USAGE OF DRONES OR UNMANNED AERIAL VEHICLES (UAVS) FOR EFFECTIVE AERIAL SURVEILLANCE, MAPPING SYSTEM AND INTELLIGENCE GATHERING IN COMBATING INSECURITY IN NIGERIA

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ABSTRACT: *One the major problems threatening the Nigerian state at present is the rising spate of insecurity which has now assumed a formidable dimension. The security problem which has posed dangerous threats to national security and statehood therefore is believed to have now necessitated yearnings for the use of drones for effective aerial surveillance, effective, intelligence gathering and monitoring security activities. The daily thirst for blood of innocent citizens and the preference for violence which has now become a huge task to handle by the Nigerian security agencies is a pointer to the need to adopt the use of drones also known as (Unmanned Aerial Vehicles) for security surveillance and intelligence gathering. Unmanned aerial vehicles (UAVs) known variously as drones or remotely piloted vehicles (RPVs) are small aircraft that can fly without an onboard human operator. They are autonomous machines that can carry cameras, sensors, communication equipment or other payloads. Drones' usage has been identified as the most effective for intelligence gathering, aerial surveillance and security monitoring in recent times. The study, however, reveals the various instances of insecurity in Nigeria which include: armed banditry, and robbery, herdsmen killings, ritual killings, kidnapping, Boko Haram attacks, Niger/Delta militancy among others. Factors aiding the upsurge of insecurity and violence are exhibited by the study to include: disconnects between the people and government; weak and poorly funded military establishments; interagency rivalry; absence of intelligence gathering on the part of the security agencies; unemployment for the teaming graduate; non-prosecution of perpetrators of violence in Nigeria among others. In this paper, the various trends in usage of drones for effective security purpose vis-à-vis their application in aerial surveillance in the country are addressed. The study therefore reveals and recommends that drones or UAVs are very effective for aerial surveillance, mapping system, intelligence gathering, and manning security - and it is to be adopted by the security agencies in Nigeria.*

KEYWORDS: Insecurity, Security agencies, Unmanned Aerial Vehicle, Drone, Aerial Surveillance, CCTV.

INTRODUCTION

For over two decades now, Nigeria has been engulfed in insecurity resulting to numerous deaths of innocent civilians, foreigners, some members of the nation's security personnel, elected officials and many government workers. The insecurity problem has assumed various dimensions thereby making the country's political and economic managers and, the entire nation, to rue the loss of their loved ones, and absence of safety in most parts of the country. The rate of crimes; kidnappings, ritual killings, suicide bombings, religious killings,

politically-motivated killing, ethnic conflicts, armed banditry amongst others has increasingly posed dangerous threat to human lives and national security. There has also been strong advocacy for a multi-stakeholder approach to the security solution rather than concentrating heavily on only military options (Imhonopi & Urim, 2013), but the problem seems to have defied several attempts. This fact may not be unconnected with the growing ethnic intolerance, religious bigotry, political rivalry and a large number of citizens in the country who have felt short-changed and not given attention. Abiodun (2016) made this observation when he argued that the primordial tendencies of various ethnic groups towards violence, the perennial upsurge of ethnic militias and the religious extremism in place, given expression to by some sections of the dominant religious groups in Nigeria, have inevitably worsened the level of insecurity and enlarged its scope in all ramifications.

Not only has the continued state of insecurity posed dangerous threats to the fabric of national integration in Nigeria and brought about the ecology of fear, disquiet and anxiety, it has also meted a deadly blow to industrial development. The destruction of the needed infrastructural facilities has taken the state many years backwards. The government has continued to struggle in the face of this daring problem and has continued to evolve strategies to contain or douse the quagmire (Emuedo, 2014). Meanwhile, researchers, scholars, security experts and consultants have also not relented in making various recommendations and viable solutions towards addressing this national issue. Therefore, this paper focuses on examining the contributions of drones (Unmanned Aerial Vehicles) can make in tackling insecurity in Nigeria.

Conceptual Analysis

Insecurity

For comprehensive definition of insecurity, it is important to briefly discus what security means. The fundamental responsibility of government in a state is to keep its citizens safe because like Thomas Hobbes observed, only the state has the wherewithal to guarantee security and save society from anarchy (and since government represents the state), the state through its government should provide adequate security to justify its raison d'être (Gaskin, 1996). As a result of this, Kerr (2010) sees security as a dynamic condition which includes the relative ability of a state to counter threats to its core values and interests. Also, Igbuzor (2011) holds that the security of a nation rests on two important pillars which are (a) the maintenance and protection of the socio-economic order in the face of internal and external threat and (b) the promotion of a preferred international order, which reduces the threat to core values and interests, and also to the domestic order.

