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No. 586-Estt/ITE-20012/2/2020 Date: 28/12/2020

Subject: **West Bengal Drone Technology Promotion Guidelines, 2020**

Ref: This Office Notification vide No 584-Estt/ITE-20012/2/2020 dated 28.12.2020.

The State Government in the Department of Information Technology & Electronics has issued Notification under reference to formulate 'West Bengal State Broadband Policy 2020' wherein the instant ORDER features as Annexure B.

ORDER

The Governor is pleased hereby to make the following guidelines in order to bring clarity, simplification and standardization in theprocess of establishment of drone technology ecosystem and further utilisation of this technology and appropriateimplementation within the State of West Bengal. The State is poised to leverage drone technology to empower its citizens into anew era of transformation by framing new guidelines to facilitate the ecosystem for this novel technology to flourish. Drones areadvancing to the consumer-market and presently being utilized in commercial and civil government applications that traverseacross sectors and industries. With the Director-General of Civil Aviation (DGCA) publishing the regulations, India has theopportunity to become a global leader in the drone technology, and West Bengal is planning to tap this opportunity by bringingin a set of guidelines that empowers the drone industry to develop and enhance service delivery to the citizens exhibiting the its use forsocietal advantage.Through these guidelines, The Government of West Bengal (GoWB) would be able to leverage drone technologyfor real-time governance in order to enable effective and efficient service delivery to the citizens.

1. Short title, extent and commencement

a) This set ofguidelinesmay be called the **"West Bengal Drone Technology Promotion Guidelines, 2020"**
b) It shall extend to the whole of the State of West Bengal
c) It shall come into force with effect from the date of issue.

2. Definitions and Interpretations

In the foregoing provisions, unless the context otherwise requires -

1) **Autonomous Aircraft** means an unmanned aircraft that does not require pilot intervention in the management of the flight;
2) **Controlled Airspace** means airspace of defined dimensions within which air traffic control service is provided in accordance with the airspace classification;
3) **Danger Area** means an airspace of defined dimensions within which activities dangerous to the flight of unmanned aircraft system exist at specified times;
4) **DIT&E, GoWB** means Department of Information Technology & Electronics, Government of West Bengal
5) **Drone Corridor** means a segregated path or airspace defined by the competent authorities for operation of UAS;
6) **Director-General"** means Director-General of Civil Aviation (DGCA), Government of India;
7) **Drone port** means a defined area on land or water (including any buildings, installations, and equipment) intended to be used either wholly or in part for the arrival, departure, surface movement and associated maintenance or commercial activities of Unmanned Aircraft;

8) **GoI** means Government of India;
9) **GoWB** means Government of West Bengal;
10) **Maintenance** means the performance of tasks required to ensure the continuing airworthiness of an unmanned aircraft system, including any one or combination of overhaul, inspection, replacement, defect rectification or repair or test;
11) **Manufacturer** means a person who manufactures or assembles UAS or any part or component thereof;
12) **Model Remotely Piloted Aircraft System** means a Remotely Piloted Aircraft without payload used for educational or experimental purposes only and flown within visual line of sight of the person operating the Remotely Piloted Aircraft System;
13) **Owner** means a person who owns or takes on lease an unmanned aircraft system;
14) **"Operator"** means a person, organisation or enterprise engaged in or offering to engage in unmanned aircraft operation;
15) **Payload** means any component or equipment or any other material on board the unmanned aircraft that is not required for the flight or its control;
16) **Remotely Piloted Aircraft** Observer means a trained and competent person designated by the operator who, by visual observation of the remotely piloted aircraft, assists the remote pilot in the safe conduct of the flight;
17) **Subject Matter Expert (SME)** means a person having a deep understanding of Drone technology and allied domains
18) **Unmanned Aircraft System (UAS) / Unmanned Aerial Vehicle (UAV)**means an unmanned aircraft and its associated elements, which are operated with no pilot on board;
19) **Unique Identification Number** means the unique identification number issued for registering unmanned aircraft by the state of registry;
20) **Visual Line-of-Sight Operation** means an operation in which the remote pilot or the observer maintains direct unaided visual contact with the Remotely Piloted Aircraft;
21) **WBDCoE** means West Bengal Drone Centre of Excellence

3. Foreword

As industries across relevant sectors embark upon the journey of adoption of drone technology, Governments would have a significant role to play. Government is perceived as a facilitator for providing a conducive environment to the industry players through much-needed interventions on regulatory reforms, capacity building, skill enhancement, standardization, infrastructure, and security measures. An Industry-Government collaboration is crucial to ensure that a supportive environment is created for the technology to mature.

