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Decentralization of Nigeria Air Power: Army's Drone (UCAV) Reconnaissance, Strike/Fire Complex Combat System

Ibili Celestine

Department of Political Science, and History and Strategic Studies, University of Lagos, Lagos, Nigeria

Email address:
Celestine.bobo@yahoo.com

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Abstract: Military power has been a centerpiece in the negotiation of state formation and geopolitical stability. The business of the arm forces of nations has been from a historical perspective anchored on the defense of its sovereign territorial integrity, and the advancement of national interest afar. The advent of the modern state system has seen a reshape in the way and manner with which war is waged. Central to the changes in the conduct of war is the revolution in military affairs. The introduction of aviation resources to the conduct of war in the 20s speaks volumes of the ever-changing strategic environment. The weapon system of the first and second world wars will no doubt be unimaginable to the strategists of the renaissance era. The age of reason has thus passed different phases; the sky has steadily remain a significant part of the domain of warfare. However, the nature of warfare has not remained stagnant. Airpower, which is the weaponization of aviation resources have passed through various phases. Airpower no doubt emerged in the war toolkit of the symmetric threat environment of the twenties, but its demand in the asymmetric threat environment of the 21st century has led to more innovation in capabilities, nature, and missions, and debate for a policy change in command and control. A debate, whose literatures were all-encompassing in the American discourses on strategy, capability, and operations. This article brings the debate on the changing role of airpower, and the need for more reliance on drones and decentralized command and control between the Airforce and the Army in the current threat environment, from a Nigerian perspective. As the battle against Boko Haram ranges, the need for arm overwatch and arm overmatch that aids maneuvering the battlefield and it gray zones to defeat the terrorism, and guerrilla insurgent groups becomes critical in shaping the northeast theater in the image of the Nigerian positive peace. Therefore, the need for drone ISR and fire/strike capabilities to become organic to surface forces, in tonaid the encirclement and obliteration of enemy through observation, orientation, decision, and actions line of operation, which is the critical role of effective battlefield operating system, a mechanism the theater commander employs combat power towards the destruction or exhuastion of the enemy. It should be noted that this article relied on secondary data collection.

Keywords: Decentralization, Commandand Control, Drone, Airpowe, Battlefield Forces, Reconnaissance, ISR, Battlefield Operating System

1. Introduction

Inter-service rivalry on the nature and role of different military organizations in warfare has historically been one of the underpinning factors that define and influence defense policy in modern times. Military decision and defense policy are among the major determinant of how wars are to be fought, won, and lost. Thus, discussion of Interservice rivalry on tactical air task mission in support of surface forces in a close battle and critical time-sensitive targeting is essential to understanding how wars are won or loss. It is also important to understand the factors that undermined or aid the effective implementation of military strategy. Unresolved interservice rivalry affects nations fighting force' force structure and is also influenced by different nation's force structure. More so, it is common not to have a universal epistemic divide on the airpower arguments. American force structure differs both geographically (with regards to the widespread of American geopolitical interest), geometrically and exponentially from that of the Nigerian defense force and so is the argument on the extensive need of airpower force structure required by different military organizations by both countries' military.

The level of role the United State military plays in her foreign policy implementation and advancement, the nature of her national security, and the frequent use of military capability as a toolkit of foreign policy and national security, and its share resources, influences the amount of resources allocated to defense budgeting, which in turn influences the level of interservice rivalry on the use of equipment and the definition of role in military operation.

All forms of power struggle manifest a power-knowledge built culture and are mostly influenced by the culture of individual organizations. Therefore, it is not surprising that air-power interservice rivalry manifests itself, firstly in the American military consciousness both in war and peacetime.

Ian Horwood comprehends this rivalry in his classic work by stating that, "the differing service requirements in times of peace and war may perhaps be illustrated by the issue of the close air support of US ground forces in both the Second World War and the Korean War. In both cases, the services were obliged to revisit close air support arrangements established in peacetime because they were so clearly failing the test of combat"[1].

Air tactical mission task, with regards to close air support mission for ground combat forces has become the area of military operation where air force and the army have the most crucial affinity, and yet where the disagreement on the control of combat air-power abounds. Beginning from American involvement in world war 1&2, and the Korean War. The argument between the army and the air force on the exclusive control of aviation resources designed for close air support missions, ensured from the aforementioned periods. The army preferring to have air tactical support aviation assets permanently synchronized with ground combat unite under a singular control by ground combatant commander. Where as, the air force sees close air support mission as a joint mission-essential under theater control of a superior air force command. The disagreement is furthered by what most air force command considered as close air support in their tactical air task order, thereby screening army's order for support base on air force preferences, and sometimes exist quarrels on time of delivering or executing close air support's air task orders [2].

Moreover, a key concept in understanding the complex nature of air task order for close air support resource functionality is Command and control, *"command and control is the exercise of authority and direction by a properly designated commander over assigned forces in the accomplishment of the mission. Command and control functions are performed through an arrangement of personnel, equipment, communications, facilities, and procedures employed by a commander in planning, directing, coordinating, and controlling forces and operations in the accomplishment of the mission"[3]*. In a nutshell, Command and control is the application of available resources for planning, coordinating, controlling of designed military forces towards the execution of strategic, operational objective, and tactical mission task. Command and control employ and control the bounds of military power tailored towards attaining mission tasks.

The command of a designed force is either centralized or decentralized depending on the nature of the operation. The argument for the decentralization of command and control of airpower is mostly made as a result of the non-linear nature of the contemporary military operating environment. The chaotic nature of fourth-generation warfare, with a non-unified center of gravity of enemy forces, demand that resources and military asset's command and control be structured in a manner that responds appropriately to military requirement of target spotting, interdiction, and close air support (for arm overwatch and arm overwatch), which in essence aid the proper application of battlefield operating system at all spectrum of military engagement, and more importantly support the attainment of objectives set out to be achieved by a tactical mission task.

Furthermore, at the strategic level, command and control is the authority to design strategy and apply the available military resources to attained strategic objective, it also includes the authority to guide the way and manner in which operational commanders comprehend the political objective and intent of government policy towards the mission at hand. At the operational level, it entails the authority and control of the different segmented, multiple, and simultaneously coordinated tactical maneuvers that define operational art. And at the tactical level, command and control is the authority to apply the art of tactics, techniques, and procedures by directing combat power in a way that makes the enemy behave in manner acceptable to mission task, it could also be the authority to apply combat power in destroying the enemy's will to continue fighting or for a destruction of enemy's forces. Furthermore, in some special and unusual occasions, when a unit has lost all communications with a superior command and sister combat unit, command and control at the tactical level assume a unique position, which is influenced by the military character of Autonomous Operations. In nutshell, command and control appears in all level of warfare. However, the amount of resources at the disposal of each level of military organization differs and has been an issue to reckon with, since the creation of modern military force.

Thus, this paper will argue that though it is important to allow the air force to exercise general control over strategic air-power component of national military power, the decentralization of airpower to ground forces command and control should be a reflection of missions' critical requirement in support of the flexible application of initiative of means in the offense and defense operational and tactical art of maneuver, and that the degree of decentralization should varied by operational requirement.

Furthermore, it is pertinent to state that the question of centralization and decentralization between the air force and the army mostly exist at the level of close air support and other tactical airpower needs of the army asymmetric combat group, which is a core ingredient in modern land combat doctrines (air/land doctrine). Thus combat drones can be employed at the tactical mission task level to provide close

air support either in terms of fire support needed by army division and brigade's command and control element (AD&BC2) or perform other roles in support of battlefield operating systems (BOS).

As argued by Armin Krishnan, that drones are weapons made for asymmetric warfare, with more relevance to intra-state conflict, rather than inter-state. he further argued, that armed drones' battlefield reputation is as a result of the dynamic change in contemporary threat environment and a shift from conventional warfare to a focus on counter-terrorism, counterinsurgency, and the prosecution of transnational criminal activities [4].

