

Drones as Futuristic Crime Prevention Strategy: Situational Review during COVID-19 Lockdown

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ABSTRACT The current global pandemic has raised a question in setting the priority of national security over privacy. The situation of Lockdown has imposed travel restrictions in significant countries. Every citizen is requested to adhere to social distancing and to adhere to the law and order situation. It is challenging for law enforcement agencies to uphold the orders of quarantine for people without being a carrier of transmission. The objective of the paper is to explore the efficacy of utilisation of Drones for crime prevention. The paper works upon a systematic review of multiple regional and national articles of different countries. The content of these articles were analyzed to reflect the best practices utilized in these countries that can document the changed outlook of crime prevention soon. This paper suggests drones as futuristic machinery complementing the existing workforce in law and order scenario.

INTRODUCTION

Crime prevention is the various measures and strategies that lead to reduce the risk of crime and its distinct outcome on individuals and the environment, including the fear of crime and by monitoring various causes of crime (Shaw 2010). Brantingham and Brantingham (1991) have specified four measures of crime commission that is the law of the land, the guilty party, the injured party, and the scene of a crime. Crime Prevention through Environmental Design (CPTED) under Environmental criminology reflects six major crime prevention strategies, namely Jurisdictional parameters, Observation, Maintenance, Admit criteria, Transit monitoring, and Target specific measures (Moffat 1983). Considering the setting of observation under Moffat (1983), surveillance divides into formal and informal supervision. Proper supervision is enforced by law enforcement authorities, in lines with their duties associated with patrolling, offender tracking, and crime prevention. These formal surveillances are located as security guards outside various establishments, police officials patrolling at night, and many others. Automated surveillance is measures utilized through the assistance of mechanical and electronic equipment. The automated surveillance located as closed-circuit television (CCTV), positions at various hot spots or vulnerable spots of crime. Automated monitoring with lighting

works better over the challenges faced by earlier CCTV's and other mechanical surveillance equipment. The outcome of these challenges resulted in a night vision camera and additional light-sensitive CCTV's or automated surveillance equipment.

Over the above approaches of surveillance, a surveillance strategy identified in collaborating the formal, mechanical, and lighting observation would be a near to perfect crime prevention strategy. The unarmed airborne machines with observation competences – 'Drone cameras' – are utilized by the United Nations Security Council Resolution (UNSCR). These cameras are placed globally in no time to observe and witness various events and activities on the ground. Such cameras entail human right perspective with a worrisome objective of privacy of individuals in the society. If these practices are developed and enforced in a more humane approach, then these would benefit the community at large with curtailing the volume of crime (Phillips 1999). Unmanned Aerial Vehicles (UAVs) present extraordinary difficulties because of their capacity to utilize an assortment of sensors assembling data from special focuses, significant stretches, and on a nonstop premise. The possibility of everything monitored, and conceivably recorded, raises vital universal freedom and security concerns. Simultaneously, there are numerous attractive advantages related to these advances.

Unmanned Aerial Vehicles (UAVs) are alluded to robot planes, pilotless airplanes, Remotely Piloted Vehicles (RPVs), Remotely Piloted Aircraft (RPAs), and different terms which portray airplane that flies heavily influenced by an administrator with no individual on board. Most UAVs outfitted with camera advances that record and transmit photograph pictures to the ground control station. These advancements have become less expensive and increasingly refined and permit picture catch at more noteworthy details with more prominent goals (Cavoukian 2012). It is additionally conceivable to furnish UAVs with sensors, for example, forward-looking infrared (or other warm imaging) cameras, that can distinguish infrared radiation, regularly transmitted from a warm source, and make the “image” collected for the video yield. Propelled video investigation can apply human-made brainpower to gathering and handling extensive measures of video information. This equipment, when combined with facial recognition (FR) programming, can be utilized to follow people while in broad daylight consistently and in private (for example, through windows or even dividers) (Gertler 2012). Bento (2008) showed three fundamental UAV innovations: smaller UAVs, Tactical UAVs, and Strategic UAVs:

Miniaturized Scale UAVs

Miniaturized scale and shorter than usual UAVs are the littlest UAV innovation. These devices fly at low heights (underneath 300 meters). These UAVs work in “urban ravines” or inside structures, flying along with lobbies, conveying tuning in and recording gadgets, transmitters, or small-scale TV cameras. Miniaturized scale UAVs are tinier than small scale UAVs, weighing as less as 100 grams; lower than usual UAVs weigh under 30 kilograms and fly at elevations somewhere in the range of 150 and 300 meters. Miniaturized scale and smaller UAVs are, for the most part, utilized in conventional/business applications.

