the conflict zones and that Ground Radar Technology if adequately installed and utilize can significantly facilitate unimpeded Intelligence gathering, Real-time Surveillance and Interception, Securing Communication among law enforcement agencies, affect the application of Identity establishment and verification of Farmer - Nomadic Pastoralist in conflict zones in Nigeria. Finally, Ground Radar Technology is expensive to install, which is a major challenge in security surveillance of Farmer - Nomadic Pastoralist in conflict zones in Nigeria.

Ground Radar Technology has the capacity from its capability to stop the exiting conflict between the Farmers - Nomadic Pastoralist in conflict zones in Nigeria. The less availability of Ground Radar Technology means conflict can go undetected, it will impede on intelligence gathering, real-time surveillance and interception, secure communication among law enforcement agencies and affect identity

establishment and verification of Famer-Nomadic Pastoralist in conflict zones in Nigeria. Therefore, there is need for government and the security agencies to pay attention to this technology and adequately deploy in the Farmer-Nomadic Pastoralist conflict zone of Nigeria.

5.3 Recommendations

The following recommendations are put forward:

1. The Nigerian government should endeavour to adopt and install Ground Radar Technology adequately to monitor, minimize or completely stop the issues of Farmer-Nomadic Pastoralist conflict and insecurity in Nigeria.
2. Government should ensure that personnel in the Security Agencies are well trained to build expertise in using Ground Radar Technology for security surveillance of farmer-nomadic pastoralists conflict in Nigeria.
3. Security Agencies must take advantage of the capacity and capability of Ground Radar Technology when installed to facilitate unimpeded intelligence gathering, real-time surveillance, communication, identity establishment and verification of farmer - nomadic pastoralist in conflict zones in Nigeria. The adoption of Ground Radar Technology will stop the conflict and bring development in the conflict zones of Nigeria.

5.4 Limitation of the Study

The major limitation of the study was high level of insecurity in the study areas. However, to get the cooperation of respondent the commanders of the various task forces in the study areas provided tight security escorts all through the study areas (Plateau, Benue and Taraba State Respectively).

5.5 Suggestion for Further Studies

The farmer-nomadic pastoralist conflict in the study areas (Plateau, Benue, and Taraba States) has being in existence for not less than eight years, there by degenerating into communal clashes and religious crises. It is therefore suggested that further research should focus on the use of technology for security surveillance of farmer - nomadic pastoralist conflict Nigeria from the perspective of the citizens of each of the state in question.

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Appendix I

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Keffi

Dear Respondent,

I am a post graduate student of the above University conducting a study on Ground Radar Technology and Security Surveillance in Farmer Nomadic Pastoralist in Conflict Zone of Nigeria. You are therefore requested to respond honestly to the items of this questionnaire as the information supplied by you will be treated with high level of confidentiality and used for academic purpose only.

Thank you,

Yours faithfully

EBUTE, Joel Ugbede'ojo
NSU/GDP/SSS/0034/17/18

Appendix II

GROUND RADAR TECHNOLOGY IN SECURITY SURVEILLANCE OF FARMER - NOMADIC PASTORALISTS IN CONFLICT ZONE QUESTIONNAIRE (GRTSSFNPCZQ)

SECTION A: DEMOGRAPHICS

1. Organisation:

OPERATION SAVE HAVEN PLATEAU STATE	☐
OPERATION WHIRL STROKE BENUE STATE	☐
OPERATION WHIRL STROKE TARABA STATE	☐

2. Sex:

Male	☐
Female	☐

3. Age:

≤ 20 years	☐
21 – 30 years	☐
31 – 40 years	☐
41 – 50 years	☐
51 – 60 years	☐
≥ 60 years	☐

SECTION B

Cluster 1: Ground Radar Technology availability for control of farmer - nomadic pastoralist conflict.

INSTRUCTION: You are presented with five (5) options as follows: VGE (Very great extent), GE (Great extent), A (Average), LE (Little extent) and VLE (Very little extent). Please tick (√) one cell that is most applicable to you for each statement.

S/N	ITEMS	VGE	GE	A	LE	VLE
A1.	There is adequate number of Ground Radar Technology equipment in the farmer nomadic conflict zones					
A2.	Ground Radar Technology equipment has unimpeded Intelligence gathering components					
A3.	The real-time Surveillance and Interception embedded in the Ground Radar Technology is used in discouraging farmer - nomadic pastoralist in conflict zones are effective.					
A4.	Ground Radar Technology has effective communication facilities to the appropriate parties.					
A5	In Ground Radar Technology there is Identity establishment and verification component to aid identity of Farmer and Nomadic Pastoralist.					
A6	Ground Radar Technology has the ability to eliminate challenges in Famer nomadic pastoralist conflict zones.					
A7	Ground Radar Technology has good security surveillance facilities.					

A8	The Ground Radar Technology on ground is adequate in performance.					

Cluster 2: Ground Radar Technology do not significantly facilitate unimpeded Intelligence gathering of farmer - nomadic pastoralist in conflict zones in Nigeria.

INSTRUCTION: You are presented with five (5) options as follows: VGE (Very great extent), GE (Great extent), A (Average), LE (Little extent) and VLE (Very little extent). Please tick (√) one cell that is most applicable to you for each statement.