At the division, brigade, and battalion tactical combat level, drones can be synchronized with other ground reconnaissance platform to aid in the aggressive provision of additional target acquisition capabilities, combat warrior's situation awareness and situation understanding. Furthermore, in contemporary times, drones also known as unmanned combat aerial vehicle (UCAV) can be synchronized and be integrated into artillery and other ground-complex-mobile fire and strike platforms to fulfill the role of target spotting and reconnaissance fire delivering either in support of offensive ground forces or distressed troops under heavy fire from the enemy. Countries around the world have begun to consider integrating drones into artillery spotting of enemy forces, thereby improving and increasing artillery strike groups or unit line of sight. Russia, in particular, has trained officers in the use of the Orlan-10 UAV for artillery spotting purposes, thereby increasing the overall capabilities of the artillery platforms [5]. Nigerian military forces shouldn't be spectators in current revolutions in military affairs.

Therefore, this article is written in support of the argument for the decentralization of combat airpower to army tactical air command and control (A2C2), permanently synchronized with Nigerian surface forces in combat zone, and by so doing demonstrate that drones (UCAV) can serve as an alternative to manned combat aircraft (by absenting airmen combat attrition), and leverages as airpower asset in close air support missions in counterinsurgency operations. The Author's analysis of armed drone as constituting and contributing to battlefield reconnaissance, fire/strike complex in support of battlefield operating system, and tactical mission task, demonstrates the need for the army to have a permanent control of tactical airpower required by land forces in combat engagement with the enemy. However, the author recognizes the imperative importance of such mission requiring air force support when needed, the need for Deconfliction between the air force and army would, therefore, require the creation of restricted operation zones (ROZ), though the author did not emphasize the character and nature of what the ROZ should be like in the northeast theater. Finally, this research while making the argument for the decentralization of tactical airpower command and control to the Nigerian army, equally demonstrated the battlefield operating system credentials of drones. Proposition on the nature of air/ground command and control architecture for tactical airpower was equally made.

Thus, the article is structured as follows: the introduction started with exposition on the argument in support for army's control of airpower at the tactical level for arms overwatch and tactical overmatch. It give definition and explanation of command and control as a critical term in the argument for centralization or decentralization. The second section dealt with the debate for and against decentralization, by presenting air force view on the subject, and also the differing views of the army centric. The third section was about a grounded exposition on the nature of asymmetric threat environment and it nature of warfare, this is important so as to place the decentralization argument into a comprehensive strategic context. The fourth section made a case for the decentralization of airpower to Nigerian army command and control, it equally dive into the issue of inthrathetater mobility, though no case was presented for the use of unmanned aerial vehicle for inthratheater mobility. It however argued strongly for the adoption of drone in place of manned combat vehicles. The fifth section made a theoretical case for drone reconnaissance strike/fire complex combat system, positing it effectiveness in theater forces needs for enhanced observation, orientation, decisions, and actions line of operations against that of the enemy's forces. The sixth section of the article presented the effectiveness of drones in the functions of the battlefield operating system. The seventh section presented analogy on the possibility of using complex adaptive system for the efficient synchronization of unmanned combat aerial vehicle system with army's ground combat system. While the last section reached a conclusion of the article on the subject matter on the decentralization of airpower to Nigerian army command and control.

It should be noted that this article relied on secondary data collection.

2. The Debate over Decentralization of Air Power

The first principle of academic excellence in research and argument is to state opposing views as qualitatively as possible, before defending or supporting any side of the divide. In this case, it will be of utmost importance to do justice to the view of the two services involved in the struggle for the control of airpower in a broad spectrum of military operations. Thus there exist the land centric, which this research paper support to a great extent (tactical airpower control for tactical advantage and lethality overmatch of enemy forces), and air force centric, which sees airpower as the exclusive domain of the air force in all spectrum of warfare. However, before presenting the argument on the centralized vs. decentralized control of airpower, it will be important to present the divergence view between the air force and the army on the concept of victory in war, and the force whose utility can bring about the required defeat of the enemy forces. Moreover, the concept of decentralization is not just an argument that exists in the army and air-force divide, but also within the air-force. Succinctly, within the air force, there is the agitation to permit airmen the authority to

take fire release action against a target as against observing and reporting, while superior commander gives the order to strike a target.

2.1. The Argument on Decisive Victory in Modern War

2.1.1. Air Force Centric

Scholars who had attempted to opine on the quarrel between the air force and army on the decentralization of airpower had observed that the disagreement is generic to both forces' differing concept of victory in war. Airpower theorist concept of a decisive strike on a critical target or center of gravity that could result in the total incapacitation of enemy forces ability or will to continue fighting is central to the view of victory in war by the air force. To this end, airpower under the command and control of the air force is the surest way to avoid the heavy cost of war of the trench warfare prone attrition. Therefore, airpower can ensure quick victory and prove to be a game-changer in the battlefield through strategic and operational strike of enemy's center of gravity through diverse strategy and doctrines, of which example would be the suppression of enemy air defenses (SEAD), etc. furthermore, the argument have matured more and way beyond a massive strike at a singular center of gravity to aggressive reconnaissance and targeting of multiple centers of gravity. MAJOR Brian P. O'Neill, argued that most proponents of airpower thought that the fundamental nature and characteristics of airpower, which are flexibility, synergy, persistence, concentration, precision, and most importantly surprise permits the air force the opportunity to accomplish what surface forces couldn't be attained without suffering casualties. It's of this school view that airpower is the decisive force to reckon with in the battlefield [6].

If Clausewitz theory of combat with regards to it center of gravity, which stipulates that the aim of a combat force should be to target the mass of enemy strength that constitute it ability to continue fighting and whose obliteration could result to it surrender is to be considered as sine qua non to victory in war, therefore, it is behooved on strategy to direct military action against the center of gravity. Thus air force theorists relying on this concept of victory in war opined that the air force mission-essential is to achieve a decisive victory for the general body of nations fighting force via the use of airpower. To this end a forced construct was developed upon the notion that unmatched airpower capability under the command and control of the air force can bring unacceptable attrition both materiel and personnel to bear upon enemy ground forces rapidly and effectively to achieve a decisive victory. Thus surface forces are no longer the sole arbiter of victory in war. From this argument, and the various experience of the airforce in combat operations in major high politics, the airforce was made independent from the ground forces (the army).

To airpower centrists, the role of airpower in battle is to attack critical ground and air targets that support enemy war-fighting effort or that are critical to the enemy's force strength. Thus should an enemy force be subjected to an attack from air force mass firepower, it would not just bring a change in the combat power ratio, but also destroy the will of the enemy to continue fighting. Therefore airpower effect on enemy forces is not just lethal but also psychological. The validity of this assumption is still contested to date, but some examples exist to support the notion that strategic and precision airstrikes are critical factors for victory in war. However, Matisek and McPhilamy contended that often, pro-airpower battlefield victory absolutist cites the performance of airpower in operation allied force (OAF), it effects-based approach applied in decimating Iraqi centers of gravity in the Persian Gulf War, and the role of airpower in sanctioning the Serbian government for carnages in Kosovo. Ironically, a key question seems unanswered, which is why victories were too quick to come about from these operations in the absence of surface forces [7].

Consequently, airpower and air force strategic and operational role in combat is to replace the attrition prone contest of control of terrain by opposing ground forces. In a nutshell, the air force assumption of the role of airpower is based on service culture and the appreciation of its perception of the center of gravity. From the American (USA) doctrinal standpoint, it is important to state unequivocally that there is no agreement on a singular concept of center of gravity. The different military organizations had always developed different preferences on the center of gravity question base on the nature of role, capability, doctrine and permissiveness of weapon system. An attempt had however been made to change this phenomenon, though the discussion will not be furthered in this paper.

2.1.2. Army Centric

Army centrists, view air-ground force strength and combat power synchronization as the trademark of the contemporary military operation in a non-linear and battle line disappeared battlefield. If victory is to be attained in the modern military operating environment, warfighting is to be characterized by the amalgamation of air and land assets under the command and control of surface force combatant command. To this end, the air force role in close air support operations and other tactical air missions that support ground force close battle is a distraction or best inefficient.

Surface forces warfighting philosophy in modern warfare is based on the close battle. It is held as the only way to victory in war. Bringing enemy forces to close battle and seizing the initiative and means of tactics, techniques, and procedures of delivering effective lethality via force maneuver to defeat the enemy and control the terrain and the battle-space announced victory in war.