Tactical UAVs

These UAVs are heavier UAVs (from 150 to 1,500 kilograms) that fly at higher elevations (from 3,000 to 8,000 meters) and fundamentally

utilize to help military applications. These UAVs have six subcategories: Close range, short-range, medium-range, long-range, continuance, and Medium Altitude Long Endurance (MALE) UAVs. Long-range UAVs utilize further developed innovation: regularly, this implies a satellite connection (or another stage), which goes about as a hand-off to defeat the correspondence issue between the ground station and UAV – a problem brought about by the world’s shape.

Strategic UAVs

At higher heights, UAVs will, in general, be more massive stages with longer flight reaches and continuance. The High-Altitude Long Endurance (HALE) UAVs are the heaviest UAVs, having Maximum Take-off Weight of as much as 12,000 kilograms and a most extreme flight elevation of around 20,000 meters. These enormous stages can convey bigger and heavier payloads and increasingly refined gear.

Many countries have imposed restrictions on the utilization of drone or crewless air vehicles for commercial purposes and have confined towards military and defense functionary. The United Kingdom, in 2010 and India in 2014, imposed a ban on the use of drones in public spaces citing privacy and security concerns. The new policy notified by Director General of Civil Aviation (DGCA), India states requisite permission and security measure before every flight. It also curtailed the utilization of drones for any hazardous or illegal usage. The new policy also except the category of micros and nano drone, which leaves the professionals in iffy over their practice and contribution in various security breaches (Yadav 2019). Since the city is growing vertically by rapid urbanization and in situations, where territory surveillance is critical, drones reflect as a perfect solution for crime prevention. The current scenario of Lockdown, wherein the restriction of movement and transit are crucial through various surveillance strategies. It is imperative to employ surveillance equipment that covers a large area with a reduction in cost, time, and energy. Drones are perfect eye in the sky for the police officer without the necessity of the workforce on the ground.

Objective

The paper aims to evaluate the utility of Unmanned Air Surveillance that is Drones as an effective crime prevention strategy. The paper analyses the functionality and productive nature of drones given tough times, especially Lockdown under COVID-19 situation and various other circumstances in the future over the number of an available environmental crime prevention approach.

The paper also reflects various case studies of the utilization of air surveillance in different countries across globe. The case studies resonate with the utility of drone in varied forms starting from pro-active crime prevention measures to identification of criminals to prevent further commission of the crime.

METHODOLOGY

Using the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) checklist (Moher 2009), the author drafted a plan for the case study analysis. Those articles written in English, published since December 2019, and included strategies globally were eligible for inclusion. The independent variable included surveillance through a drone or Unarmed air vehicles with the dependent variables to be crime prevention. There were no biases based on gender, age, country, political ideology, and other administrative constraints. The emphasis of the cases was on documented news articles, interviews on various portals, and notifications by multiple state and central administration. The literature review of the paper includes studies, experiments, and different primary research on surveillance and crime prevention through drones.

Selection Procedure

Relevant articles, in compliance with the objective of the paper, were identified. Various search engine websites echoed in generating a database for the case study. Preliminary explorations began in January 2020 with follow up searches till April 2020. Search items enlist keywords in relevance to the study. Following words were used as keywords in various search en-

gine portal to deduce appropriate and relevant results: (Surveillance OR drone OR unarmed air vehicle OR drone camera OR pilotless camera OR "air*drone") AND ("remote camera" *OR air camera * OR eyes in the air *OR flying camera" * AND (crime * OR crime prevention OR gathering OR police OR Lockdown * OR quarrel OR infighting OR public *").

The initial search result projected 2000 articles concerning at least one of the independent variables and dependent variable in the title of the reflective content on the portal. The author screened through the relevance of the title in lines with the theme and objective of the paper. Finally, 30 articles and literature were shortlisted to analyze the utility of the study. The author utilized content analysis to assess reports from various sources comprehensively. These analyses aligned with the objective of the paper and devising the argument towards the foundation of the paper.