Achumba, Ighomercho, Akpor-Robaro (2013) argues that security is an all-encompassing condition which indicates that a territory must be secured by a group of armed forces; that the sovereignty of the state must be guaranteed by a democratic and patriotic government, which in turn must be protected by the military, police and the people themselves; that the people must not only be protected from foreign attacks but also from bad implications of internal upheavals which include: unemployment, hunger, starvation, diseases, ignorance, homelessness, environmental degradation and pollution. It is also argued that in the historical sense, security has been about people and without course to the security of the individual, security is null and void (Igbuzor, 2011). In the same vein, Dike (2010) and Imhonopi and Urim (2012) have taken this argument a step further by emphasizing that Nigeria's security

should be based on a holistic view which views the citizenry as the primary beneficiaries of security and developmental goodies that the state provides. Therefore, Nigeria's security involves efforts to strengthen the capacity of the Nigerian government towards promoting its interests to contain internal and external attacks, crimes, kick out corruption, promote growth and development, and improve the welfare of life of citizenry.

Security is, generally, taken to be about the condition of feeling of safe, the protection and preservation of core values and the absence of threats to these values. It also has something to do with freedom from danger or from threats to a state's ability to protect and develop itself, promote its cherished values and legitimate interests (Abiodun, 2016). Security is also a major human desire; it is significant to the extent that absence of it renders people ineffective in all sense. Abraham Maslow's work on human needs also ranked security as second (next to physiological needs) in the hierarchy of human needs. That is why Abiodun (2016) submits that traditionally, security of lives and property is exclusively the preserve of the state but the dynamics of the world today has clearly revealed that security is the responsibility of all. In the same vein, Abiodun et al (2019) views national security as the physical protection of citizens and territorial integrity, of which it is a part, but also the promotion of the economic wellbeing and prosperity of Nigerians in a safe and secure environment that promotes the attainment of national interests and those of foreign partners.

In his analysis, Wilson (2014) revealed the various forms of national security as follows;

- *Political Security*: This refers to protecting the sovereignty of the government and political system and the safety of society from unlawful internal threats and external threats or pressures. It involves both national and homeland security and law enforcement.
- *Economic Security*: involves not only protecting the capacity of the economy to provide for the people, but also the degree to which the government and the people are free to control their economic and financial decisions. It also entails the ability to protect a nation's wealth and economic freedom from outside threats and coercion. Thus, it comprises economic policy and also international agreements on commerce, finance, and trade.
- Energy and Natural Resources Security: is usually defined as the degree to which a nation or people have access to such energy resources as oil, gas, water, and minerals. This would be more accurate to describe as access freely determined by market without interference from other nations, political or military entities for non-market, political purposes.
- *Homeland Security*: this is actually an avalanche of domestic security responsibilities that have been organized since 9/11 into a single agency, the Department of Homeland Security. It also includes airport and port security, border security, transportation security, immigration enforcement, and other related matters respectively.
- *Cyber Security*: indicates the protection of the government's and the peoples' computers and data processing infrastructure and operating systems from harmful interference, whether from outside or inside the country. And it therefore, involves not only national defence and homeland security, but also law enforcements.
- *Human Security*: a concept that got developed at the United Nations after the Cold War. It conceptualizes security as encompassing peoples' safety from hunger, disease, and repression, including harmful disruptions of daily life. recently, the concept has

got enlarged to include economic security, environmental security, food security, health security, personal security, community security, political security, and the protection of women and minorities in a state.

- *Environmental Security:* here, the environmental degradation that is caused by man is a threat that must be addressed by treaties and international administration as if it were the moral equivalent of a national security threat. In the past, natural disasters were not considered threats to national security, but such presumption has changed as the ideology of climate change and global warming "holds water" in national security matters.

In contrast, insecurity is described to be the anti-thesis of security and this has actually attracted various submissions as want of absence of safety, danger, hazards, uncertainty, want of confidence, state of doubt, absence of guard, instability, trouble, lack of protection and being unsafe, among others (Achumba, Ighomereho & Akpor-Robaro, 2013). Achumba *et al* further argues that these common names point to a condition where there exists a vulnerability to harm, loss of life, property or livelihood. Therefore, they consider insecurity to be a state of not knowing, a lack of control, and the inability to take defensive action against forces that portend harm or danger to an individual or group, or that make them vulnerable. At the same time Dike (2010), submits that insecurity is "the state of fear or anxiety from an alleged lack of protection." It refers to lack or inadequate freedom from danger. This definition reflects physical insecurity which is the most visible form of insecurity, and it feeds into many other forms of insecurity such as economic security and social security. The study views insecurity as a situation where human and national security of a nation is impeded or compromised by internal or external forces or interests soiled by weak or poor economic, military and human development.