To the army, negotiating today's security landscape demand the decentralization of air power from the air force's command and control role in close air support mission to the army tactical combat command. This land centric view of victory in war is no doubt rooted in army perspective on the Clausewitzian concept of center of gravity [8].

Today's army operation in broad-spectrum demand an air/land combat power, the need to have the sufficient time-

compression to meeting the time-sensitive operational requirement is the very reason the army has renewed the effort. The bitter combat lesson of the Vietnam War and today's fluid military environment had been the major concern of the army mind on combat power based on air/ground mobility, and fire inspired maneuver. There is no gainsaying that military operation from the army perspective is based on its fighting culture and visualization of the battlefield.

2.2. The Argument on Centralization vs. Decentralization

According to Air Marshal Arthur Tedder, Air warfare cannot be separated into little packets; it knows no boundaries on land and sea other than those imposed by the radius of action of the aircraft; it is a unity and demands unity of command [9]. This and many others are the premises with which the argument for the centralization of airpower in the uniformity of command and control of air-men stood the test of time. The argument drew many of its examples from the operational experiment of the world wars and post-world wars linear battles. Earlier air theoreticians were skeptical about airpower attaining its full military usefulness if it was to remain under the control of surface forces commanders. It should be noted that airpower at the beginning of both American and British experiments in the world wars was operationally under the command of surface forces command and control architecture. Thus, the protagonists argued that airpower mission is characteristically different from surface forces traditional warfare both in mission and potentiality. It is argued that while surface forces are mostly tactically concerned with close battle with few meters approximated enemies air warfare is a theater-wide mission, whose concept of warfare exists and is more important at the strategic and operational level of war. Therefore, air task orders commanded by surface forces commander will reduce theater air operation to tactical mission requirements. To the theorists, the consequential outcome of airpower or an airforce controlled by surface forces or other sister services is the dependency of the airforce in the framing of doctrine, force structure, and asset acquisition.

The argument on centralized control is more buttressed and backed up by recent experience in American conventional and quasi-network centric war campaign in Iraq against Sadam Hussein regime, the uniformity of command and control under, "a Joint Force Air Component Commander (JFACC) controlled all fixed-wing assets in theater, including those of other coalition countries. The synergies gained from diverse air forces working together as a team with one commander to focus their efforts played a major role in the victory. During this combat test, the JFACC concept worked, and therefore became the organizational option of choice in the future"[10]. To this end, the centralized of the command and control of airpower assets in the theater of war is argued to be the surest way to a decisive victory.

On the other hand, it is important to note, that argument in support of centralized control of all airpower assets and missions by a central air force command chain was based and justified at the symmetric battlefield environment of the twentieth, and early twenty-first century. If anything can be dangerous to a nation's fighting force, nothing is as repeating a strategy because it worked in the past. The French experience of the past and world war two helps strategies to abstain from this type of mistakes. Thus the argument for the decentralization of close air support mission, and other air tasking order required by the army for arms overwatch, arms overmatch, and surface time-sensitive and dynamic target exist in asymmetrical environment.

In today's military operating environment not only do army's field commanders and soldiers required to master the essential characteristic and utilization of airpower for close battle and other sensitive surface forces mission requirement, it is now required of commanders and soldiers to be culturally savvy, as the current operating environment is more than ever culturally sensitive and complex. So today's army conducts operations in a different strategic and operational environment.

Arm with this new battlefield reality, decentralization protagonists argued that airpower in asymmetric warfare requires a decentralization of command and control from the airforce to army's tactical groups and in response to army's requirement of close air support, and other tactical air task order needed to guarantee tbeaterwide advantage over irregular enemy forces. Equally is the need to achieve depth in obliterating enemy forces' force concentration and diminishing of it force strength.

Philip Sabin, why questioning if contemporary airpower is an appropriate force multiplier in the asymmetric environment, opined that airpower have come to play important role in current asymmetric threat environment to offer a tactical advantage to deployed ground forces, and also to shape the strategic environment of the low intensity of conflict [11]. Therefore, it's established that in today's military operation surface forces need the synchronization of air and land capability to gain tactical advantage, avoid attrition, and permit swift maneuverability in the battlefield. To add, modern airpower in form of unmanned combat aerial vehicles have come to ensure the abstention of airmen casualty in modern battle against any enemy with modest air defense system. Thus, American war department had long recognized the need for a ground force command and control of airpower for tactical advantage early in the world war, by assigning light combat aircraft to surface forces field artillery unit of the infantry and armored division for target spotting and fire adjustment.

The army urge for the development of air-ground forces capability was propelled by technological advancement in electronic avionic assets, the changing strategic environment, and service requirement.

In today's asymmetric environment, the requirement for tactical air task order is more prevalent beyond the close air support, which now includes surveillance, reconnaissance, and tactical air support. The airforce view of overall tactical air task mission is subsided to it strategically, and operational

theater-wide mission of air superiority, and interdictions, while the army defines close air support and other tactical airpower requirements as a need for tactical overwatch and overmatch of surface forces in a close battle. Thus different battlefield psychologies operate between the air force, and the army, justifying the need to allow for a decentralization of command and control of tactical air mission.

Generally speaking, derived from the philosophy of the utility of airpower in a broad spectrum of a military operation and regards to the concept of a decisive victory in battle, the airforce strongly believed that decentralization of airpower to army command and control will only amount to a waste of aviation resources.

The military has a general agreement on the utility of airpower, which is such that whosoever command the air both in symmetric and asymmetric clash of arms has an advantage on the close battle and theater-wide operation. All theorist of airpower, and indeed land power have come to terms with the force advantage provided by airpower force coordination.

In this case, some have coined a term for this concept to mean the command of the air, others see it as gaining air superiority. Thus, there is no disagreement that the first duty of airpower operation is to neutralize the enemy force formation and to grant theater forces the freedom of tempo and speed to accomplish mission tasks, with consideration to force protection. The disagreement is squarely about the command and control of air task order for close air support of army tactical unit, such argument has become important to Nigerian ground forces in the face of Boko haram insurgency in the northeast of the country and the overlays which defined it gray zones (the ungoverned territories of Nigerian neighboring states), as portrayed by Metele battle loss, and combat casualties of many Nigerian soldiers.

Also, the air force does not argue that the army does not require tactical airpower or close air support to meet its field operational requirement, what is argued, however, is that such mission does not require the decentralization of tactical air command and control to army division, brigade, and battalion level. But should be under the control of an air force combatant command. On this notion, the army argued that often the airforce falls short of delivering tactical air task order or close air support at the critical moment required. A delay in meeting close battle air strikes and fire support requirements can be dangerous to combat troop's safety. Metele attack speaks volume of the need of air/land synchronized combat power, which in essence should help combat unit in distress to survive battle damage in a manner that still preserve force cohesion, and the ability to gain ground and hold terrain. The absent of airpower support to 157 Battalion in Metele northern Borno was a disaster in the history of Nigeria's counterinsurgency operation. This research is of the strong opinion that in a fluid and time-sensitive military operating environment, air task orders that support the army's mission task should be permanently synchronized with the army battle groups.

Asymmetric Threat Environment

Figure 1. *Asymmetric Warfare Group.*

War is made up of series of coordinated battles designed by belligerents as part of a larger operation whose objectives is to undermine enemy's course of action and seizing the initiatives of battles with the end justifying the means (as sanctioned by the law of war) of bringing the enemy to total submission. Total submission differs from total annihilation in that submission tends to impose an unacceptable cost of doing battle, while annihilation is the destruction of the enemy's forces. War is a rational calculus of means to an end, and a strategic engagement of force.

The character of force determines the strategic, operational and tactical pattern of force employment, and terms of engagement. Forces modify their tactics, techniques, and procedures of arms maneuvers base on the assessment of the enemy's force metric. Modern warfare has been characterized by asymmetric force structure.

The bad social relation that manifests within states after the end of the cold war and the consequential effect of the proliferation of small arms and light weapons through the activities of international criminal mafia gangs has had a multiplier effect in spreading instability within fragile states of the globe.

Warfare in the 21st century is marked by an unprecedented shift from linearity to nonlinearity in combat engagements.

