UNMANNED AERIAL VEHICLES AND CONTEMPORARY STRATEGY MAKING

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Abstract: *Unmanned aerial vehicles (UAVs) have become signature weapon in the post 9/11 era and are used by the developed countries for civilian and military purposes. Developing countries are also engaged in the process of acquiring UAVs either through purchasing them from developed countries or through manufacturing their own indigenous drones. This proliferation of drones' technology has made it imperative to study their usage and the features which are making them so attractive for the strategists of the modern times. This study analyzes the use of drone's technology in the present times and the strategy of employing drones as a means of warfare from military perspective. Analysis reveals that drones or UAVs are used not only for surveillance and reconnaissance, but also for hitting the desired targets.. Being a citizen of a country which is experiencing drone attacks, it is need of the hour to study the main features of drones and the pros and cons of drone warfare by evaluating the role of UAVs in contemporary strategy making. Though the technology of unmanned warfare is not a new thing, but the use of drones for killing the terrorists in the ongoing war on terror has raised its significance. Empirical findings indicate that drones with their primary functions of intelligence, surveillance and reconnaissance are the ultimate weapon of choice for unconventional warfare without risking soldiers' lives and to withstand dull, dirty, and dangerous environments with persistency.*

Keywords: unmanned aerial vehicles, unmanned warfare, national sovereignty, ground control system, surveillance

Introduction:

The unmanned aerial vehicles (UAVs) have become the ultimate need of the modern militaries for coping with non-traditional nature of warfare in the 21st century. Warfare in the contemporary

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era is not in the well-defined battlefields; rather it is mostly between different state and non-state actors. These non-state actors are generally the terrorist groups who have their networks spread in various countries. These violent actors are mingled in the civilian population and are, thus, difficult to be spotted and targeted. For that purpose, UAVs or drones are the ultimate weapons of choice, being recommended by the modern strategists. Due to their distinct features of precision and high endurance as compared to the manned aircrafts, they have proved to be an efficient tool in the global war on terror and are now affecting the contemporary strategy making by transforming the nature of warfare. According to Clausewitz, political goals and policies determine the character of war and consequently policy forms the frame in which military strategy is shaped. But now, with UAVs, it is technique which has begun to determine the strategy.

Moreover, in his book 'Wired for War,' Peter W. Singer says that the change is not only in the way how military strategy is shaped, but it is also in the politics, economics, laws, and ethics which, in one way or the other, are related to war. This change is being driven by the techno-scientific revolution, and the future of warfare lies in this change– the main part being played by Information and Communications Technology(ICT) which is also referred to as information warfare and the advanced, precise, and sophisticated unmanned systems. The invention of remote controlled unmanned vehicles has generated the concept of virtual war, a form of warfare in which there is a time and space separation between the attacker and the target, and the war is experienced by hitting the visual images representing the intended targets. This virtual warfare creates new realities, and, thus, needs new strategies to deal with these realities. Unmanned warfare is one of these new strategies which are being used by the modern strategists in the 21st century.[1]

Unmanned Warfare is the term used for the strategy in which the war is fought in such a way that it does not involve direct human encounters but remote controlled vehicles are engaged in the combat. These remotely piloted vehicles are called drones or UAVs. UAVs are the most commonly used unmanned vehicles which are named as

[1] Peter Warren Singer, *Wired For War* (London: Penguin Books, 2009).

drones due to their resemblance with the male bees (drones) owing to their humming sound and that they are stingless and do not produce honey. Likewise drones are pilotless and dependent on their operators. Hence, UAV is an aircraft without a human pilot on board. Its flight is controlled either autonomously by computers in the vehicle or under the remote control of a pilot on the ground or in another vehicle. An unmanned aerial system includes one or multiple UAVs (all of the same model but not necessarily), the ground control system (GCS), data link, and sensory array on board, vehicle, and the terminal for receiving data from the vehicle. Specific names such as Predator, Raven or Shadow refer not only to the vehicle but to the system as well.[2]