The Ministry of Civil Aviation, Government of India, had published the draft Drone Policy 2.0 on 15th January 2019. This draft policy is a suggestive one, and the final policy is planned to be formulated by a task force headed by the Civil Aviation Secretary and also the Director-General of Civil Aviation (DGCA). Until then, the existing Drone Policy (Drone Policy 1.0 or Civil Aviation Requirements dated 27.08.2018) stands.

The draft policy prepared by the DGCA outlines the regulations for carrying out drone technology operations across the country. In this regard, the State would abide by all the institutional, supervisory, regulatory and other guidelines and frameworks advised by DGCA. Keeping such regulations in mind, the Government of West Bengal has prepared a set of guidelines for building an ecosystem that promotes and encourages the usage of drones for the larger public interest.

4. Preamble

Technology offers evolving challenges and creates new solutions. Drone technology is regarded as a technology with the potential to influence almost all industries and economies. The use cases of drone technology are spread across industries and sectors and ranging from healthcare, construction, tourism, agriculture, police, insurance, journalism, and many more. Countries like the United States, the United Kingdom, and the European Union have created conducive environments for organizations to benefit from drone applications and associated technologies. Consequently, these markets have seen a lot of capital funded in drone tech. and are driving innovation in this market.

India is also building an environment for different players in this ecosystem of firms and start-ups to collaborate and generate value for each other. With the drone space expanding within the country, it is crucial that Central and State Governments explore the use of Drones for effective and efficient governance. India is expected to be one of the fastest-growing markets for UAVs and drones

because of this technology's ability to transform all key sectors. According to the global market intelligence and advisory firm, BIS Research, India's UAV market is expected to reach USD 885.7 million by 2021.[1] This uptake is inspiring governments to frame policies and regulations on the use of drones. India has already commenced the experiments of drones in numerous domains. Mostly six segments, namely Infrastructure, Agriculture, Mining, Energy & Utilities, Media & Entertainment, and Insurance, have been experiencing notable traction in India as various state Govt. and Govt. regulatory bodies are exploring the use cases of the Drones. Keeping these new developments in mind, the Ministry of Civil Aviation published the draft Drone Policy 2.0 on 15th January 2019, containing recommendations across the drone value chain.

The Government of West Bengal (GoWB) has been leveraging emerging technologies for real-time governance to enable effective and efficient service delivery to the citizens. West Bengal is poised to leverage new technologies to empower its citizens into a new era of transformation by framing new policies to facilitate the ecosystems for these novel technologies to flourish. While technologies such as blockchain, Internet of Things (IoT), Artificial Intelligence, and cloud computing are being adopted by the State, the government is in the process of recognizing the potential of Unmanned Aircraft Vehicles (UAVs), also commonly referred to as drones. Drones are evolving past their military origin and advancing to the consumer-market and presently being utilized in commercial and civil government applications that traverse across sectors and industries. With the Director-General of Civil Aviation (DGCA) publishing the regulations, India has the opportunity to become a global leader in the drone technology, and West Bengal is planning to tap this opportunity by bringing in a set of guidelines that empowers the drone industry to develop and enhance service delivery to the citizens exhibiting the use of technology for societal advantage.

5. State's vision

Aligned to its vision of becoming a leading state in the application of emerging technologies, the Government of West Bengal has introduced numerous initiatives to cultivate a conducive ecosystem for novel technologies in the State. The State Government recognizes the drone industry's potential and realizes that the government will have to play the function of a catalyst in strengthening the ecosystem that will enable the drone companies to flourish in the State. GoWB has piloted several initiatives on drone technology for real-time service delivery, surveillance, monitoring, and evaluation purposes. Drones are also being used for surveillance during the lockdown of COVID-19. The intent of the govt. is to use the technology as a tool to complement manual inspection. Worldwide, drones have demonstrated their efficiency, particularly in the inaccessible and unfamiliar terrain. The drones are also being used to spray insecticides, collect samples, to combat dengue, etc. The monitoring cell of the GoWB has also used drones to deliver medical supplies to remote areas. Drones are being used for surveillance purposes for various public gatherings and festivals. Further, GoWB is using drones for disaster management and relief operations.