In an era of irregular warfare, characterized by the affective geographic imagination of fear of terror and the global distribution of terror networks, warfare is now almost totally imbedded in cultural exchange of hostility, and suspicious of the "offensive them" and "victimized us". This emotion is one of the causes Belli that fuels the war on terror, and the geographic push and demographic pull of terror recruitment and compartmentalization of forces. Force planners and combatant commanders are therefore faced with new challenges in force planning and military engagement. It thus means that warfare at the age of violence non-state actors, consideration must be placed on various dynamic factors that inhabit the battlefield. Among which is the decentralization of threat network and its loose nature, the non-distinction between combatant and the civilian populace by irregular forces and the use of civilian population and habitation as a cover against military actions.

Consequentially, military deployment and engagement will move from the deployment of large forces to that of Special Forces to perform a time-sensitive mission, contingency operations, and operations other than war. These non-linearity demands a change in the role and manner weapon system is used on the battlefield. Contemporary intelligence preparation of the battlefield must also account for cultural activities that can serve as a force multiplier or hindrance to

friendly force primary mission task, not just in the core geographic definition of the battlefield but also it gray zones demographic mapping.

Therefore, it's imperative to consider how to design force protection for exposed forces operating in the civilian-populated area, which is open to irregular forces' force maneuver [12].

Secondly, one of the greatest challenges facing military operations in the 21st-century warfare is the disappearance of neutrality or geographic neutrality, enabled by irregular forces use of neighboring countries ungoverned territories to planned attacks and force compartmentalization.

In a traditional framework of conflict analysis or assessment and most special cases arms conflicts between or among states; there exists a clear definition of a state's territorial neutrality. However, the reverse is the case with the conceptualization of the battlefield of the current fourth-generation warfare. The traditional concept of battlefield recognizes a clear geographic definition of neutral territory and a state, the neutral territory is almost non-existent in the current war against insurgent-terrorist. The near non-existence of neutral territory is influenced by the pursuit of sanctuary and force protection from the state's lethal interdiction and direct action by violent non-state actors. This is informed by the juridical limitation place on the use of force in another state's territory without consent. Terrorist utilizes this juridical barrier or international law constraint to compartmentalize leadership structure, logistics, and in some cases direct action groups. Thereby stretching their area of influence or operational influence beyond the lethal reach of the belligerent state.

Thus, fourth-generation warfare demands for new force employment that deals with the reorganization of military asset and force in a manner that arrest the activities of threats in the battlefield and it gray zone, and forces planning of military actions beyond territorial limitation in overt and covert mission task.

Understanding that the existing conflict zone assessment should go beyond the traditional state vs. state belligerence goes a long way in employing the best-suited concept of operation on the war against terrorism.

The current asymmetric battlefields portend a new approach to security, with more emphasis on joint and combine arm operations, regional cooperation, multinational joint task forces and regional intelligence fusion mechanism. This is in particular one of the force structure and formation put in place by the lake chad regional states to fight Boko haram [13].

There is no doubt that regional base counter-insurgency framework could be the most effective in countering insurgency, criminal, and terrorist threat network at a regional level. This is because such threat network are regional in character and utilizes un-governed territory for their operation: be it terrorist financing, IED Warfare planning and logistics, criminal network smugglings and trafficking of people.

Ungoverned or non-neutral territory provides such advantage. Therefore, any meaningful counter-insurgency and counter-threat network strategy must take recognizance of this factor in tailoring its tactics, techniques, and procedure of lethal and non-lethal interdiction in the area of operation and beyond. In a nutshell, military operations must be time-sensitive.

Consequentially, North East Theater of war is an asymmetrical strategic environment for the operation of Nigeria's air-power, due to the uncontested nature of friendly airpower force structures concerning the enemy force's capability. Simply put it is a low altitude threat environment. Therefore, a decentralized command and control airpower like drones bring asymmetric advantage to surface forces in close contact with enemy forces, diminishing the enemy's tactical advantages. Superior airpower will give surface forces technical superiority over Boko haram's outdated or non-existent air defense, and artillery systems.

The emergence of unmanned combat aerial vehicles, which can conduct a stand-off reconnaissance and targeting of potential targets accurately without attritional losses of airmen removes airmen from the danger of been short dawn by enemy's air defense system, thereby depriving enemy's combatant the utility of attritional losses of friendly forces in conducting propaganda.

The above analysis gives an insight about the nature of the contemporary battlefield, the reality imposed on combat operation by the new battlefield resulting from termination of linear battle lines and areas due to emphasis on maneuvering, and rapid dispersion of irregular force, which poses a 360-degree threat to friendly forces. Military planners will be required to continue to plan for the entire spectrum of warfare from high intensity and low altitude counterinsurgency threat environment.

2.3. Making a Case for the Decentralization of Airpower to Nigerian Army's Command and Control

The increase in threat level by various threat networks' belligerence activities within the Nigerian national security environment and geostrategic sphere of interest will necessitate the Nigerian military to increase the level of airpower mission in a standoff action against threats, through synergy, and collaboration amongst sister military organizations. Thus, the emergent of terrorism in the northeast which is characterized as a low altitude threat environment, and high-intensity counter-insurgency operational environment, means that Nigerian airpower capability must be built and prepared to conduct air theater operation in a broad spectrum of the military environment.

The Nigerian constitution empowers the Nigerian air force with the responsibility of defending and protecting its air-space territorial sovereignty. Thus, the 1999 Constitution of the Federal Republic of Nigeria (as amended) provides for the establishment of the Armed Forces of Nigeria (AFN). It states that they shall be adequately equipped and maintained to effectively defend Nigeria from external aggression, maintaining its territorial integrity, suppressing insurrection and performing such other functions as may be prescribed by

an Act of the National Assembly [14].

The Armed Forces Act, CAP. A20 LFN 2004 in Part 1 (4, b) additionally demanded the Nigerian Air Force (NAF) to apply its capabilities in assisting the coordinating and enforcement of international laws, conventions, practices, and customs certified or acceded to by Nigeria government concerning aerial or space activities in the Nigerian air space. NAF responsibilities also include delineating, demarcating and coordinating of all aerial surveys and security zones of the Nigerian air space [15]. Thus the mission of the Nigerian air force is to defend the nation by air through offensive and counter-offensive measures deem fit by the service.

Understandably, the argument for the decentralization of tactical airpower may seem an encroachment on the air force constitutional responsibility. Air forces around the world regard combat air operation in all spectrum of military operation, traditionally exclusive to the force. However, except the air force can assure in delivering an efficient and effective tactical air tasking order in real-time to the army's tactical ground forces in combat engagement, it will be operationally wise to decentralize air power's tactical command and control to army's three tactical combat units (division, brigade, battalion). Moreover, air force resistance to army ambition on the acquisition of close air support task, a requisite for effective implementation of battlefield operating systems will not albeit except policymakers succumb to a superior intellectual argument and the urgency of decentralization in reducing airmen and ground troop's attritions. More so, today's army conventional and unconventional operation doctrine is based on tactical air/land force relative combat power superiority. Army's tactical air/land force capability development is one of the foundations with which decentralization of airpower argument is based.

Constitutional allocation of airpower component of national power to the air force operational authority makes army and navy ambition for command and control of airpower asset and theater operational responsibility a dependency on air force centralized command and control. Requiring an agreement between both forces. Except there is a policy shift from the Presidency and the defense headquarter airpower needs of the army can hardly be met by the current status quo.

The statutory justification of air force centralized control of all spectrum of airpower is currently irrelevance due to the existential fact that such law and practices were made at the time fourth-generation warfare was not the major threat to Nigeria's national security. Today's threat environment is nonlinear and fluids, requiring flexible air/ground engagements by deep operation maneuver forces, and critical targeting groups.

Contemporary military operation inadequacy in tackling Boko haram threat: covert and overt irregular operations in Nigerian North East theater of war and its gray zone, should necessitate the need for real-time reconnaissance & surveillance of all threat activities by ground special forces, and tactical combatant command. This operational requirement of real-time responsiveness can only be assured if tactical air task order is permanently synchronized with ground combat command and unites.