RESULTS

Case Study Analysis

Under the current situation, 1/3rd of the world population is under Lockdown and are confronting restriction in transit and daily schedule. Countries have invoked restrictions ranging from closing borders, to shutdown of public transport, shops, and various establishments. Countries like The United Kingdom have imposed complete Lockdown from March 23, 2020, and restricted movement outside one's houses only for essential services. Wherein Hungary also followed similar Lockdown from March 30, 2020, till indefinite period over the spread of COVID-19 alike Jordan. Singapore, Dubai, UAE, Thailand have restrictions from the last week of March 2020 towards schools, universities, transportation, and shaped situation like a curfew. Many countries like India, South Africa, New Zealand, Columbia, Argentina, Spain, Norway, Ireland, Denmark, Italy have followed federal quarantine imposing restriction and curtailing movement for non-essential services ranging from two weeks to one whole month Lockdown. Germany announced to shut down of several cities alike the precautionary measures taken by China through the most extensive Lockdown of

more than 16 cities in late January 2020. Many countries have restricted international travel, and strict preventive actions are carried out for intercity transit to reduce the transmission of COVID-19.

The period of Lockdown has emerged as a fierce battle for law enforcement professionals and various other administrative agencies in maintaining law and order. With a view of limiting the transmission of COVID-19, it's critical to restrict the movement of individuals conflicting with the rules of restraint. In these circumstances, it becomes imperative to utilize crime prevention strategies that are not only effective but also efficient. The paper reflects upon the utilization of one such measure by various officials and organizations in curbing the menace of rule violators.

China

Being the first country to be affected by the deadly virus, China was amongst the first to impose Lockdown for more than two months starting from late January. China utilized drones as a crime prevention measure across various cities in times of Lockdown. Citizens encountered drones over an uniform police official confronting them violating the lockdown measures. The drone equipped with speakers was communicating, "Yes. This is a drone speaking to you and requesting to wear a mask when outside and to stay indoors as much as possible" (Dámore 2020). China effectively utilized its robots, automated systems, and drone not just over crime prevention strategies but for other necessary measures like disinfecting public spaces during quarantine, delivering safety and essential goods to deter any panic situation amongst few (Block 2020).

India

India is one of the few countries that have imposed over three weeks of Lockdown. Being the second-most populous country in the world, crowd management amid Lockdown is a tough task. Many cities in India have utilized drones and air surveillance vehicles for mobilization, deterrence, and information dispersal amongst the crowd. Kerala was one of the first states to operate a drone for surveillance and communicated that they were determined to continue until

the Lockdown ("Police Use Drones" 2020). Telangana police have deployed drones with thermal imaging sensors and speakers in various hotspots in the city. These drones reflect the dual purpose of tracking and tracing vulnerable towards the pandemic (Pandey 2020). Similar practices within the capital of the state acted as eyes in the sky (Choudhary 2020; "Eye In The Sky" 2020). The drone has its share in the Indian police machinery as a surveillance tool. Recently, the office has responded that these drones are also utilized with facial recognition feature to track violators and criminal during violent and panic situation (Srinivasan 2020). Chennai city police have used loudspeakers on the drone to make people aware of Lockdown and the various state and central notification about the pandemic (Borbon 2020). Cities like Pune, Dehradun, Bengaluru, Guwahati, and many others have followed the air surveillance practice ("Dehradun police" 2020; "In Pune's Outskirts" 2020; "Bengaluru City Police" 2020; "Sangli Guwahati Police" 2020). The recently developed and equipped drones tend to track the temperature and trace infected individuals as far as 100 meters and within 10-15 seconds ("Drones could be" 2020). The eastern coast railway has deployed drones across various establishments and railway tracks to monitor any unlawful practice. The drone is instructed through railway police and increase the productivity of surveillance by reducing the workforce requirement ("Battling Coronavirus: ECOR" 2020). In one of its first in the country, Kerala police caught more than 40 violators flouting the lockdown rule. They were charged under various sections under the Indian penal code and set a precedent for other states to follow ("Kerala Police Nab" 2020).

France

As the Lockdown trickled in many European countries, one of the critical strategies in countering various violators on streets were through operated loudspeaker drone. French government utilized drone services of private agencies in complementing law and order situation in the city (Bourdon and Moynihan 2020).

Spain

City police in Madrid are operated by their spies in the skies and resonate that they would

not hesitate to take harsh measures to maintain law and order in the city. Madrid police responded that even during the lockdown time, “some still make it difficult for us.” The measure utilizing drone is at par with the wartime situation of surveillance regime but a needed one during Lockdown (Doffman 2020).

Israel

Many middle eastern countries, including Israel and Jordan, deployed a drone to enforce curfews and restrict the movement of citizens amid Lockdown. The official communicated that the latest technology and surveillance equipment utilizes to ensure that curfew in the city without any law and order discrepancies (AFP 2020).