Like Unmanned Ground Vehicles (UGVs), the UAVs also have dual applications: Firstly, they can be used for reconnaissance without endangering pilots. Secondly, they are capable of carrying missiles and other weapons. Unarmed drones are used for locating and identifying the enemy targets. Another important function of unarmed drones is to serve as aerial targets for piloted aircraft during their training missions. Some reconnaissance UAVs (e.g., the Shadow) can be launched by a catapult and is capable of staying aloft for whole day. The most widely known armed UAVs include the Predator, which comes in the category of Unmanned Combat Air Vehicles (UCAVs). It can be equipped with Hellfire missiles and can navigate autonomously towards targets specified by GPS coordinates, but the final decision about releasing the missile is to be made by a remote operator.

Origin and Evolution of UAVs

The origin of UAVs can be traced back to19th century even before the first manned flight in 1903. But the history of UAVs as a weapon of war is marked by inconsistency and periods of stagnation. It was not until the Vietnam War that drones had a significant impact on military operations. Afterwards, Israel made significant employment of UAVs in Yom Kippur war. Now the drones have become an integral weapon used by the USA in the global war

[2] Ibid.

against terror. The drone strikes are being conducted in Pakistan, Somalia, and Yemen to kill the terrorists. The first military use of UAVs was for reconnaissance and communication, which is still in practice. In WW1, US Army Aviation was interested in use of drones because of their ability to deliver weapons to a heavily defended target area without having to risk any harm to the pilot. But it wasn't successful that time. During WWII, UAVs were used by different countries as they were deployed in WWI.[3] Moreover, in 1960, U-2 reconnaissance manned aircraft was shot down over Soviet Union. It led to an immediate requirement for development of reconnaissance UAVs. The political ramifications of the shot down of manned aircraft along with needs of Vietnam War led the US leadership to recognize the potential use of drones. In 1961, the US Air Force ordered a reconnaissance version of fire bee target drone. By 1964, a large number of Lightening Bugs were serving with distinction in Vietnam War. The introduction of UAVs into military service had a promising start, and now they form an essential part of the armory for any war, especially given the asymmetric nature of the recent conflicts making ground combat increasingly treacherous. Having started by carrying out simple functions and then developing into multipurpose aircrafts, UAVs have now become specialized for many functions. There are four key drone systems currently in use. They are Rq-2 Pioneer, Rq-5/MQ-5 Hunter, MQ-1 Predator, and RQ-4 Global Hawk.[4]

The UAVs of the future can broadly be classified into three categories: high-altitude long endurance (HALE) surveillance, combat, and miniature spy UAVs.[5] Whereas the Global Hawk can fly for 24 hours consecutively, the future HALE UAVs are able to stay aloft for weeks or even months at a time. Drones are getting smaller and more agile to enable the combatants to gather intelligence from

[3] Jack Miller, "Strategic Significance of Drone Operations for Warfare," in *E-International Relations* 9 (2013), http://www.e-ir.info/2013/08/19/strategic-significance-of-drone-operations-for warfare/.

[4] R. Schaefer, "Unmanned aerial vehicle reliability study," *Office of the Secretary of Defense, Washington, DC* (2003).

[5] Berenice Backer, "UAV evolution – how natural selection directed the drone revolution," *Army Technology* (2012).

areas which are otherwise not accessible, like in buildings and through tunnels. Designers of the drones often take inspiration from the nature for producing tiny UAVs that can hover, perch, or dart forward (e.g., the surveillance Hummingbird and the Dragonfly – both fly like their namesakes from the natural world.)[6]

Warfare in the 21st Century and the Role of UAVs

UAVs are being considered as the most suitable tool for network centric warfare. Network Centric Warfare (NCW) has become order of the day in today's age of unconventional and asymmetric warfare. It is a warfare strategy based on information sharing via a robustly networked force. It creates situational awareness which eventually leads to success of the mission. The ubiquitous nature of drones and their specific feature of persistency and existence in the environment, which is not accessible due to physical limitations of human beings, have made them the ultimate weapon of choice to be used by the modern strategists.