Nigeria's counterinsurgency's area of operation and interest is a large landmark, covering over three northeastern states of Adamawa, Borno, and Yobe. Thus this complex area of operation defines the strategic and operational employment of airpower by the Nigerian air force. The Nigerian air force has been engaged in the aerial bombardment of Boko haram force formations and installations in this vast landmass, which includes the infamous and massive Sambisa Forest, the Gwoza Hills, and the Mandara Mountains. However, often it has also suffered many casualties resulting to the targeting of it mostly un-advanced aerial combat vehicles by Boko haram anti-aircraft weapon system [16].

This vast landmass and the need for the air force to maintain strategic and operational presence against threat has led to a shortfall in the supply of close air support missions to ground forces in a close battle with Boko haram irregular forces.

The battle of Metele serves as a good example where friendly forces under enemy forces fire were not supported by air assault aerial vehicles leading to the battalion tactical group (157 Task Force Battalion) suffering battle damage that resulted to the death of the combatant commander, and the group was unable to hold ground. Thus with the air force occupied at the strategic and operational level of counterinsurgency warfare, the army should control tactical airpower for armed overwatch and lethality over-match against Boko haram irregular tactical groups in close battles.

The argument for army control of tactical airpower asset should not be misconstrued as duplicating air force operational responsibility, in as much as such, decentralization is jeered towards supporting the effective implementation of ground forces operational mission task, without necessarily affecting air force's strategic objectives and battlefield air interdiction's operational responsibility.

Airpower command and control by the army ground forces will normally extend army combat zone area of responsibility, from the traditional ground force combat zone delineation to include areas covered by air reconnaissance & surveillance of enemy's forces. This is required to allow the surface combatant command to effectively operate and act faster than the enemy's command and control's decision-making circle, when initiating tactical decision making for combat engagement to achieve depth. Deconfliction is therefore, needed between the air force and the army's air/ground command.

Interestingly, today's strategic environment and airmen and surface forces operational requirement to reduce both materiel and personnel attrition for winning battle are also amongst the driving force behind the decentralization of airpower argument. Thus it is strategically important for the Nigerian military to reduce combat units casualties to deny Boko haram the tools it needs for propaganda. Survivability of troops in close battle can be ensured through the synchronization of infantry fighting vehicles weapons

platforms and aerial combat asset for 360-degree force protection and tactical advantages.

The end of sequential force operation maneuver in warfare, brought about by American successful parallel warfare concept of operation during the Gulf War, which was facilitated by the superiority of information, fast mobility, stealth, and precision strike of combat power lethality has shared more light on the important role unmanned combat aerial vehicles plays in today's military operation, with regards to the more sensitive missions of close air support operation.

Military perception of the role of unmanned combat aerial vehicle (UCAV) is a demonstration of utmost confidence that UCAV (armed drone) can leverage as future generation close air support platform [19]. Should UCAV serve as a replacement of the role manned combat aerial vehicles play on close air support (CAS), it will be necessary for it to satisfy some operational conditions, ranging from, acquisition and operational cost, survivability, though this research will not be addressing this outlined points.

Consequently, the Nigerian military must strive to follow suit with the American experience and expertise of dominating the battlefield. Therefore, having the freedom of action in implementing courses of action as developed by the military decision-making process.

Interestingly, a medium altitude and long endurance crafty unmanned combat aerial vehicle (UCAV) capable of multispectral target acquisitions and precision-guided munitions weapon system lethality strike can augments Nigerian army surface forces' combat units capabilities and improves it battlefield operating system functionality, avoids airmen attritions by not requiring airmen input, and enhance ground forces personnel and materiel survivability, with more efficiency and effectiveness over manned aircraft.

Moreover, human ingenuity is a requisite in every art of maneuver, UCAV must remain semi-automated, specifically when deployed close to surface maneuvering forces [17]. If fratricide is to be avoided, weapons discharge approval must be an outcome of human decision [18]. UCAV battlefield infrastructure can serve as an efficient air-to-ground decentralized command and control system in pursuit of Boko haram hostile forces in dynamic time-sensitive targeting, and close air support to ground forces hot pursuit of hostiles.

The utility of guerrilla operational art of war by Boko haram makes it difficult to spot enemy forces in a stationary mode. Boko haram forces are dynamically inclined to art of hit and run dispersion within civilian deceptive cover. Making it difficult for manned combat and ISR equipped aircraft to track and target, and when target is acquired the centralized command and control air/ground combat system may delay in giving strike approval to airmen, thereby losing a fleeting opportunity. But as the UCAV battlefield systems role in airpower operation at the tactical level brings combat power efficiency to bear in support of ground forces dynamic targeting efficiency and effectiveness will increase.

Thus, it uses must be decentralized to avoid the problem of delayed weapons strike approval to enhance time-sensitive targeting, and close air support for ground forces.

The nature of Boko haram irregular tactics and clandestine activities in the northeast theater require an army with air/ground rapid response assets to take the battle everywhere, and anywhere the threat shows its ugly head.

The nature and definition of close air support missions make it imperative to fine-tune the line of command and control decentralization point of view. This is because close air actions require communication and coordination with surface forces mobility, it is also a lethal action that takes place near ground forces. Thus close air support should be a combine air-ground fire/strike complex system that is coordinated by the ground force commander.

Close air support must be flexible and timely respond to surface force's needs. A permanent synchronized and decentralized command and control will allow UCAV close air operation near friendly forces, without fear or risk of fratricide. It will also ensure effective integration with artillery, armored, and infantry strike groups.

Furthermore, it will be very important to note that the airpower role in the army's accomplishment of mission task goes beyond the lethality effect of airpower weapon systems to include air power real-time logistic effect on close battle engagement through movement, mobility, and enhanced speed of maneuver. This is what has been termed intra-theater mobility.

Intra-theater mobility of combat unit in tactical engagement serves as a force multiplier for relative combat power and helps to mitigate the effect of battle damage on combat power and battle outcome ratio.

The ability to gain and hold ground, and accomplish mission in an unpredictable combat zone (like the northeast) amidst casualty are an important element in the measurement of the battle outcome at combat unit level.

Modern warfare characterized by irregular operational art, which is made-up of unpredictable attacks of Fabian stratagem, demands a dynamic and time-sensitive intra-theater unit movement. Intra-theater unit movement is tactically important in relieving a battle-damaged unit, from the instantaneous fatigue of combat. Thus, replaced by another unit in tactical engagement with the enemy's forces or moving a unit to a better position while maintaining combat tempo and mission essentials.

Furthermore, an advantageous operational geo-location for a combat unit can change unpredictably, having been affected by the dynamics of conflict. It thus means that the formal geo-location of combat unit forces have become undesirable for the optimization of combat power and operational/environmental advantages. Thus, such a change in combat engagement may demand a time-sensitive change of combat unit geo-location through intra-theater unit movement.

Therefore, intra-theater mobility by nature and purpose has a force multiplier effect on theater operation maneuverability. Nigerian army's operation planners should have it in mind to always design intra-theater mobility operations to meet time

and real-time sensitive demand of operational and tactical maneuver of a combat unit in cross-fire engagement with the enemy forces. The urgency of such logistics' critical requirement should necessitate Intra-theater operational maneuver as a time-sensitive logistic-fused-lethal concept of maneuver warfare and combat engagement whose assets, authorization and command and control must reside with the army, and not the air force [19].

Because the inability to effectively maneuver at the tactical level may cause a combat unit to be battle damage prone to the extent it reduces the effect of combat power, which in turn affects the ability to accomplish missions, gain and hold ground: unable to operate under intense casualty.

This also should necessitate a concern that at such a situation caused by different dynamics of battle it will be necessary for a fresh combat unit to replace the battle-damaged unit through intra-theater mobility operational maneuverability in real-time. In a nutshell, intra-theater operational maneuver helps to offset tactical maneuver groups prone with attrition; both personnel, and materiel [20].

Maneuver warfare in the age of fourth-generation warfare is faced with many challenges, as non-state actors can deploy some high-tech smart weapon systems like heat-seeking missiles that could in real-time undermine friendly forces battlefield operating system, thereby, denying it the freedom of choice and actions it seeks and requires to maintain high battle tempo and accomplished mission tasks. It's important that operation planners and combatant commanders seek to control the assets and have the authorization of intra-theater mobility for a better appreciation of maneuver operation as required in real-time.