THEORETICAL FRAMEWORK

Anomie Theory

The Anomie Strain Theory is a sociology and criminology theory developed in 1938 by Robert K. Merton in his social structure and anomie publication. The theory submits that society usually puts pressure on individuals to attain socially accepted goals, though they lack the means. This therefore, results into strain which may push individuals to commit crimes, like unleashing mayhem on the society, selling hard drugs, joining terrorist groups or involving in prostitution among others, as a means of gaining financial security. Robert Merton's theory stems from a fundamental question that he posed for the American society on why the levels of deviance were so different among different societies (Brown, Esbensen and Geis, 2010). He argued there could be deviance where there is a difference between what defines success and the proper means to attain designed goals. In the same vein, Merton submitted that when individuals are faced with a gap between their goals and their current status, strains usually become order of the day or comes into play. It is argued that crime emanates from the divergence between the social objectives that are recognized as legitimate and the limited access to the means necessary to attain these goals (Brown, Esbensen and Geis, 2010).

The theory has implications for criminal policies, and it points to the much-quoted synergy between social and criminal policy. The theory is predominantly utilitarian in nature; people act criminally as they lack alternative possibilities. In the same vein, Merton explains monetary crimes such as burglary or robberies among other and due to the lack of access to legitimate means to achieve goals, and criminality only exists within the lower class as it can be assumed that the middle and upper classes already possess these means at their disposal (Brown et al, 2010). This theory helps us to understand the world view of criminals, armed robbers, kidnappers, terrorist groups, illicit drug carriers, and their interactions with and commitment of crimes and also implications of their heinous activities to Nigerian security at large.

METHODOLOGY

The study employed descriptive research method. The population consisted of selected Nigerian security agencies: Nigeria Police, Nigerian Air Force; Nigerian Army; National Drug Law Enforcement Agency (NDLEA); the Department of State Security Service; Nigerian Communications Commission (NCC); and Security, Computer and Mechatronics Engineering experts. Data were sourced from primary (interviews and administration of questionnaire) from the selected respondents respectively. Data were also sourced using the secondary sources which include (books, newspapers and bulletins, reports on intelligence, surveillance and security. Purposive sampling technique was employed. A ten-item structured questionnaire was used to collect data for the study. The instrument was validated and results were content analyzed.

OVERVIEW OF THE SELECTED SECURITY THREATS AND INSTANCES OF INSECURITY IN NIGERIA

Numerous literature materials exist that chronicle elaborate case studies of insecurity in the country from different informed prisms. This study will not duplicate such efforts but will single out selected cases of insecurity in the country. Some of these security challenges have been briefly highlighted as follows:

The Niger Delta Crisis/Militancy

According to Emuedo (2014), the Niger Delta conflict came up in the early 1990s as a result of tensions between international oil companies (IOCs) and some community representatives of the region who felt they were being exploited without due compensation from the oil companies. Following this, agitations continued in the region during the period and persisted till date. However, competition for oil wealth in the region gave rise to agitations, violence and subsequent extra-judicial killing which led to demise of Ken Saro-Wiwa and other nine (9) Ogoni leaders during General Sanni Abacha junta (Emuedo, 2014). The killing was condemned both within the country and international community and was followed by sanctions placed on Nigeria then. It is observed that the failure of government, particularly during the military era, to address the root causes of the agitation which include; environmental problems, poverty, unemployment, lack of basic amenities, among others in the region, resulted in the spawning of ethnic militias of Niger Delta origin leading to the militarization of nearly the entire region.

Thus, the foundation was laid for the wave of insecurity that beleaguered the entire region and spread throughout the tentacles of power. Although in order to ameliorate the environmental degradation and the absolute poverty in place, the government therefore, established various institutions to douse the tension in the area; the Oil Mineral Producing Areas Development Commission (OMPADEC), Niger Delta Development Commission (NDDC) and Ministry of Niger Delta (MND); these intervention remedies, notwithstanding, the conflicts and insecurity in the Niger Delta region persisted (Emuedo, 2014). In fact, the region witnessed severe security threats and the emergence of other agitating groups affiliated to the Niger Delta Avengers (NDA); Movement for the Emancipation of the Niger Delta (MEND) like the Niger Delta People's Volunteer Force (NDPVF); and the Niger Delta vigilante (NDV). These groups purportedly joined the struggle to address the injustice by the Federal Government against the region and this move exacerbated the security problems not only in the region, but also in the entire Nigerian state (Ibid).