In contemporary times, the importance of Intelligence, Surveillance, and Reconnaissance (ISR) has increased, and, consequently, the significance of UAVs has remarkably increased – ISR being their primary function. They provide full motion video (FMV) and imagery and sensor information to increase the situational awareness of the commanders/operators present in the ground control station. With increasing sophistication UAVs, are now able to provide strike capabilities, air interdiction, and aerial communications relay.[7] NCW provides an operational advantage by providing relevant information to the right place, at right time and in the right format. UAVs are the perfect means to perform these functions in an efficient manner, so they are the prime tools for being used in network centric warfare. They need to be incorporated in a network, where they can effectively communicate with others, thus forming an Unmanned Aerial System (UAS). For this purpose, they need to be plugged

[6] John-David Bloom, *Unmanned Aerial System : A Historical Perspective* (Kansas: Combat Studies Institute Press, 2010).

[7] Duane Carney, *Unmanned Aircraft Systems Role in Network Centric Warfare* (Carlisle Barracks: US Army War College, 2008).

directly into the network. The information dissemination of UAVs provides an important contribution to achieving the situational awareness of the battlefield.[8]

Methodology:

For analyzing the role of drones in the contemporary strategy making, a survey was conducted and a total of one hundred and twenty two completed questionnaires were collected, resulting in a response rate of 81.33%, representing five distinct cities (Lahore, Islamabad, Peshawar, Sargodha and Karachi). 72.13% of the respondents were males and 22.87% were females. The questionnaire was designed to garner the response of professionals (air force and army officers), researchers (PhD scholars), educationists (specialists of International Relations and Strategic Studies) and journalists about the strategy of unmanned warfare, military use of drones, the revolutionary potential of drones, the autonomy issue, productivity of drones and the future of drones in military.

Table No1: Increasing Development of Drones Shows that their Pros are Greater than their Cons

S. No.	Options		No. of Responses	Percent	Valid Percent
1	Valid	No	30	24.6	24.6
2		Yes	92	75.4	75.4
		Total	122	100.0	100.0

UAVs are being developed by all the technologically advanced countries on priority basis. The increasing proliferation of this technology justifies its claims of being the signature weapon of the 21st century. Even though they are being criticized by some schools of thought but the fact remains that they are being developed day by day. More and more countries are acquiring this technology in order to equip their armies with the unmanned aerial systems.

In the survey, 75.4% of the respondents agreed with the notion that despite the increasing criticism of drones, their use is increasing day by day, and more and more sophisticated drones are being designed. Hence, so it means that their pros are more than their

[8] Ibid.

cons. While 24.6% of the respondents disagreed showing that although drones have many negative aspects, but the gains outweigh the glitches as described by Peter W. Singer in his book *Wired for War.*

Table No2: Drones and the Issue of Blind Vulnerability of Soldiers in Counterinsurgencies

S. No.	Options		No. of Responses	Percent	Valid Percent
1	Valid	Agree	99	81.1	81.1
2		Disagree	23	18.9	18.9
		Total	122	100.0	100.0

In counterinsurgencies, blind vulnerability of the soldiers is major issue faced by the armies involved in operations. The hit and run tactics of guerilla fighters involved in insurgencies are very difficult to overcome by using the conventional means of warfare. Moreover, in some cases, the insurgents are mingled in the local population and most of the times they enjoy the support of local people. Under these conditions, it becomes very difficult to conduct counterinsurgency operations, and the vulnerability of the soldiers increases.

The most significant and distinguished feature of the drone warfare is safety of the pilot, which has always been a major issue in aerial warfare. One of the key attributes of drones is described as their visual capability, which helps to overcome the blind vulnerability of soldiers involved in counterinsurgency warfare. In the survey, 81.1% of the respondents agree with this notion while 18.9% disagree.