Greece

The city of Athens utilized drones in capturing the strict enforcement of Lockdown, to maintain social distancing and to restrict the movement of citizens in the town (“Drone Footage Shows” n.d).

Kazakhstan

The Kazakhstan government felt that the utilization of drones is far vital as a prudent and surveillance strategy than any privacy and intrusion aspect over the pandemic. The drone provided to the government compliments the functioning of law enforcement in the capital city of Nur-Sultan (“Kazakhstan uses” 2020).

Australia

Western Australia police office regulated the law and order situation in the city through Remotely Piloted Aircraft Systems (RPAS). These RPAS announce in public spaces to oblige by the orders of Lockdown and enforce social distancing (Spires 2020a). The drones equipped with sirens, flashlights appear like a police vehicle. The drones can broadcast messages up to the range of one kilometer (Heren 2020). The officials are modifying drones that are capable

of assisting in spraying disinfectant on public spaces and streets (Spires 2020b.).

United States of America

The police department in California operated drones with cameras and loudspeakers installed for surveillance practices under Lockdown. These strategies replicate from countries like China and other European counties, where they were successful in crime prevention attempt through drones (California Cops 2020).

DISCUSSION

Crime prevention entails primary challenges in execution under the situation of Lockdown and curfew. The strategies to enhance the perils and reduction in incentives are critical parameters for effective crime prevention (Nair 2020). Thereby, it is vital to utilize strategies entailing opportunities and equipment that curtail individuals and groups committing a crime. The below-mentioned attributes reflect the utility and suitability of drones and air surveillance in the stated scenario.

Precaution and Safety

Social distancing has become of utmost importance in this pandemic. Law enforcement professionals are also vulnerable to get infected and need an additional precautionary measure to uphold the prevailing law and order. The utilization of drone and air surveillance would cater to the objective of social distancing and function as eyes for the officials. Many accidents and incidents can be supervised and prevented by drones by surveillance of areas prone to crime or hotspots of crime (McNaughton 2013).

Multi-purpose Utility

The latest drone or air surveillance vehicle are well equipped with features to compliment multi-purpose functionality. This equipment can be utilized for delivery purpose, tracing and tracking and for information dispersal. Schermer and van der Heide (2013) stated that there are three uses of drone cameras, for monitoring events,

substituting CCTV and finally for surveillance of crowded and anti social elements.

Coverage

The range of surveillance varies over the number of available drones. This equipment acts as an eye in the sky in observing vertical towers and extended spread property. Drone can be equipped with night vision to safeguard and perform surveillance in dark places for example surveillance in London airport by London police (Beake 2015).

Unmanned Surveillance

The fundamental objective of drones and motored pilotless vehicles are to function in high altitude and areas, unmapped or inaccessible through the workforce. Engberts and Gillissen (2016) stated that drones are not a continuation of human senses but it aid humans with important informations without their actual presence on the scene.

Cost-Effective

In comparison to other installed surveillance equipment, drone and air surveillance act as a cost-effective measure with no fixed installation requirement. Drones can be effective to complement the task of police peronnel with the single device (Engberts and Gillissen 2016).

CONCLUSION

Drone or Air surveillance vehicle is prevalent as a defense and surveillance machinery in many countries. These drones were rarely utilized in civil functioning and curtailed citizens over its private use. We have reached in a global scenario, where states would get affected on health, social, and financial ground from issues originating within or outside the country. It is high time that countries review the use of drone and such air surveillance vehicles in day to day scenario. These equipment can act as added eyes and hands to the existing workforce and also as a better technological advantage. The only hurdle is involving these air surveillance machinery in the daily schedule is over the hu-

man rights perspective. The question of intrusion and privacy has risen in the past in the utilization of such equipment. The answer lies with government officials and administrators over exploring the option of a drone in a critical situation or keeping privacy in mind and trading national security and public health.

RECOMMENDATIONS

The global scenario is coming years would make every country rethink on the utilization of technology to their best and keeping safety and security first nationally. Thereby, a drone is the future recruits in law and order division, and each country would take notice of it sooner or later. Drones can serve as a multi-utility equipment to police force and also emergency services. Every government should formulate policy to pilot test the role of drone in various services that can control crime, detect mishapening and compliment first hand responder in their services. The effectiveness of drone or unarmed vehicle for surveillance can cover the shortage of manpower and aid in various functionality.

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