GoWB is promoting drone technologies to implement drone powered solutions into various government departments to enable efficient and productive governance. The govt. is also creating awareness on drone technologies to empower the drone operators and to develop an ecosystem for R&D, Manufacturing, Start-ups, and Innovation in the State. Further, the State envisages to offers various drone-based services, such as,

- Aerial Surveying and Mapping
- Aerial Surveillance, Security and Monitoring
- Aerial Inspections
- Agricultural Services
- Disaster Management and Emergency Services
- Inventory Tracking

Overall, the State foresees to construct:

A thriving drone ecosystem to propel the economic growth in West Bengal.

A drone ecosystem built on the sound and secure foundations of an encouraging policy, robust infrastructure, human capital, research & development, and market access would and encourage and enable the use of drones, which in turn would lead to the creation of employment possibilities and economic prosperity in the State.

[1]https://www.pwc.in/assets/pdfs/publications/2018/flying-high.pdf

6. Key Verticals

This guideline aims to create a balance between regulations and drone usage, which ultimately is envisaged to increase economic activity due to the use of drones. The set of guidelines endeavours to achieve this goal by presenting an environment that promotes and encourages the usage of drones for the larger public good and presenting necessary resources for developing the talent pool to address the numerous roles emerging out of drone usage, from assembling of the drones to processing of the data acquired. The formulation of a drone friendly guidelines and environment, supported by a pool of technical resources, will support the establishment of drone manufacturing companies in the State. This set of guidelines is the primary step towards that endeavour and is based around four key verticals:

I. Key Vertical – I: Capacity Building

The availability of a pool of high-quality talent pool is a sine qua non for the growth of the drone industry. While West Bengal has many engineering colleges and a large number of Training Institutions specialized in IT and computer sciences, it is necessary to create an environment that promotes the quality of education in drone technology in alignment with the specific requirements of the industry. To this end, the Universities will be encouraged to introduce drone technology course curricula following the industry requirements.

II. Key Vertical – II: Supporting Infrastructure

The government shall strive to establish state-of-the-art drone technology infrastructure of global standards suited to the industry requirements. The facilities, in the form of West Bengal Drone Centre of Excellence, drone testing facility, Infrastructure for product design, drone manufacturing and assembling, cloud Infrastructure for storing and analysis of captured Data, rapid prototyping infrastructure, shall be developed adopting a transparentguidelines. A multi-departmental mechanism would be established to improve the drone infrastructure across different districts.

III. Key Vertical – III: Promoting Research and Innovation

The State Government through West Bengal Drone Centre of Excellence (WBDCoE) would provide a platform for Industry and Academic Institutions to come together and provide students hands-on industry experiences through internships on the real-life implementation and problem solving on the technology. Universities and Technical Institutions of West Bengal will be promoted and encouraged to forge partnerships with the technology companies to carry out research in this technology and formulate solutions and skills supporting the future initiatives of both the private and public sectors.

IV. Key Vertical – IV: Government Facilitations

The Government of West Bengal would provide state-of-the-art data infrastructure facilities, access to anonymized Public transactional data, support in identification of right talent and upskilling them through Technical Institutions, and universities for the Enterprises, SMEs and start-up companies that invest efforts in innovation and research in drone technologies.

Key Vertical – I: Capacity Building

The Government of West Bengal understands that since the drone industry in India is ready to take off, there will be a considerable talent demand in the immediate future. The talent pool is required to be developed through intensive training programmes, developing an educational curriculum, and investing in research. The government plans to:

a. Introduce drone training modules

Introduce drone training modules in Technical Training Institutes to focus on skill sets needed to make graduate students industry-ready. The modules will be formulated in collaboration with the industry and as per the DGCA guidelines. It would include Trouble Shooting, Simulator based Training and final Real Time Drone Training on Fixed Wing and Multirotor Drones. It will cover pre-flight, in-flight, and post-flight modules. Also, impart drone-based courses and training to school students. Introduce drone technology modules and give first-hand experience to the school students and support such initiatives with

teacher training sessions.