Table No 3: Comparative Analysis of Civilian to Militant Deaths in Drones and Other Forms of Strikes

S. No.	Options		No. of Responses	Percent	Valid Percent
1	Valid	Lower	63	51.6	51.6
2		Higher	34	27.9	27.9
3		Equal	25	20.5	20.5
		Total	122	100.0	100.0

The issue of collateral damages and civilian deaths has always been a question mark on the efficacy of drones. They are claimed to be very precise but collateral damages cannot be ignored. Moreover,

there is no accurate data available regarding the collateral damages. The data which is available from different sources is not authentic, and the difference between the available figures further puts a question mark on authenticity of the data. This is the major reason behind the criticism on drones, having an increased ratio of civilian deaths in the so-called signature strikes.

It is also a fact that there are civilian deaths in other form of strikes as well such as air raids and ground operations in which remote controlled or unmanned vehicles are not used. 51.6% of the respondents are of the view that ratio of civilian to militant deaths in drone strikes is lower than other form of strikes; 27.9% are of the view that the ratio is higher than other forms of strikes. While 20.5% of the sample regards the death ratio in both cases to be equal.

Table No 4: Unmanned Warfare: An Asymmetric Solution to an Asymmetric Problem

S. No	Options		No. of Responses	Percent	Valid Percent
1	Valid	Agree	83	68.0	68.0
2		Disagree	39	32.0	32.0
		Total	122	100.0	100.0

Hopson in his article, "The Drone Revolution,"[9] describes the transformational nature of drones. Drones reduce the costs and are a quite safer method of hitting the targets. They have, no doubt, made the war too easy. But it does not mean that drones are the cause of increasing the possibility of conflicts. The fact is that the very nature of warfare is changing with changing international system. Distances are reduced, and the effect of globalization on military affairs is being seen in the form of the drone revolution. 21st century is being regarded as an age of asymmetric warfare and drones are being considered as an asymmetric solution to the asymmetric problem of today's unconventional warfare. Responding to this notion, 68% of the respondents regard unmanned warfare to be a kind of an asymmetric solution to an asymmetric problem; finding and fixing foes mingled in the civilian population while 32% of the respondents disagree with the notion.

[9] Thomas Hopson, "The Drone Revolution," *The Politic* (February 2013), http://thepolitic.org/the-drone-revolution/.

The invention of unmanned aerial vehicles was a technological breakthrough, which led to major doctrinal changes. Drones are being considered as an asymmetric solution to the asymmetric problem; the present day's unconventional warfare. They have brought a transition in the entire conduct of military operations, as now military operations are being conducted by the human operators sitting thousands of miles away from the site and operating the drones from their keyboards. There was always a dream of eliminating the fog of war, after its identification by Clausewitz. Eliminating unpredictability, increasing precision, reducing casualties, and the political and economic costs of war have always been the primary objectives of the military strategists. In order to achieve these goals, the concept of RMA is one of the widely discussed topics amongst military strategists and policy makers, as it characterizes the incorporation of new technologies in order to enhance military capabilities. Drones are capable to acquire information, reducing unpredictability, and are highly precise and cost effective, thus justifying the claim of being considered as a revolution in military affairs. They have distinctive features of stealth, long range precision strike capability, and involve innovations in information and communication technology (ICT) like advanced sensor equipments and internet based information warfare. This ICT innovation combined with complex precision weaponry thus presents an RMA which is intended to minimize casualties. Moreover, this RMA is focused on achieving a decisive victory over an enemy force with as few resources as possible.

Table No 5: The Issue of Autonomy

S. No.	Options		Number of Responses	Percent	Valid Percent
1	Valid	Limited Autonomy	65	53.3	53.3
2		Complete Autonomy	6	4.9	4.9
3		No Autonomy	50	41.0	41.0
4		No Response	1	0.8	0.8
		Total	122	100.0	100.0

Giving autonomy to drones is one of the major debates these days. But the question is, even if autonomy is given, then what should

be its limit? Whether it should be a total, limited, or autonomy at all? 53.3% of the respondents are of the opinion that there should be a limited autonomy, 4.9% are in the favor of complete autonomy while 41% are in the favor of any autonomy. Thus, majority of the respondents are in favor of limited autonomy.

The level of autonomy required is directly proportional to the complexity of the situation. Simple surveillance and reconnaissance missions do not require much autonomy, but special combat missions need more autonomy in order to cope with the situation – the aircraft has to work in a hostile territory and has to face the enemy's security systems.