High Rate of Kidnappings

The history of kidnapping in Nigeria is traceable to hostilities, conflicts and violence in the Niger Delta region (Abiodun etal, 2019). Kidnapping, which is the act of abducting somebody and keeping him/her as a prisoner in order to get a ransom for his/her release, suddenly took on a whole new economic attraction in the South-East of Nigeria. The phenomenon thrived in the South- East zone, especially in Abia and Imo states, where prominent indigenes and residents of the states were easy targets and later spread to other parts of the country. It is evident, however, that kidnapped victims pay between the ranges of N1m to N7m as ransom in Nigeria to secure their release. The criminal act has now become an easy way of making money. Up till now, it is quite disheartening that some disgruntled elements would just kidnap and keep someone for five or 10 days, they get N7m and above just light that and they move on (Akanji, 2019).

The Boko Haram Attacks in the North Eastern region of the Country

This is another major security threat in Nigeria and has negatively affected the nation's economy. According to Abiodun (2016), the word "Boko Haram" means wetern education if forbidden. The Boko Haram is a controversial Nigerian militant Islamist group that has sought to impose Sharia law or its radical interpretation of Islam on the northern states of Nigeria and then to other parts of the country. It is rightly affirmed that the group opposes not only western education, but also Western culture and modern science. The group has claimed thousands of Nigerians' lives and lots of valuable property looted and destroyed (Abiodun, 2016). The Boko Haram group also promotes a radical form of Islam which makes it "haram" or forbidden for Muslims to take part in any political or social activities in the society. This includes voting in election, wearing of shirts and trousers or receiving secular education. Founded in 2002 in Maiduguri by Mohammed Yusuf, the death of their leader in 2009 turned the group into a killing machine that has put paid to the economic development of the Northern region in all ramifications.

Herdsmen Killings or Assassinations of Innocent Nigerians

There is high rate of killings by herdsmen in Nigeria at present, as everyone remains unsafe. As generally perceived in the country, the paper does not intend to report the disgusting cruel butcher of 73 human lives in Benue State arising from the farmers-herdsmen crisis;

kidnapping and killings in Nigeria, but it is necessary to also report the recent kidnapping and killing of Chief Olu Falae's daughter, Mrs. Funke Olakunri on July 12, 2019 along Ore road; Kidnapping of Professor Adewole's son on his farm in Ibadan; kidnappings and killings in Jos, Jigawa, among others. There also exists armed banditry in Zamfara, Sokoto and Jigawa States respectively (Field Research Report, 2020).

Ethno-Religious Conflicts

Ethno-religious conflicts have been identified as an instance of insecurity in Nigeria (Igbuzor, 2011). Ethno-religious conflicts exist when the social relations between members of one ethnic or religious group and another of such group in a multiethnic and multi-religious society is characterized by lack of cordiality, mutual suspicion and fear, and a tendency towards violent confrontations to settle grievances. These conflicts have also revolved around who gets what and how in the state especially as it concerns the distribution of scarce resources, power, land, chieftaincy titles, local government councils, control of markets and expansion of religious territories. These conflicts have resulted in large-scale killings and violence among ethno-religious groups in the country (Field Research Report, 2020).

OVERVIEW OF THE CIRCUMSTANCES AIDING INSECURITY

From the Field Research Report (2020), the growing rate of insecurity in Nigeria is as a result of the factors or circumstances illustrated as follows:

Disconnect between the People and Government

Over the years, there has been a growing disconnect between the people and government. Governments, whether military or civilian, have not tried to bridge this chasm, thus creating misunderstanding, mistrust and resentment. Consequently, because the people do not understand government or have a perception that government does not care about their welfare, they become easy prey to centrifugal forces who co-opt/incite them to vent their anger on perceived enemies of the people and sometimes go to the extent of destroying national totems.

Weak and Poorly Funded Military Establishments

In spite of the high security vote state governments receive on a monthly basis; there is greater insecurity in many states. Some of these monies find their way into the pockets of some highly-placed private citizens and the Chief Executives of the states, leaving the hapless citizens to the mercy of criminals and sociopaths. Also, the armed forces, paramilitary establishments and the police under federal control are weak institutionally, heavily politicized and poorly funded. This status quo makes it easy for the nation's security to be compromised.

Interagency Rivalry

The failure of security agencies such as the police, the military, state security services and paramilitary units to share intelligence information has been identified as one of the factors negating the quick apprehension of culprits.