S/N	**ITEMS**	**VGE**	**GE**	**A**	**LE**	**VLE**
B1.	Intelligence gathering gives Security personnel knowledge of the entire security space they are required to protect.					
B2.	Intelligence gathering provides operators insight into not only their perimeter but the area both within the perimeter and beyond the Farmer nomadic pastoralist conflict zones					
B3.	Intelligence gathering equipment's can detect ground targets at up to a 12,000 meter radius thereby giving security operatives control over occurrences before they occur					
B4.	Intelligence gathering help security operatives to know where the intruders are anywhere inside the "view" of the radar.					
B5	Intelligence gathering technology is reportedly capable of intercepting signals to security personnel about the warring farmers and nomadic pastoralist					
B6	Intelligence gathering Technology helps in tracking dangerous weapon from the warring farmer and nomadic pastoralist.					

B7	Intelligence gathering helps in providing invaluable data on whichever party is fighting.					
B8	Intelligence gathering can help security agencies gather reliable information about arms or equipment used by the fighters.					

Cluster 3. Ground Radar Technology do not significantly assist Real-time Surveillance and Interception of farmer - nomadic pastoralist in conflict zones in Nigeria.

INSTRUCTION: You are presented with five (5) options as follows: SA (Strongly Agree), A (Agree), U (Undecided), D (Disagree) and SD (Strongly Disagree). Please tick (√) one cell that is most applicable to you for each statement.

S/N	ITEMS	SA	A	U	D	SD
C1.	Real-time Surveillance and interception can see long range and 360 degrees.					
C2.	Real-time Surveillance and interception can be done remotely by mobile devices, acting as a force multiplier for existing personnel					
C3.	Real-time Surveillance and interception increases the time available to respond to potential threats.					
C4.	Real-time Surveillance and interception allow you to control your security zone by intercepting threats before they can complete their mission.					
C5.	Real-time Surveillance and interception helps in capturing proliferation of cheap and easy to fly drone.					
C6.	Ground Rader Technology has the capabilities of real time surveillance capturing of drone after the operator has targeted it.					
C7.	Real-time Surveillance and interception brings capability in detection of conflict between farmer					

	and nomadic pastoralist.					
C8.	Real-time Surveillance and interception helps to spying, explosive dropping by the farmer and nomadic pastoralist.					

Cluster 4. Ground Radar Technology do not significantly affect Secured Communication among law enforcement agencies of farmer - nomadic pastoralist in conflict zones in Nigeria.

INSTRUCTION: You are presented with five (5) options as follows: SA (Strongly Agree), A (Agree), U (Undecided), D (Disagree) and SD (Strongly Disagree). Please tick (√) one cell that is most applicable to you for each statement.

S/N	**ITEMS**	**SA**	**A**	**U**	**D**	**SD**
D1.	Secured Communication among law enforcement agencies will stop the farmers and nomadic pastoralist from carrying weapons					
D2.	Secured Communication among law enforcement agencies will enable the security operatives to be proactive in preventing farmer - nomadic pastoralist conflicts					
D3.	Secured Communication among law enforcement agencies will put fear in the farmers and thereby stop the rustling of cattle's of the nomadic pastoralist					
D4.	Secured Communication among law enforcement agencies will put fear in the nomadic pastoralist and thereby checkmating their cows from destroying the crops of farmers					
D5.	Secured Communication among law enforcement agencies helps limit the conflict between farmers and herders.					

D6.	Secured Communication among law enforcement agencies provides an unrestricted real-time monitoring and report to the security heads and other governmental organizations.					
D7.	Secured Communication among law enforcement agencies makes the location and tracking of law fugitives like farmer and nomadic pastoralist easier.					
D8.	Secured Communication among law enforcement agencies helps in strengthening Nigeria's National security against conflict between farmer and nomadic pastoralist.					

Cluster 5. Ground Radar Technology do not significantly affect the application of Identity establishment and verification of Farmer - Nomadic Pastoralist in conflict zones in Nigeria

INSTRUCTION: You are presented with five (5) options as follows: VGE (Very great extent), GE (Great extent), A (Average), LE (Little extent) and VLE (Very little extent). Please tick (√) one cell that is most applicable to you for each statement.

S/N	ITEMS	VGE	GE	A	LE	VLE
E1.	To what extent will Identity establishment and verification classify and evaluate moving objects and identify if they are farmers or nomadic pastoralists?					
E2.	To what extent will Identity establishment and verification reduces the probability of false alarms, and allows the system to operate in the background until a real threat occurs?					
E3.	To what extent will Identity establishment and verification differentiate political related conflicts from farmer – nomadic pastoralist conflicts?					

E4.	To what extent will Identity establishment and verification differentiate ethnic related conflicts from farmer – nomadic pastoralist conflicts?					
E5.	To what extent will Identity establishment and verification helps to detect warring farmers and nomadic pastoralist?					
E6.	To what extent will Identity establishment and verification help in controlling conflict between farmers and nomadic pastoralist?					
E7.	To what extent will Identity establishment and verification helps in detecting the farmers and nomadic pastoralist within a confined range with radar wavelength?					
E8.	To what extent will Identity establishment and verification be used in comparing the behavior of farmers and nomadic pastoralist towards each other?					

Cluster 6: What are the challenges of using Ground Radar Technology in security surveillance of farmer - nomadic pastoralist in conflict zones in Nigeria?

INSTRUCTION: Please tick the challenges of using Ground Radar Technology in security surveillance of farmer - nomadic pastoralist in conflict zones in Nigeria (Tick as much as possible)

Lack of manpower	☐
Ground Radar Technology can be breached	☐
Poor finance to security operatives	☐
Expensive to install and maintain	☐
Bad weather conditions	☐
Others (Please specify)	☐

_____

_____

_____