The development of autonomous capability is required to develop on board situational awareness and to take decisions about the implementation of next mission, especially during long surveillance missions, in order to reduce the operator's workload and data link bandwidth requirements. It also helps in taking a timely decision to react accordingly in case of any unplanned event. Moreover, there are certain tasks which can only be managed by giving autonomy to the aircrafts. For example, in any mission, the control of several aircrafts working in collaboration can be managed only by giving these aircrafts the autonomy to respond to each other in accordance to requirements of the situation.[10]

Even, in case of autonomous air vehicles, there is always a need to maintain communication link with the ground control station and keep the operators well informed in order that may react accordingly in case of any expected incident. There is a need to pursue a proper balance between the costs and benefits of giving autonomy to the air vehicles. Moreover, there is also a need to develop such a system in which the operators have a control at certain level in order to overcome any technological pitfalls or to keep control in crises situation. Drones should be given limited autonomy instead of making them totally autonomous in order to prevent them from becoming Frankenstein's Monster. Automation in drones should not cross a threshold where the operators may make machines for an

[10] Marco Protti, "UAV Autonomy – Which level is desirable? – Which level is acceptable?"*Alenia Aeronautica Viewpoint* (2007).

ill-action. It could be made possible by creating special sensors and interfaces to keep the operators well aware of the combat situation to ensure their firm grip on the situation.

Table No 6: Restriction of Drones to Surveillance

S. No	Options		No. of Responses	Percent	Valid Percent
1	Valid	Agree	79	64.8	64.8
2		Disagree	41	33.6	33.6
3		Other	2	1.6	1.6
		Total	122	100.0	100.0

There is an opinion that drones should be limited to the surveillance and reconnaissance missions. When asked whether drones be restricted to surveillance purpose and that armed drones to be prohibited, 64.8% of the respondents agreed with their usage only for surveillance purposes, while 35.2% of them were of the view that there should be no such restriction on their usage.

Table No 7: Role of UAVs in Weakening the Terrorist Networks

S. No	Options		No. of Responses	Percent	Valid Percent
1	Valid	No	78	63.9	63.9
2		Yes	44	36.1	36.1
		Total	122	100.0	100.0

While answering about the UAVs' capability to reduce the efficiency of terrorist networks by disrupting their communication systems, 36.1% of the respondents views that drones have undercut the terrorist ability to communicate and to train new recruits while 63.9% of the population disagrees with the notion. These results indicate that although drones are successful to keep a check on terrorists, but here again, the use of drones for surveillance and reconnaissance has proved to be worthwhile, but their use for signature strikes has again proved to be counterproductive.

Hassan Abbas in his article "How drones create more terrorists?" discusses the same issue. The feeling of revenge emerges in people who are deprived of their kith and kin due to these drone strikes. They consider drones as an ultimate evil. Here the point to consider is that the essence of counter terrorism operations is in winning the confidence of common people as only they can help in capturing terrorists. But in this case, the terrorists gain the public sympathies, which help them to mingle with the citizens, thus making

the counterinsurgency operations more risky and complicated. This situation provides a food for thought to the military strategists and highlights the significance of raising public awareness about the usage and efficacy of drones.[11]

Table No 8: Drones and Violation of National Sovereignty

S. No.	Options		No. of Responses	Percent	Valid Percent
1	Valid	Agree	83	68.0	68.0
2		Disagree	33	27.0	27.0
3		Other	6	4.9	4.9
		Total	122	100.0	100.0

One of the most controversial issues regarding the use of drones by military is violation of national sovereignty of that particular state on which drone strikes are being conducted. But there is also violation of sovereignty in case of air raids or other forms of intervention. On one hand, 68% of the respondents agree with the notion that although a drone strike may violate the local state's sovereignty, it does so to a lesser degree than by putting a foreign state's boots on the ground or conducting a large scale air campaign. On the other hand, 27% of the respondents disagree with it.