b. Skill-building for implementation of drone as a service (DaaS)

Capacity needs to be built regarding Drone as a Service (DaaS), which provides an end-to-end solution, from flying the drone to using machine learning platforms to analyse drone-captured data. This service ensures that both private and public sector organizations can use drones according to different use cases being selected.

c. Development of domain-led programmes

Encourage the development of domain-led programmes for specific requirements like surveillance, aerial photography, remote sensing, etc. These domain-led programmes will help in the formulation of a freelancing ecosystem. The government will provide incentives to the drone academies to create these specific modules such as Image Processing Specialists, GIS Engineering and other Industry specific roles.

d. Drone engineering research in leading technical universities

The West Bengal Drone Centre of Excellence would provide a platform for Academic Institutions and industry to come together and offer students hands-on industry experience through internships on the real-life implementation and problem solving around the technology. Universities and Technical Institutions of West Bengal will be promoted and encouraged to forge partnerships with the technology firms to undertake research in this domain and develop solutions and skills for supporting the future initiatives of the private and public sector.

e. Collaborate with Global Tech Institutes

Collaborate with premier technological universities to create specialized courses on drone tech so that the drone manufacturers can recruit drone design engineers directly from colleges.

* All Capacity building endeavours mentioned in this section would be carried out under the aegis of DIT&E, GoWB

Key Vertical – II: Supporting Infrastructure

Drone technology, like other emerging technologies, is progressing through phases of exploration, early adoption, pilot tests, and finally, implementation to reap the intended value. The aggregation of interested stakeholders for a distributed usage of required infrastructure for development, testing, and initial implementation of drone-related solutions is one way of optimizing the cost while paving the way for continuous research and development. The Government of West Bengal will support the use of shared infrastructure, both physical and technology-related, to support research, prototyping, and development of drone solutions in the State. The State will strive towards creating shared infrastructure facilities which can be utilized by industry, start-ups, communities, and academia, either free of charge or at a nominal cost. The State Government would take up specific steps in this direction, as detailed below:

a. Building the West Bengal Drone Centre of Excellence (WBDCoE)

The drone manufacturers and service providers need significant infrastructure support to develop and test their products/solutions if they want to transform from the current nascent State into a mature industry in the future. The State Government will establish a West Bengal Drone Centre of Excellence (WBDCoE), which is envisaged to become India's pioneering Unmanned Aerial Vehicles (UAVs) test and business centre. This WBDCoE would foster a vibrant drone ecosystem and will facilitate the sharing of best practices, resources, and promote innovation. The CoE would also collaborate with other state-of-the-art technology CoEs(e.g.Cyber Security Centre of Excellence) of the State in this regard.

Infrastructure support plays a significant role in the growth of any industry. The development of the WBDCoE will lay down the foundation for a strong drone industry.

The key focus areas would be:

i. Identify focus sectors based on future potential demand estimations:

ii. Classify use cases or services relevant to different state departments

iii. Strategy and framework for monitoring project execution

iv. Partnership with Industry bodies, Drone tech. organisations

While there is a wide range of potential applications, the focus areas for the government are primarily energy, agriculture, municipal administration, irrigation, and public safety. The government shall build a Drone Management Office in the WBDCoE that will help different government departments in procuring services from drone service providers in the following ways:

- Collaborate with empanelled drone agencies to undertake research in specific domains
- Identify use cases or services relevant to the departments.
- Enter into framework agreements with vendors
- Undertake capacity building programmes

b. Infrastructure for product design, drone manufacturing, and assembling

Unmanned Aerial Vehicle (UAV) manufacturers depend heavily on proper manufacturing facilities, design processes, and assembling equipment. As the UAVs produced become more sophisticated, ad-hoc design processes become insufficient. Presently, more UAV manufacturers than ever have come to realize structured design processes are essential if they intend to develop reliable products. Furthermore, as regulations evolve, there are specific requirements for different rules. Hence a robust manufacturing and design infrastructure would be required and be earmarked for drone technology.

c. Establishment of drone Testing facility:

This facility would grant access to a free-fly zone where drone service providers and manufacturers can formulate better products/services quicker, thus giving a competitive advantage. By collaborating with existing organizations across the State, the government will build and enable access to free-fly zone and testing infrastructure for drone companies throughout the State. The facility will include all the necessities and the paraphernalia, which consists of the following: Ground Control Station, AirStrip for take-off and landing, Mechanical and electrical lab, On-site support specialists, Outdoor calibration and testing facilities, Recharging stations, etc.