Absence of Intelligence Gathering on the part of the Security Agencies

Also, the failure of intelligence gathering by the security agencies as well as the near passivity of security operatives in proactively policing the country, coupled with the non-apprehension of culprits, is also a contributory factor to the rising tide of insecurity in Nigeria. Of course, when the armed forces and paramilitary agencies are not well-tooled with modern fighting and security gadgets and their welfare is not given priority attention, they may not want to make any sacrifices for the nation. All of these factors point to a passive national security team that is not really committed to fighting crime or stopping the merchants of violence or terror envoys from having the field day in the country.

Non-Prosecution of Perpetrators of Violence in Nigeria

The lack of arrest and prosecution of perpetrators and sponsors of violence has encouraged many more social deviants and their godfathers to throw caution to the wind to perpetrate evil in the land. The Nigerian society has become a rigout of powerful fiefdoms controlled by feudal lords who are almost as powerful as the state and maintain a rental economy within the larger national economy.

Loss of Socio-Cultural and Communal Value System

The collapse of moral values within Nigeria is one critical factor to the continued security challenges that the country is faced with. The disintegration of communal value system which placed high premium on human life and despised greed, oppression and exploitation of the weak, among others, has also contributed to the unpleasant security environment in the country. New values that are zero-sum, paternalistic, narcissistic, chauvinistic and corrupt in nature and that preach that might-is-right have all taken over. Endearing social values and morals have been traded off for Western values (Field Research Report, 2020).

IMPLICATIONS OF THE MENACE TO NATIONAL SECURITY

There are several implications of the menace to national security, amongst others as stated follow:

There is perpetual phobia (fear) among Citizens in the region

Permit me to ask this question "Who wouldn't get scared especially after hearing of witnessing a bomb blast?" On hearing of terrorism, Fulani herdsmen's kidnapping and killings on Lagos-Ibadan express way, Ibadan-Ilesha; Ibadan-Ijebu-Ode roads and others, the first thing that strikes people's minds is concern for their own safety, family and property (Adeyemi, 2019). Fear among citizens is hampering economic growth and development since the economy cannot not improve if all citizens stay locked within the four corners of their house while trembling in fear. Traders no longer open their shops or businesses beyond 8 or 9p.m on daily basis; they do this to ensure not falling preys or victims of insecurity.

Human lives are being claimed or lost

Not only the killing of people an infringement on human rights, it is also a violation of God's own commandment. Humans are not allowed to murder fellow humans but in the absence of efficient security and good leadership in the country, innocent lives get lost on daily basis (Akanji, 2019). People get killed in armed robberies on the highways; road accidents due to

bad roads; kidnappings and killings by Fulani herdsmen; bomb blast following terrorist attack; some fall victims to cultist clashes while others get hit by bullets from armed robbers robbing banks and places. The number of lives lost in Ikare-Akoko bank robbery recently was high. Countless number of students fall victims to stray bullets all because of our lacking security systems in the region.

Large numbers of property, economic growth and development are lost or destroyed

If human beings are not safe, how much more our property? In the past, we have been hearing cases of property vandalization by militants and other vandals in Lagos, Ogun and Ondo States, scooping fuel for personal gains. They blow up pipelines and cause oil spillage which in turn disrupts the order of the ecosystem, leading to death of fishes in rivers, death of crops, destruction of farmlands and land pollution (Akanji, 2019). In the case of oil spillage, it is good to reveal that the cost of cleaning up oil spillage is on the high side, this huge amount of money injected into oil spill control is what the government would have invested into other sectors of the economy. So, you can see how the product of insecurity robs Nigeria of her economic growth and development. As we are all aware that Southwestern Nigeria was known to be the major cocoa producer and timbers in Nigeria, the fortunes have all got lost (Akanji, 2019).

Discouragement of industrialization as a result of insecurity, bad government policies and erratic power supply or electricity

Akanji (2019) submits that industrialization is prerequisite for economic growth and development. The highly developed countries are the highly industrialized and technologically advanced countries. Industrialization is also necessary for the curbing of unemployment and reduction of crime rates. Now, for an industry to thrive properly and efficiently, the working and environmental conditions must be favorable, people must be free to walk and talk without harboring fear of getting bombed or shot at, at any time. On good note, numerous industries and multinational businesses in the Southwestern Nigeria in the past have now folded up or left for abroad due to insecurity, bad/unfavourable government policies and erratic power supply or electricity.

Increased crime rates and other social vices

Insecurity has a direct relationship with crime rates and social vices. The more insecure a place is, the more people will have access to it and the more criminal acts people will commit. There will be increased cases of extortion, murder, robbery, rape, drug dealing and abduction, prostitution, gender cross-dressing etc (Abiodun et al, 2019).