Table No 9: Risk Factor in the Available Alternatives

S. No	Options		No. of Responses	Percent	Valid Percent
1	Valid	Agree	81	66.4	66.4
2		Disagree	41	33.6	33.6
		Total	122	100.0	100.0

One of the distinguishing features of drones, which provide them an edge over other means of warfare, is that they reduce the risk factor and vulnerability of the pilot. All other available alternatives are too risky as compared to drones. 66.4% of the population agrees with the notion which illustrates that the majority of the people are of the view that drones are comparatively less risky, and. therefore, more efficient means of warfare today.

Table No10: Drones as the Most Appropriate Weapon of Choice in Network Centric Warfare

[11]Hassan Abbas, "How Drones Create More Terrorists," *The Atlantic* (August, 2013), http://www.theatlantic.com/international/archive/2013/08/how-drones-create-more-terrorists/278743.

S. No.	Options		No. of Responses	Percent	Valid Percent
1	Valid	No	38	31.1	31.1
2		Yes	84	68.9	68.9
		Total	122	100.0	100.0

The modern warfare is based on the system of network centric warfare. Network centric warfare needs a well-organized communication system for information sharing and collaboration during operations. This kind of network can only be developed by drones. They can work in a network by mutual collaboration in order to locate and hit the suspected targets with precision and accuracy. Network centric warfare is a major feature of counterinsurgency operations and the operations conducted against the terrorist mingled in the civilian population. So, for this purpose, drones are being regarded as the most appropriate weapon of choice.

After Analyzing the results obtained from the survey, it can be inferred that UAVs have become the ultimate weapons of choice for the military strategists in the modern warfare because they are especially designed to fulfill the needs of network centric warfare, which is otherwise not possible to conduct with such precision and persistence due to physical limitations of human beings.

Strategic Implications of Drone Warfare: Transformation of Conflict, Law, and Policy

The strategy of unmanned warfare with the employment of drones, the unmanned aerial vehicles, is the strategy of 21st century, and the future of modern warfare seems dependent on the success of this strategy as it has transformed the nature of conflict from manned to unmanned. With transformation in nature of conflict, the laws regulating the conflicts and the policies designed in order to manage the conflicts, also need to be transformed. The strategy of drone warfare seems to be successful at killing the suspected terrorists, but the question arises that whether this killing contributes to a reduction in the threat imposed by these terrorist groups or it is merely a short term solution with far reaching repercussions?

There is a school of thought which considers drones to be only a tactical success, not a strategic one. The proponents of this school of thought are of the view that the drones merely hit the

desired targets, who are then replaced by new recruitments in the terrorist networks, mostly from the families of the victims of collateral damages. Thus, the cycle continues without any significant success for either belligerent, ultimately resulting in endless sufferings and destruction of the life and property.

Implications of drone attacks on the foreign policy and international relations are also of considerable significance. Most of the times, this strategy sparks a public backlash, and the terrorists even get the public sympathies which make them even more stronger and well-entrenched in the society. Moreover, this strategy adversely affects the bilateral relations of the two states; the one who is employing the killer drones as a part of its strategy, and the other whose sovereignty and territorial integrity are being violated. Human rights violations are another issue which is raised by the international community. Violation of International law is one of those areas which need immediate attention, and there is a dire need for development of international law regarding drone warfare which deals with the question of drone warfare being a just war or not.

Drones involve targeted killing, and in most of the cases, extra-territorial killings. This raises the question of violation of national sovereignty and territorial integrity of the states under attack. Similarly, no compensations are paid to the victims of collateral damages as there is no authentic public record available regarding the number of these collateral damages. Likewise, drones are relatively cheaper than the manned aircrafts and the invulnerability of the operator makes the equation more unbalanced, thus putting a question mark on the justification of war. The kind of distant and automated killing which the drones are offering has made warfare quite easier to conduct. Moreover, the development of totally autonomous drones is detrimental to the development of human rights; thus, there is a dire need of putting some restrictions on the autonomy of drones. Another reason for the worldwide public condemnation of drones is that there is no authentic data available regarding the victims of drone attacks. Different figures are available from different sources, and there is a wide gap between these figures which make them less reliable and raise public voice regarding the collateral damages.