Intra-theater mobility further serves as a tactical requirement for the concentration of fire in maintaining dispersion and relieving battled damaged troops whose battlefield operating system may have been damaged beyond fixing. Inthratheater mobility in this case can help to maintain combat tempo or resupply the combat unit with needed logistics to achieve tactical mission task.

It's critical for today's army's tactical mission task because mobility is an important factor in the offensive. For this reason, this article seeks to support army requirement of airpower beyond the close air support reconnaissance and fire strike complex combat system. However, the focus of the research is on unmanned combat aerial vehicles and it's not technologically clear-cut that unmanned aerial vehicles have matured to perform the role of intra-theater-mobility.

In a nutshell, intra-theater mobility synchronized with maneuver forces can serve as a force multiplier in conducting and achieving combat result against an enemy utilizing Fabian strategy armed with game-changing long-range and high operational lethality valued mobile weapon system.

Therefore, Nigerian army does not only need to control airpower for close air support and other tactical mission requirements, but need to also control some level of airpower logistic to enable swift maneuverability of forces in the area of operation and interest.

Drone Reconnaissance, Strike/ Fire Complex Combat System

Figure 2. *Combat Drone.*

Combat is a function of opposing wills and each opposing side modifies tactics, techniques, and procedures to suit the pursuit of an advantage in tactical engagement and in fulfilling tactical mission task, which in series of operational coordination defines and accomplishes the operational art put in place to attain strategic objectives.

In contemporary warfare, with it various complexities and at all level of clash of arms, the use of drone in the implementation of creative and flexible application of means cannot be overemphasized. This is because at the core of tactical application of firepower and other tactical strike capabilities that deliver lethal force (probability of kill, and proportional incapacitation) against the enemy is the essence of understanding and mastering friendly, and enemy's forces objectives, organization, and conduct of operations through reconnaissance and surveillance. Drones provide the technical capabilities and firepower to perform such combat operations.

Drones as remote sensing unmanned vehicles serve different airpower purposes in the theater of operation. Built to conduct reconnaissance, intelligence, surveillance, and target acquisition (RISTA); battle damage assessment (BDA). Used by the military organization in carrying out above stated missions in support of commander's critical information requirement, specific information requirement, priority information requirement, and friendly forces information requirement; drones have proven to be effective at all level of warfare.

Drones are significant technical capabilities in the military decision-making process, and tactical decision making process of any type of force operation. So far, such missions involve spotting enemy's positions and embarking on close air support, and battlefield air interdictions.

In a relatively low altitudes theater of war, drones can be effective in strategic air missions. Furthermore, drones can perform roles beyond the RISTA and BDA mandate, it can serve as a reconnaissance fire/strike combat complex as a subset of theater air-ground fire support systems. In time-sensitive targeting dynamisms, drones can operate a stand-alone observe, orient, decide, and act line of operation (OODA loop) for tagging, tracking, collecting and targeting

high-value targets in the theater of operation and its gray zones.

There should be mostly three lethal or traditional military considerations in designing a drone reconnaissance strike and fire complex system as a lethal counter-terrorist time-sensitive targeting system. And these are the strategic considerations, operational effect on a high-value stationary targets, and the tactical effect on fleeing target of opportunity after suffering losses on tactical engagement.

The drone has in 21st-century warfare proved to be a reliable technical capability capable of delivering a complex strike and fire against a dynamic target in real-time sensitive mission essential. This is through distance command and control observe (via surveillance and reconnaissance), orient, decide, and act (compression of the kill chain).

While all drones are not designed to deliver firepower and strike capabilities, it has become imperative that such use of drones be considered and deployed at all levels of warfare due to the time-sensitive nature of the spectrum of combat operation in the contemporary operating environment.

Strike/fire complexes capable drones must now be considered mission essentials as critical technical battlefield infrastructures that support the effective implementation of the functions of battlefield operating systems.

A reconnaissance strike complex system is a weapon platform designed for the coordinated employment of high-precision, long-range weapons linked to real-time intelligence data and precision targeting provided to a fused intelligence and fire-direction center, while reconnaissance fire complex is the tactical form [21].

Thus, a drone or UCAV reconnaissance fire/strike complex combat system can be defined as drone's stand-off attack of ground target incorporating observation orientation decision, and action line of operation to attack long-ranged enemy forces, and assets, and at the same operational time provide tactical fire support for ground forces in close battle, under the command and control of army's tactical group command.

It's a combat system capable of using air power to disorient target in a way that provides 360-degree force protection to owned forces in close battle: permitting fire maneuverability, and survivability.

In a nutshell, it is "flying artillery" in support of the ground force's operational and tactical mission tasks. In sum, army drone's reconnaissance fire/strike complex combat system is maneuver fire support and air interdiction whose lethality is capable of destroying targets from the air in support of ground forces combat system missions.

Remotely sensed unmanned aerial vehicles armed with battlefield capabilities in area of reconnaissance, intelligence, surveillance, and target acquisition (RISTA); battle damage assessment (BDA), and fire/strike capability, will aid the attainment of battlefield objectives, and contribute to the flexible application of accurate battlefield intelligence, critical to defeating the enemy at any level of warfare.

Accurate information of enemy positions, weapon systems, force organization before the commencement of battle and the capability to identify enemy maneuver forces intent in real-time in a battle are critical requirements in appraising and executing surface forces maneuver.

Real-time air reconnaissance provides the commander with the needed dynamism and flexibility in dealing with real-time battlefield challenges. Division, brigade, and battalion commanders need the information that an unmanned aerial vehicle (UAV) unit could provide to maintain the necessary flexibility and agility on the battlefield.

Unmanned combat aerial vehicles from experience have demonstrated battlefield capability in performing broad spectrum air mission task, ranging from ISR/target strike required in TSTs circle, strategic, and operational attack functions (SEADs), and the most sensitive air tactical task operation of close air support (CAS).

Presently, there exists a shortage of air-power capability at the theater tactical level (Northeastern Nigeria theater), due to air force command complex role on other air operations required in maintaining air superiority and obliterating enemy's forces in the operational and strategic level.

Therefore obtaining tactical reconnaissance, fire/strike capability in support of tactical mission task is subjected to ground forces traditional intelligence gathering system, which is not equipped with long-range RISTA.

This very shortfall in the intelligence collection and combat power, undermines commanders' and forces situation awareness and understanding. It also deprives the intelligence preparation of the battlefield (IPB) its needed intelligence collection dynamism in scheming for force maneuver.

In contemporary time, counterinsurgency theater strategy require the need to clear, hold, and build a post-conflict environment through the enforcement of the acceptable order. The synchronization of air/land reconnaissance, fire/strike capabilities at all level of modern warfare is therefore, essential.

Since Air operation provided by manned aircraft is mostly short of real-time requirement of ground forces close air support and attacks on follow-on forces it is not suitable or dependable enough to be part of the fundamental force structure of the ground forces tactical art of maneuver, a combat drone unit must be synchronized with force structure at the tactical level.

Drone reconnaissance, fire/strike complex OODA LOOP when synchronized with surface forces commander tactical decision making OODA LOOP create air/ground synchronization matrix, which serves as a force multiplier in enhancing combat plan and execution flexibility. The drone OODA loop should be seen as an inner OODA loop within the ground commander's OODA loop.

Drones enanled observation, orientation, decision, and actions line of operations ensures that the commander's tactical decision making processes is a continuous and cyclical in process..

In any conflict, the actors who can consistently and effectively cycle through the decision circle (OODA loop) faster, can maintain a higher tempo of operations, and gains an ever-increasing advantage with each cycle. Moreover, the slower an actor falls further and further behind in his actions

and becomes increasingly unable to cope with the deteriorating situation, with each cycle, the slower actor's actions become less relevant to the true situation and become increasingly ineffective [22].

The objective, therefore, is to achieve depth, through the synchronization of air/land forces capability to compress time, and space in applying combat power to gain tactical overmatch against enemy's course of action, and intent.