Discouragement of social and religious activities

Thousands of people have been killed in churches and mosques, with the Catholic Church recording the highest number in the year 2016. Attacks are often directed to a highly populated area as in the case of churches and social gatherings. People being aware of this fact tend to get discouraged from being in such places (Abiodun, 2016).

USAGE OF DRONES FOR AERIAL SURVEILLANCE AND COMBATING INSECURITY IN NIGERIA

The insecurity and insurgency could be adequately and effectively fought using drones most especially at the border areas, with updated mapping system and the use of drones as surveillance. Abolurin (2015) argued that increasing challenges arose from the porosity of Nigerian borders and he called for urgent and improved collaboration between Nigerian armed forces and office of Surveyor-General on updated mapping system against insurgency. It was revealed that men of the armed forces have been trained on the usage of drones to fight insecurity and for the surveillance of flash points. This would also resolve all land-based violence or conflicts among the warring ethnic groups in the country. This is true in the sense that surveying and updated mappings across the country will, in doubt, prevent security threats, insurgency, illegal influx of people into the country, human trafficking among other security issues, and put an end to all land-based violence coming up among the various ethnic groups in the state (Abolurin, 2015).

In the recent years, drones or unmanned aerial vehicles (UAVs) are more employed in military operations. But at present, the use is dynamically expanding in the areas of commercial, scientific, recreational and other applications, such as policing/ surveillance, aerial photography and agricultural irrigation and others. Civilian drones have now out-numbered those of the military, with estimates of over a million sold by the foreign merchants or manufacturers in the year 2015. In addition to these, drones are being considered for use in domestic surveillance operations to protect valuable assets, assist in crime fighting, disaster relief, immigration control, and environmental monitoring (Electronic Privacy Information Centre, 2016).

In most developed country like the United Kingdom, Germany, United States of America, drones have been employed domestically by federal, state, and local governments in a range of circumstances for different operations. They are being deployed in policing their borders and to deter all sorts of unlawful border crossings by unauthorized aliens, criminals, and terrorists, and as well to help detect and interdict the smuggling of weapons, drugs, and other contraband into the country (Escutia, 2009). Drones may also be deployed for a wide range of transportation operations and planning purposes: incident response, monitor freeway conditions, coordination among a network of traffic signals, traveler information, emergency vehicle guidance, track vehicle movements in an intersection, measurement of typical roadway usage, monitor parking lot utilization, estimate Origin-Destination (OD) flows. Drones gained momentum during their use in the various post-9/11 armed conflicts in the Middle Eastern states. The United States government makes use of drones to conduct detailed surveillance and reconnaissance activities on countries such as Afghanistan, Iraq, and Iran, as well as to drop targeted missiles. As at early 2007, it is evident that over seven hundred (700) drones were being utilized in Iraq territory (Peterson, 2009).

Another major contribution or merit of drones is that, they become more useful for aerial surveillance, they can move at higher speeds than ground vehicles as they are not restricted to traveling on the road network. They can potentially fly in conditions that are too dangerous for a manned aircraft, such as evacuation conditions, or very bad weather conditions. Unmanned Aerial Vehicles (UAVs) are usually programmed off-line and controlled in real-time to navigate and to gather transportation surveillance and intelligence data (United States Air Force, 2016). UAVs can view a whole set of networks of roads at a time and inform the

base station of emergency or accidental sites. It also permits timely view of disaster area to access severity of damage. Most of the drones are able to be flown for up to 45 minutes on a single battery charge and can travel up to 2 miles from the person controlling it, reaching effective surveillance altitudes of approximately 1,000 feet respectively (Ibid).

Moreover, drones are designed to undertake constant, persistent surveillance to a degree that former methods of video surveillance were unable to achieve. By virtue of their design, their size, and how high they can fly, drones can operate undetected in urban and rural environments. As discussed, surveillance UAVs can be programmed to launch at regular intervals throughout the day, survey specific areas or features on the map, record video and transmit it all back in real-time, or record it to a DVR for logging and review later (Collinson, 2011). They can also be programmed to deploy when event-driven triggers, such as seismic sensors, motion detectors and invisible infrared geo-fences are activated by an unidentified presence. Drones produce minimal noise, and can be equipped with night vision cameras and thermal sensors, allowing them to provide imagery that the human eye is unable to detect. Surveillance drones are equipped with sophisticated imaging technology that provides the ability to obtain detailed photographs of terrain, people, homes, and even small objects (Elmendorf, 2010). Giga-pixel cameras used to outfit drones are among the highest definition cameras available, and can provide real-time video streams at a rate of 10 frames per second. They usually carry infrared cameras, heat sensors, GPS, sensors that detect movement, and automated license plate readers.