Socio-political implications of drone warfare include the increasing alienation between the targeted population and the states

responsible for drone attacks, the decreasing role and strength of United Nations Security Council in peaceful conflict resolution, economic and psychological implications of drone attacks, and the increased vulnerability of the states who do not possess this technology, thus creating another kind of haves and have-nots; those who possess drones and those who do not. It is a kind of technological divide which is going to develop two kinds of states; those who are technologically developed and are capable of attack, and the others who do not possess this technology and are vulnerable to attack.

Scope of the Strategy of Unmanned Warfare

Unmanned Warfare is the strategy of today's globalized world, and is the most efficient means of conducting network centric warfare which has become the nature of warfare in the 21st century due to increasing asymmetry and unconventional means being used by the warring groups. The modern war is waged without any consideration of national boundaries, as it is based on the networks of the warring groups and the trans-boundary alliances, in which they have entered. Under such conditions, the deployment of drones gives the desired outcomes as they are capable of operating in networks. In order to increase the efficacy of drone warfare, there is a need to generate awareness among the public regarding the need of drones and the advantages which they offer. Drones are being considered as an asymmetric means for the asymmetric warfare of today, and asymmetric warfare is not only among the armies of the warring states, rather it needs everyone to be involved; either directly or indirectly. So the public has to be taken into confidence for the success of drone operations.

Conclusion

In the contemporary era, unmanned aerial vehicles are replacing the manned aircrafts and have proved to be more efficient and persistent as compared to the latter. This paradigm shift is being considered as a revolution in military affairs as it has transformed the nature of warfare according to the changing demands of the time. The asymmetric nature of 21st century warfare needs an asymmetric

solution; there are no defined battlefields with man to man combat, rather the insurgents mingled in civilian population are to be found and targeted, which has made the whole world a battlefield; thus, increasing the demand of a network-centric warfare. Drones with their primary functions of intelligence, surveillance, and reconnaissance are the ultimate weapon of choice for this unconventional warfare without risking soldiers' lives and with their ability to withstand dull, dirty, and dangerous environments with persistency.

Although, drones are being considered to be the signature weapon in the 21st century, but like every other technology, they also have many shortcomings. But these shortcomings (i.e., collateral damages and psychological effects) are mostly associated with hitting the targets, and not with the surveillance and reconnaissance missions. So drones can be successfully deployed as a strategy for surveillance missions, and to locate and trace out the desired targets. As far as killing by drones is concerned, it still needs more sophistication in their programming in order to avoid the collateral damages. There is also an option that drones should be used only to trace the targets, and then they to be arrested and tried in courts according to the legal procedures; thus, avoiding the criticism of extra-judicial and extra-territorial killings. But this could only be possible with collaboration of the army and intelligence of that particular country in which the operation is being conducted. In that case, there will be no violation of national sovereignty, and the feeling of vulnerability and fear in the civilian population will no longer be there, as their own army will be engaged in the operations which will give them a feeling of security instead of generating fear and hatred. It would lead to more successful operations by acquiring support of the civilian population, which is the primary requisite of any counterinsurgency operation.. The future of modern warfare lies within the strategy of unmanned warfare, as the use of drones is becoming paramount in military operations. They are becoming more and more sophisticated, and their precision is being increased day by day. Although they are facing challenges until now, but this is the thing faced by every new innovation. They just need to be deployed after thorough consideration because even though they do not require much physical involvement, but they do need full mental alertness of

the operators. Drones are a reality; they have been made and are being deployed, so they cannot be unmade now, just like nuclear bomb or any other technology. It is a fact that even after many treaties, there is no disarmament or even arms control in real terms. So, drones are there, they will be there, but the thing is that there should be some rules and regulations for their deployment in order to avoid human rights violations and to ensure international peace and stability.

But considering drones to be a silver bullet or panacea to control insurgencies and to gain control of the situation is not a pragmatic approach. They can lead to disastrous consequences if not handled properly because like every right, responsibility increases with every new technological innovation as well.