Depth affords the commander the ability to conduct actions across the battlefield to include sustaining momentum and focusing combat power throughout the battlefield. Depth orients on time, distance, and resources. Depth requires the commander to make time-sensitive tactical decisions that provide enough time and distance to maneuver combat power and resources to achieve victory. This requires synchronization and takes into account the second and third effects of tactical decisions [23].

Battlefield's continuous reconnaissance and counter-reconnaissance intelligence update will aid the fast implementation of the commander's OODA loop decision cycle. Thus, if undermined, the commander's ability to control the events of tactical engagement will be wanting. In the final analysis, Synchronized air/land continuous reconnaissance and surveillance exploit the battlefield operating system's effectiveness to achieve devastating superior combat power at the pivotal point of engagement with enemy forces.

2.4. Drone (UCAV) Reconnaissance, Fire/Strike Complex Combat System' Battlefield Operating System Credentials

Figure 3. *Battlefield Operating System.*

The influence of air power on ground combat, with regards to the concept of close air support and other tactical air mission like reconnaissance, intelligence, surveillance, which constitute amongst a part of, and also enhances other parts of battlefield operating system, like survivability and maneuverability adds strategic, operational, and tactical flexibility to surface force combat power effectiveness.

The operational and tactical mission task in-built of the drone reconnaissance fire/strike complex combat system prepares it to perform a cycling role in the battlefield operating system in conjunction with other ground forces intelligence, and lethal mission capable assets.

To begin with, it is the uncontestable role it plays in the intelligence battlefield operating system when synchronized with dispatched long-range reconnaissance team, and close access target reconnaissance platforms for situational awareness and on-call fire and strike against an unscheduled and fleeting target of opportunity that made it an irresistible asset of BOS.

At this point, it will be of utmost importance and for detail analogy of this complex combat platform, and also for a better understanding, to introduce the concept of battlefield operating system, and to demonstrate with analysis the effect of drone reconnaissance, fire/strike combat system in the battlefield operating system, thereby proving UCAV credentials.

A definition of Battlefield operating system (BOS) suffice it to be *"the capability to plan, direct, and synchronize intelligence, surveillance, and reconnaissance (ISR) operations; collect and process information; produce relevant intelligence; and disseminate intelligence and critical information in an understandable and presentable form to those who need it, when they need it. Battlefield operating system is made up of seven operating systems, which are Intelligence, maneuver, fire support, air defense, mobility/counter mobility/survivability, combat service support (CSS), and command and control that enable commanders to build, employ, direct, and sustain combat power"[24].*

Battlefield operating system deals with seven major functions of battle, and drone (UCAV) can perform critical functions within five of the seven subsets of battlefield operating system, which will be outlined and explained below:

1. Intelligence
2. Maneuver
3. Fire support
4. Air defense
5. Mobility and survivability.

Intelligence primarily involves the gathering and evaluation of information through sources available to commanders for the proper planning of the operating environment, which supports mission planning and execution. A drone provides real-time intelligence on all types of targets on the battlefield, both mobile and static.

Using imagery and multispectral target acquisitions, drones can provide information about threat movement, installations, training fields, and information on the physical environment that supports the commander's critical information required in developing its forces course of action.

This is done through reconnaissance, intelligence, surveillance, and target acquisitions (RISTA). Furthermore, the battle damage assessment or analysis capability and functions of drone permit the commander to evaluate mission success, thereby ensuring the cyclical continuity of the mission execution cycle; a critical component of the intelligence of the battlefield operating system.

Maneuver entails the position of forces in an advantageous

location to enable it to function effectively against a threat, it also involves the employment of direct fire weapon system, and explosive devices against enemy forces, facilities, and weapon systems. Armed drones are critical at providing and employing reconnaissance, strike/fire capability directed towards the obliteration of enemy forces, weapon systems, and command and control before making contact with own troops in close battle.

Thus, it allows for swift maneuverability and close battle interdiction of enemy forces. One of the major obstacles to ground troops in counter-insurgency is the unforeseen terrorist ambushes that inflict casualties to troops on a mission. This terrorist attacks often damage troops combat power to the extent it becomes difficult to attain mission task, thereby failing to hold ground. Drone (UCAV) can negotiate terrain through aggressive reconnaissance, surveillance, and targeting of enemy's ambush teams. The success of this will enable forces unhindered mission task accomplishments.

Fire-support is the coordination that exists between various participating elements with fire support officers, it ensures that the rule of engagement is followed, and equally deals with the identification of cultural properties and civilian concentration, and amongst other things considers the psychological effect of course of action operation on the civilian. Drone provides on the spot imagery information or intelligence that helps combatant commanders direct close battle operation to avoid civilian casualty through battlefield visualization, and when civilian battle damage might have occurred, it gives real-time information to the commanders, and the human terrain unit to assess the damages through battle damage ratio analysis. Therefore providing strategy to navigate Through civilian populace in a manner that ameliorate the injury suffered to avoid bad blood between civilians and theater forces.

A drone is capable of identifying cultural properties, and civilian concentration, which helps commanders plan for direct fire operations in built-up areas.

Air-defence is a measure adopted to ensure force protection of theater combat units against enemy aircraft manned or unmanned, and other mobile weapon system (surface to air, surface to surface missiles). Apart from providing close air support by attacking land enemy forces unit and installations, drones can perform counter-air attacks against enemy aircraft. While Nigerian northeast battlefield may be classified as a low altitude threat environment, in recent time drones have appeared as ISIL air asset in doing battle against Syrian, and Iraqis American backed forces. To ensure no appearance of any technical surprises in the battlefield the deployment of drones in the northeast theater will serve amongst other things the purpose of air-countermeasure against ISIL affiliated Boko Haram's air interdiction of Nigerian troops through drones.

Mobility and survivability are measures put in place to ensure no hindrances on the advancement of troops and Special Forces towards the target and accomplishment of a tactical task. It is the effort towards denying the enemy freedom of movement in the theater. Protection of own forces from the enemy's intelligence gathering, and effect of the enemy's weapon system.

Drone (UCAV) has proven to be effective at close air support, which entails denying the enemy freedom of movement while permitting the same to theater forces, destruction of enemy assets (materiel, command and control, and weapon systems).

Therefore the role of a drone in ensuring mobility and survivability should not be overemphasized. The above analogy proves the battlefield credentials of drone reconnaissance, strike/fire complex combat system in support of the battlefield operating system, which is a means by which commanders bring combat power to bear on the battlefield.

2.5. Complex Adaptive Architecture for Unmanned Combat Aerial Vehicle and Manned Ground Combat Vehicles

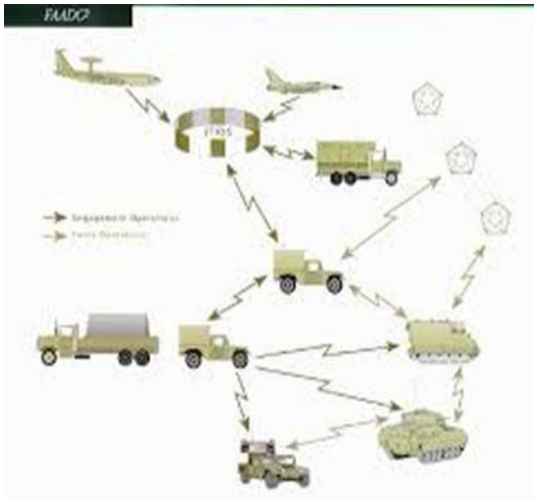

Figure 4. *Air/Ground Combat System Architecture.*

Having proven the importance of unmanned combat aerial vehicles at the battlefield tactical level, especially its role in the battlefield operating system, close air support, and the tactical decision making cycle. It is necessary to draw up a design of some recommendations of what command and control architecture should be considered that for effectiveness in the battlefield. The best way to synchronized with ground combat vehicles and weapon systems, else failure is suspect. At this junction, I proposed a complex adaptive architecture for an effective and efficient drone reconnaissance, strike/fire complex combat system.

Complex adaptive drone architecture will responds to theater complex need in coordinating and synchronizing unmanned combat aerial vehicle with manned ground generic force combat systems. This will help to fulfil the battlefield operating system.