The facility shall also provide drone component testing facilities, support in carrying out pilot projects and training / capacity building amenities for Government officials as well as citizens at large. The facility shall be built through a public, private partnership, including educational institutions, public players, and government.

d. Establishing Cloud Infrastructure

Data processing and storage is a critical element for most drone-based projects. Hence, the government will provide cloud services (Infrastructure as a service) to drone start-ups. Proper data protection mechanism would be put in place to ensure that only authorized users have access to the requested data stored in the cloud. Relevant mandates provisioned under the Data Protection Bill, 2019, GoI, would be strictly followed. The security controls throughout the data life cycle (i.e. data capture, transmission, storage, retrieval and destruction) would be stringently adhered to.

e. Rapid prototyping infrastructure

The Department would enable access to drone and payload components, set-up prototyping equipment specific to drone manufacturers as necessary, and partner with the state nodal agency and other institutions to access free-fly zones testing.

f. Support Cell

The State government has restricted jurisdiction over where and how drones are operated, their registrations and licensing. The roles of the state government and its agencies are confined to ensuring a proper balance between developing awareness of DGCA regulations and exploring potential options to assist its enforcement. A support cell will be created to facilitate a safe and sustainable usage of drones. The cell would guide and support the drone operators and manufacturers in activities related to getting all

the necessary approvals, permits, etc. from DGCA and local authorities. The cell would also help in providing real-time updates for the availability of testing facilities and other shared resources/services.

* All Supporting Infrastructure building endeavours mentioned in this section would be carried out under the aegis of DIT&E, GoWB

Key Vertical – III: Promoting Research and Innovation

The drone ecosystem will only prosper when there exists a constant flow of ideas. To ensure the advancement of research and innovation in this domain, the State will support the following:

a. The State will collaborate with corporates to commence the research fellowship that would sponsor researchers in drone technology.

b. The international liaison office of the West Bengal Drone Centre of Excellence (WBDCoE) will collaborate with global start-ups/companies and encourage such companies to start their operations in the State. Innovation, research, and prototype development shall be promoted in innovative solutions in drone design.

c. The government will facilitate the partnership of select industry players to set-up incubators or accelerators to promote innovation in drone technology. West Bengal will support select incubators and accelerators with specific packages/support, depending on the product/solution's strategic value.

d. The government will fund research programmes in drone technology by setting up research positions in premier institutes and provide funding to research scholars working in the drone technology domain.

e. In partnership with the industry and academia, the government will organize an annual academic conference for all drone researchers in the State to showcase their work. For researchers in West Bengal who get recognition for drone-tech-based research at several critical international platforms, it will be facilitated.

* All Research and Innovation promoting endeavours mentioned in this section would be carried out under the aegis of DIT&E, GoWB

Key Vertical – IV: Government facilitations

In order to promote the Information Technology (IT) and Electronics sectors, the government has already come up with dedicated policies. To further boost the drone industry, the government shall extend the following incentives to drone and drone component manufacturers and service providers.

a. **Data storage, computation and application hosting facilities in West Bengal State Data Centre** – Drone tech organizations are experiencing exponential growth in drone related data due to trends such as video surveillance imagery and its analysis, formulation of 3D reconstructions and high-resolution multispectral imagery and ortho-mosaic maps, corresponding data analytics et al. Hence, to benefit select organizations working in the domain of Drone technology, the State Government would provide facilities to store data, execute analytical computations and host mission-critical applications and systems in the State Data Centre at a nominal fee.

b. **Access to anonymized Public transactional data**: The State Government through its public transactional data sharing platform, would provide access to the anonymized public transactional data to Drone tech organisations in order to support them in conducting Proof of Concepts (PoCs), providing analytical solutions etc. Proper data protection mechanism would be put in place to ensure that only authorized users have access to the requested data. Relevant mandates provisioned under the Data Protection Bill, 2019, GoI, would be strictly followed.

c. **Support in talent searching, recruitment and training:** The State Government would help the drone tech companies in searching and selecting the right talents from the skill-registry platform of Government i.e. KarmoBhumi (https://karmobhumi.nltr.org) and/or market as well as helping them to get trained into specific aspects of drone technology. Domain-led skill building programmes for definite requirements like surveillance, aerial photography, remote sensing, etc. would be undertaken.