Classification of Drones

According to Collinson (2011), drones can be broadly classified into five functional categories:

- *Target and decoy Drones:* they provide ground and aerial gunnery; a target that simulates an enemy aircraft or missile.

- *Reconnaissance (Surveillance) Drones:* they provide battlefield intelligence.

- *Combat Drones:* they provide attack capability for high-risk missions.

- *Logistics Drones:* they are used for delivering cargos.

- *Civil and commercial Drones:* they are used for agriculture, aerial photography and data collection.

THE VARIOUS DRONES OR UAVS SPECIALLY DESIGNED AND THEIR USEFULNESS FOR AERIAL SURVEILLANCE OR RECONNAISSANCE

General Atomics MQ-9 Reaper

General Atomics MQ-9 Reaper (formerly named Predator B) is a drone or an unmanned aerial vehicle (UAV) that is remote-controlled and capable of flight operations. It was specially designed by General Atomics Aeronautical Systems (GA-ASI) basically for the United States Air Force. It is usually known as a Remotely Piloted Vehicles or Aircraft which indicates the users or Forces' human ground controllers for homeland security. Other users of the drones apart from the US are; Australia, Dominican Republic, France, Germany, Italy, Netherlands, Spain and United Kingdom respectively (Cavoukian, 2012). This MQ-9 Reaper

is the first hunter-killer UAV designed for long-endurance, high-altitude surveillance. It has a 950-shaft-horsepower (712 kW) turboprop engine. Its greater power allows it to carry 15 times more ordinance payload and cruise at about three times the speed of the MQ-1 and it can be monitored and controlled by aircrew in the Ground Control Station (GCS). It consists of multiple aircraft, ground control station, communications equipment, maintenance spares, and personnel. The drone moves with a maximum speed of about 260 knots and a cruising speed of 150–170 knots. It could be armed with a variety of weaponry, including various fire missiles and useful most especially for long-term loitering operations, surveillance and support of ground troops (Cavoukian, 2012).

Arcturus T-20

This drone, Arcturus T-20, is a runway independent tactical surveillance UAV which was developed by Arcturus-UAV Company in the US and at the same time primarily deloyed by the States' Navy since the year 2009. The drone is of medium range, and includes three aircraft, ground control station, portable launcher, and support trailer for equipment and personnel. The airframe is entirely composite with complex wet wings tested to stresses. Arcturus T-20 drone carries a retractable gimbal-mounted, digitally stabilized, electro-optical or infrared camera that relays video in real time via a C-band LOS data link to the ground control station (GCS). The drone is also powered by a 4-stroke, fuel injected gasoline engine, while the aircraft burns two (2) lbs of fuel per hour at cruise. It does not require an airfield to operate and it can land on dirt, grass, desert, or gravel roads respectively.

DRS RQ-15 Neptune

The DRS RQ-15 is a surveillance UAV developed by DRS Company in the United States of America in the year 2010. This DRS RQ-15 Neptune is the latest in the DRS family of mobile, low-footprint tactical Unmanned Aircraft Systems, and can be operated directly from land or sea. The drone can also be disassembled into three parts and carried in its launcher or transport case. And a unique feature of it is a pair of built-in receiver tubes, which allows it to slide onto its launch rails for compact storage inside the transport container; and at the same time be auto-launched in a matter of minutes. The six-foot launcher allows the aircraft to be deployed from utility vehicles or small surface vessels supporting operations day or night, on land or at sea (Elmendorf, 2010).

Schiebel Camcopter S-100

This is a UAV produced in Austria by Schiebel Company in the year 2005, using a rotorcraft design. The drone can operate day and night, even under adverse weather conditions, with a wide range of about 200 kilometers on land and at sea. The system can also navigate on its own via pre-programmed GPS waypoints or can be operated directly with a pilot control unit. The drone activities are planned and controlled using a simple point-and-click graphical user interface (US Air Force, 2016).

Honeywell RQ-16 T-Hawk

Honeywell RQ-16 was designed in the United States of America in the year 2000 by a company known as Honeywell, and it is good for single-person operation and backpack deployment. It got flown and tested and evaluated for the first time in the month of January, 2005 by the US Army infantry (US Air Force, 2016).

T-Hawk

The drone, T-Hawk that got its abbreviations from "Tarantula Hawk", was manufactured by Honeywell in the US, and it is being used for short-range surveillance, reconnaissance, target acquisition and battle management. The initial military evaluation of the system focused on the detection of improvised explosive devices (IEDs). It is characterized with design features having two (2) pods on the outside of the duct, which house flight control electronics, video camera, GPS receiver and radio respectively (Hiltner, 2013). Another merit of the T-Hawk drone is that it can be operated from within the vehicle and by a single person. It as well uses radio for communications and supports up to ninety-seven (97) channels that can easily be tuned to. The range of communication is about five (5) to ten (10) kilometres. The ground control station consists of portable computer which commands the vehicle through GPS satellite coordinates. The speed and position of the drone are monitored through an internal measurement unit. The ground control station provides video documentation of the situations in real time and can store up to 240 minutes of sensor imagery during usage (Hiltner, 2013).