The difficulty in implementing anti-access and area denial theater strategy against irregular enemy combatants in Nigerian vast geographic territory has shone the urgent need of tactical air assaults asset by ground generic combat unit (as argued above), through a complex adaptive tactical C2 architecture synchronized with ground generic forces command and control to create a ring of reconnaissance

fire/strike complex range covering all area of responsibility and area of interest in real-time.

Such a command and control architecture should enables the effective implementation of super camp theater-strategy through all-round real-time effective close air support for mobile task force units, and dynamic time-sensitive targeting of threat activities in the asymmetric battlefield of the north-east.

Irregular forces complex actions represents a fleeting opportunity that can only becaptured by a complex adaptive battlefield reconnaissance a and strikes systems. Thus, a dynamic battlefield demands dynamic and complex adaptive air/ground command and control architecture to satisfy army requirement for real-time targeting platform provided by a mix of air and land targeting combat assets under army command and war culture.

Unmanned combat aerial vehicles and ground combat vehicles when synchronized represent a complex system at a decentralized command and control level.

In this light, complex adaptive command and control architecture should involve the systematic synchronization of unmanned combat aerial vehicle systems with ground combat system under a singular warfighting culture, and at a level that effectively implement military operation on the close battle.

In the final analysis, UCAV and GCV at the army level will require a team of experts trained to operate both systems in real-time to provide a near all source intelligence induced common operating picture, close air support, and force protection to ground forces.

3. Conclusion

What can be deduced from this study is that to ensure the acceleration of theater forces dominance of the battlefield geographic stretch, there is a need to embark on a new combat system that befits the current army's required combat power.

This system will be made-up of the manned and unmanned combat system. Such a system will meet the battlefield operating system requirement for the efficient projection of power in the battlefield, and more importantly at the intelligence, maneuverability and survivability, and force protection subsystems of the battlefield operating system.

For these reasons, the manned and unmanned systems will be made up of unmanned combat aerial vehicle synchronized with light infantry fighting vehicles, Mine-Resistant, Ambush-Protected (MRAP), and self-propelled artillery as the new warfighter system in a close battle against insurgent terrorist in the northeast theater, and its gray zones.

Combat lesson learned so far from the metal battle and others, where Nigerian ground forces suffered heavy losses of personnel and materiel assets to Boko haram firepower, mostly due to the shortfall of army's fielded combat system, demand that the army embark on the development of a ground combat system concept directed towards building a versatile platform made up of fully synchronized Mine-Resistant, Ambush-Protected (MRAP), light infantry fighting vehicles (with emphasis on lethality and mobility, which are equal to survivability), unmanned combat aerial vehicles, and self-propelled artillery at the unit level force formation. The force strength and combat power that can be derived from this formation will no doubt meet the spatial and temporal requirement to deal a decisive blow to any type of enemy forces on close contact with theater forces. It also gives friendly forces the capability to act first before the enemy and to disorient the enemy's decision cycle.

The efficiency and agility of force this new system brings to bear in the army's operational and tactical mission task will ensure adequate adaptability of ground combat forces in an ever non-linear battlefield of the northeast.

Today’s combat troop to task requirement is shifting from tactical and numerical deterministic induced combat power relation to a small, but smart force power projection with a focus on tactical advantage and lethality overmatch of enemy forces through high mobility and maneuverability. A combat power relation based on improving small unit combat power, maneuverability and survivability, made possible through real-time information synchronization of ground combat and aerial combat system brought to bear in close battle against an enemy forces unit will be a game-changer in favor of friendly forces objectives.

The army cannot afford to engage in attritional warfare with an enemy whose political leadership is undemocratic; this is because while the state system political process is responsive to democratic opinion and votes, the enemy is immune from it.

Any perceived failure of the political leadership to provide security could lead to a change of government. The event at the battlefield has a political consequence at the state and national levels. Therefore, mitigation of tbeater forces attrition must be an important aspect of theater strategy. There is no better way to ensure survivability than to equipped troops force protection with a 360-degree ring of fire provided by drone reconnaissance, fire/strike complex combat capability under army's tactical groups' command and control.

References

[1] Ian Horwood, 2006. *Interservice Rivalry and Air Power in the Vietnam War. Combat* Studies Institute Press Fort Leavenworth, Kansas.

[2] Goldberg Alfred, and Lt. Col Smith Donald, 1971. *Army-Air Force Relation: Close Air Support Issue,* A Report Prepared for the United States Air Force Project Rand, Rand Santa Monica, CA 90406.

[3] Major Gerber K. David, 1999. *Adaptive Command and Control of Theater Airpower,* School of Advanced Airpower Studies, Maxwell Air Force Base, Alabama.

[4] Krishnan Armin, 2015. *Mass Surveillance, Drones, and Unconventional Warfare,* Behemoth a Journal on Civilization, Volume 8 Issue No. 2.

[5] Lester W. Grau and Charles K. Bartles, 2018. *Changing Character of War*, Centre Pembroke College, University of Oxford, With Axel and Margaret Ax: son Johnson Foundation.

[6] MAJOR Brian P. O'Neill, 2011. *The Four Forces Airpower Theory: a Monograph*, School of Advanced Military Studies United States Army Command and General Staff College Fort Leavenworth, Kansas.

[7] Jahara Matisek and Jon McPhilamy, 2018. *Why Airpower Needs Landpower*, Modern War Institute, West Point.

[8] Clausewitz, Carl Von (1780–1831), *On war,* Azar Gat.

[9] Arthur William Tedder, 1948, *AirPower in War.* London: Hodder and Stoughton.

[10] Meilinger S. Philip, 1995. *10 Proposition Regarding Air Power*, Air Force History Museums Program.

[11] Sabin Philip, 2017. *AirPower in Asymmetric Warfare*, International Forum on War History: Proceedings.

[12] Ibili Celestine N., 2019. *Countering Threat Networks in Nigeria's Geopolitical Sphere: Libyan vacuum, and cultural intelligence as a panacea,* Academia.com.

[13] Usman A. Tar, and Adejoh Sunday, 2017. *Military Alliance and Counter-Terrorism in Sub-Saharan Africa: The Multi-National Joint Task Force in Perspective,* Covenant University Journal of Politics & International Affairs. Vol. 5 No. 2, Dec. 2017.

[14] Constitution of the Federal Republic of Nigeria [Nigeria], Act No. 24, 5 May 1999, available at: https://www.refworld.org/docid/44e344fa4.html [accessed 31 December 2020].

[15] Armed Forces Act, CAP A20 LFN 2004.

[16] Fulan Nasrullah, 2019. *Assessing the Nigerian Air Power Employment in Counter Insurgency Operations.* Conflict Studies and Analysis Project.

[17] Bartley Michael L., 2002. *Unmanned Combat Aerial Vehicles: A Close Air Support Alternative.* Air War College Resident Program Air University Maxwell AFB AL.

[18] Major Edwards, Jr. O. Lennie, 1990. *A Role for Unmanned Aerial Vehicles on the Modern Tactical Battlefield: Monograph,* School of Advanced Military Studies United States Army Command and General Staff College Fort Leavenworth, Kansas.

[19] Bergen, P. L., Rothenberg, D., 2014. *Drone Wars: Transforming Conflict, Law, and Policy.* Cambridge University Press, New York, NY.

[20] U.S Joint Force Command, 2019. Joint Publication 3-17: Air Mobility Operation, Joint Doctrine Command, Department of Defense, USA.

[21] Lester W. Grau and Charles K. Bartles, 2018. *The Russian Reconnaissance Fire Complex Comes of Age,* Changing Character of War Centre Pembroke College, University of Oxford With Axel and Margaret Ax: son Johnson Foundation.

[22] Hammond, G. T., 2001. *The mind of war. John Boyd and American Security*. Washington: Smithsonian Press.

[23] Jensen, E. & Brehmer, B., 2005. *Sense-making in the fog of war. An experimental study of how command teams arrive at a basis for action.* Paper submitted to the 10th Command and Control Research and Technology Symposium McLean, VA, June 13-16.

[24] US Army, 1993. FM 41-10: Civil Affairs Operation, US Army Publication, Department of the Army, USA.