* All Government facilitation and related endeavours mentioned in this section would be carried out under the aegis of DIT&E, GoWB

7. Use Case Selection and Prioritization

For Drone Technology to be successfully adopted in West Bengal, the Government of West Bengal would select and prioritize the use cases for the implementation of Drone powered initiatives. The Government would prioritize the areas of Governance where Drone Technology will have a significant socio economic impact. Initially, the following areas would be taken up for Drone tech. implementation, which may be further expanded in future based on requirements.

i. Agriculture:

Drone surveillance using high-resolution, geo-referenced, ortho-mosaic 2D maps, spectral imagery and visual imagery can be used to capture the growth cycle and assess crop health to detect any potential problems swiftly as well as to assess damage and contain crop losses. Site-specific crop damage reports can be generated for appropriate action.

Seeding and Spraying Drones are effectively and efficiently reducing farming cost in difficult hilly and plain terrain. Drones have the capability to analyse and spray optimum dosage of insecticides and pesticides to prevent crop loss as seen during the Locusts Outbreak in other parts of the country.

Soil quality can be monitored using parameters such as soil moisture through remote sensing, which can help develop fertility maps, and consequently assist in planning for more optimal crop rotation or irrigation. Through drone captured image processing and analysis, ascertaining areas within a field that are most fertile or those that require additional water/fertilisers or chemicals can help farmers to optimise their resource utilisation.

ii. Disaster Mitigation:

When natural disasters like floods and cyclone strike – drones act as first responders and help disaster management teams to assess extent of calamity in inaccessible areas. This aids in prioritizing cost effective rescue and relief operations as well as rehabilitation of damaged physical infrastructure like power lines, arterial roads, bridges and railway or airport assets.

iii. Municipal Authorities:

Urban Local Bodies, are always stressed to conduct structural audit and renovation plans for urban infrastructure like bridges, flyovers, overhead water reservoirs because of the complex structure and inaccessibility due to height. By deploying drones, high resolution images can be captured and analysed for flattened bearings, cracks, corrosion, deformations and any non-conformity.

Urban planning - Increased visibility of developmental and expansion activities with accurate alignment of roads, canals and drains can assist in urban planning. Moreover, digital elevation models help in understanding terrain stability while planning highways or residential ventures. Property tax calculation and other estimations can be carried out using drone surveillance outputs remotely and accurately.

iv. Transport:

Roads with heavy traffic movement can be routinely inspected to identify potholes or waterlogged areas, which often lead to accidents. For example, a drone can monitor highway and provide a report on road condition. This data can be used by the Public Works Department for tendering maintenance contracts.

City traffic maps can be created to get real-time information on traffic jams, accidents, etc., which will help in planning appropriate diversions to decongest specific areas. Furthermore, video analytics is expected to drive decision making and assist in traffic management and route planning.

Real-time information on both vehicular and pedestrian traffic movement and congestion will enable evidence based decisions on new roadway constructions, traffic signal requirements, pedestrian signal requirements, etc.

v. Pollution Control:

The State government is faced with a major challenge of arresting pollution in the state's rivers, canals, water bodies as well as environment pollution. Drones attached with Bathymetric Lidar can detect underwater discharge points within a canal, thereby providing authorities data of untreated sewage and effluents, with pin-pointed accuracy when deployed over affected areas and can trace the origin of such pollution – be it an unauthorized industry or slum settlement.

Air pollution (AQI) in the industrial areas can be measured by using drones with air sensors to get PM2.5, PM10, NO_2 and SO_2 concentration in ug/m^3 . Drone Data can also be plotted on a map and be analysed to reveal pin point pollution heat maps.

vi. Law Enforcement Agencies:

With growing incidents of terror strikes, internal security is gaining equal importance as external security. UAVs / Drones are highly effective in crowd management and crowd control during festivals, mass gatherings as well as local security surveillance. Drones can livestream videos while overflying crowds and using facial recognition technology can single out suspects which are

brawling. Drones with searchlights and megaphones have been effectively and popularly used in India to effectively manage lockdown during the times of pandemic.

vii. Healthcare

Thermal imaging, combined with topographic, weather and population density data, can help in developing heat maps to ascertain breeding zones for mosquitoes / other such vectors carrying dengue, malaria, chikungunya, etc.