Aero Vironment RQ-20 Puma

This is a small, battery powered, American hand-launched unmanned aircraft system produced in the year 2008 by AeroVironment, a company based in California, United States of America. Its primary mission is surveillance and intelligence gathering using an electro-optical and infrared camera. Its function is recognized as "ISRT" (Intelligence, Surveillance, Reconnaissance and Targeting). The drone is waterproof and protects vital systems such as the battery compartment, allowing it to operate effectively on sea or water (Tice, 1999). Its power is served through a conventional engine spinning a two-bladed-propeller unit mounted to the front of the fuselage. Its noise level is rather quiet, allowing it to remain unnoticed to targets on the ground during use. Also, the wings include a high-mounted main assembly with noticeable outboard dihedral and a traditional single-fin tail unit. The drone is so small that it can be managed by a single operator in the field with a second operator managing the Ground Control Station (GCS). It is also hand-launched (Ibid).

Denel Dynamics Bateleur

Bateleur is an unmanned aerial vehicle (UAV) specially designed and built for aerial surveillance. Its primary function is for surveillance, with a secondary signals' intelligence capability. It takes off and lands conventionally, on a runway, and has retractable undercarriage. It is also completely autonomous, allowing it to take off, conduct its own mission, and also land without any human control needed (Hiltner, 2013).

From analysis of the study data, it is described that the use of CCTV provides a veritable means of surveillance in crime fighting. For instance in Nigeria, drones and Closed Circuit Televisions (CCTVs) were deployed in Lagos and Abuja as part of a National Public Security Communication System – the project is a technology-driven approach in military attacks, crime detection and fighting while in the Northeast, the Nigerian Military authorities are deploying several platforms in the fight against insurgency (Field Research Report, 2020). The approach would also assist in tackling the myriads of challenges such as vandalism of critical national infrastructure, kidnapping, insurgencies and terrorism amongst others. The drones and CCTVs when deployed would map out, snap the pictures and cover the various hideouts of criminals and the flashpoints in the country and these imageries or pictures would

be analyzed and evaluated by the intelligence experts to forestall crimes and insecurity in the country (Field Research Report, 2020). In the same vein, drones could be deployed to the Sambisa forest to capture the imageries of the Boko haram insurgents for easy capture.

RECOMMENDATIONS

i.   It is recommended that various states governments should be licensed to use drones for monitoring forests and other hideouts of criminals in their domains; at the same time, more security officers or vigilantes should be recruited among indigenes and residents of the various communities in each region in the country.

ii.   Close Circuit Televisions (CCTVs) should be installed on highways and other strategic locations so that activities in some of those hidden places can easily be exposed, adequately monitored and open to effective review.

iii.   Though, the increased use of drones poses a threat to people and their property. Drone surveillance also implicates public safety issues as the drones operate in airspace that may also be used by commercial and private aircraft. Pursuant to this, it is recommended that the Nigerian security agencies should regulate and control the proliferation of drone surveillance.

iv.   It is also recommended as privacy advocates have argued that law enforcement officers and individuals using drones for security surveillance, must ensure they secure a warrant before using it.

v.   Also, on data retention in the usage, data collected from a drone on a surveillance flight should only be accessible to law enforcement officials for a period of time. The data would eventually be deleted when there is no longer a level of suspicion associated with the monitored individual.

vi.   Also, the use of technology in crime fighting can only be effective if it is complimented with timely human intelligence and there is need for absolute and effective coordination among the various security agencies in Nigeria.

vii.   It is recommended that the governments at all levels should be required to regularly publish information about the use of aerial surveillance equipment.
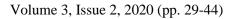
CONCLUSION

The benefits of drones or unmanned aerial vehicles (UAVs) for aerial surveillance are highly significant as it contributes enormously in tackling insecurity in a state. The study has therefore, availed the Nigerian security operatives and agencies the opportunity to gather facts about the development of droves or UAVs being deployed for aerial surveillance and securitization matters. As revealed by the paper, it is discovered that there are lots of surveillance drones that can be made use of by the security agencies and operatives in a state. It is now concluded that if the drones or UAVs are deployed for aerial surveillance and

securitization, the increasing level of insecurity in Nigeria would definitely become a thing of the past.

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DATA SOURCES

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