Information on exposed garbage piles, open drains and sewers, dead animals on roads, etc., can be captured and used to control health hazards.

India, with its varied topography from hills to dense forests to marshy river deltas, can use drones for timely delivery of essential medicines, test kits and vaccines to these hard to reach areas.

viii. Environment and Forest:

Global warming and its effect is sounding an alarm bell all over the world as millions of hectares of rain forest are being destroyed. Drones can be effectively used as an *eye in the sky* to track illegal deforestation in notified forest areas. Deploying drones by forest beat officers will help them achieve their mission efficiently, effectively and without additional manpower and associated costs. Artificial afforestation projects can also be monitored and increase in green cover, district-wise, measured accurately by drones.

ix. Irrigation and Waterways:

A major challenge in this domain is condition monitoring of thousands of kilometers of embankments along the rivers and canals. Any breach or erosion will lead to flooding of the area and damage to crops and property. With diverse terrain conditions physical inspection is not economically feasible. Only a remotely piloted aircraft or draft can capture the images for analyses and action by department engineers.

For flood protection schemes the departmental engineers need accurate slope measurements (trapezium structure with z co-ordinate) over vast areas of rivers basin – this can be accurately and efficiently captured only by deploying drones.

x. Tourism:

A high-resolution 360-degree view of tourist locations through drone allows for virtual reality tours to generate interest in tourist sites. Monitoring public assets and ensuring cleanliness of heritage sites using real-time videography and penalties for violators will help prevent littering and preserve the beauty and tourism value of these monuments. Assessment of tourist movements through time-lapse videos can assist in managing tourist traffic effectively and avoiding any security issues such as stampedes.

8. Implementation Framework

Following is the implementation strategy to achieve the end goals and objectives of the guidelines: *(The step by step process flow diagram is placed in the Appendix section)*

1. On behalf of Government of West Bengal, the **Department of Information Technology & Electronics (DoIT&E)** shall be designated as the **nodal department**. A designated officer nominated by the DoIT&E shall act as the nodal officer for entire gamut of activities involving clearance, setting up, implementation of drone technology in public interest.
2. **West Bengal Electronics Industrial Development Corporation Ltd. (WBEIDCL)**and/or any other organisation under its aegis, shall be notified by the Dept of IT&E to act as the **State Implementation Agency (SIA)** for all drone based initiatives, starting from promoting Drone Technology in West Bengal, building capacity through training programmes, meeting human resources recruitment, identifying technical upgradation requirement, helping in procuring specific machinery/ infrastructure, creating awareness on Drone Technology to facilitate the Drone operators and to develop an ecosystem for R&D, Start-Ups and Innovation in the state, *until directed otherwise*. The fees for SIA for executing such activities to be decided by the State Government in the Dept. of IT&E with concurrence from Finance Department and concerned entities (from which the need for drone technology implementation is originated).
3. The SIA would establish a **dedicated technical wing** for executing drone initiatives in the state. This wing would provide technical advisory/ implementation support for use case selection, and prioritization for Drone powered activities and provide end-to-end support to implement the Drone use cases in various departments of government.
4. The SIA would **empanel drone service providers** for providing drone-based services to government departments across various sectors including agriculture & allied sectors, fisheries, rural & urban, disaster management, police,

mining, tourism, and cross cutting areas such as project/asset monitoring, etc. The service provider is expected to undertake the drone-based surveys, capture high-resolution images/videos, prepare 2D maps & 3D models, evaluate captured data, and prepare other analytics-based outputs that can facilitate effective real-time governance.

5. Respective state government Departments would be engaging such drone service providers through a limited tender process among the empanelled Drone- services agencies of SIA as mentioned above. The entire process would be governed digitally using a single-window system.
6. The SIA would support the state Departments in this regard, starting from **preparation of bidding documents, bidding process management and implementation monitoring**. If required, the SIA would also support the departments in providing **ancillary activities** such as human resources recruitment, identifying technical upgradation requirement, helping in procuring specific machinery/ infrastructure, etc. It would also lay out a plan for Drone tech capacity building within West Bengal for Government Executives and Officers. The SIA would also be involved in the data-driven decision making support, monitoring, and evaluation of projects, and post-implementation operation and maintenance support.
7. The Empanelled agencies shall **adhere to the regulations/ policies/ legal procedures framed by the Directorate General of Civil Aviation (DGCA)**, Government of India on various Licenses and Permissions for Drone operation and must update the same as and when required.
8. The aforementioned technical wing of SIA would oversee the implementation of DGCA guidelines, **co-ordinate with state-level law and order and police departments** and support them in enforcement and regulatory activities for safe and secure drone operation in the state.

By order of the Governor,

Sd/-
Principal Secretary to the
Government of West Bengal.

No. 586-Estt/ITE-20012/2/2020 Date: 28/12/2020

Copy forwarded for kind information and necessary action to :-

- The Secretary to the Government of India, Department of Telecommunications, Sanchar Bhawan, New Delhi 110001.
- The Secretary to the Government of India, Ministry of Electronics & Information Technology, 6, CGO Complex, New Delhi-110003.
- The Additional Chief Secretary / Principal Secretary/ Secretary, Department(all).
- The Managing Director, WBEIDC Ltd, Block – EP & GP, Sector-V, Salt Lake, Kolkata-700 091.
- The Dy Director General, Telecom Enforcement Resources & Monitoring (TERM) Cell, West Bengal, 82, Ballygunj Place, 2nd Floor, Kolkata-700 019.
- The Dy. Director General, Telecom Enforcement Resource & Monitoring Cell, Kolkata Licensed Service Area, QA Bhawan, ,Block –EP&GP, Sector-V, Salt Lake, Kolkata-700 091.
- The Chief General Manager, BSNL, West Bengal Telecom, 1, Council House Street, Kolkata-700 001.
- The Chief General Manager, BSNL, Calcutta Telephones,34, BBD Bag (South), Kolkata -700001.
- The District Magistrate, District(all),West Bengal.
- The OSD to the Chief Secretary, Govt. of West Bengal.

- The PS to the Hon'ble MIC(IT&E Department),GoWB.
- The Sr. PS to the Principal Secretary to the Govt. of West Bengal, IT&E department.
- The Advisor, Telecom Regulatory Authority of India, Kolkata Regional Office, Bharat Bhawan, 1st Floor, 3, C.R. Avenue, Kolkata 700072.
- The Director General, COAI, Sector 2, 14, Bhai Vir Singh Marg, Sector 4, Gole Market, New Delhi, Delhi 110001.
- The Chief Executive Officer, Webel Technology Limited, BP-5,Sector-V, Salt Lake, Kolkata-700091.
- The Head(Operation), Tata Tele Services Ltd, PS-Srijan Tech Park, DN-52,12th Floor, Sector-V, Salt Lake, Kolkata-700 091.
- The Chief Operating Officer, Vodafone Idea Limited, 8, Major Arterial Road, Tower-C, DLF IT Park, 15th & 16th Floor, New Town, Kolkata-700 156.
- The Nodal Officer, Bharti Airtel Ltd, Infinity Building, 7th Floor, Sector-V, Salt Lake Electronics Complex, Kolkata-700 091.
- The Assistant Manager-Legal, Tower Vision India Pvt Limited, Signet Tower, DN-2,Unit No 1101, 11th Floor, Sector-V, Salt Lake, Kolkata-91.
- The Manager-Regulatory, Reliance JIO Infocomm Ltd, Ecospace, Business Park, 3B,4th Floor, Rajarhat, Kolkata-700 156.
- The Advisor, Indus Towers Ltd, Godrej Waterside, 8th Floor, Tower-I, Unit-801,Plot No-5, Block- DP,Sector-V, Salt Lake, Kolkata-91.
- The Head, American Tower Corporation India, 145, Rash Behari Avenue, 4th Floor, Kolkata-700 029.
- The Director General, TAIPA, 2nd & 3rd Floor, 7, Bhai Veer Singh Marg, Gole Market, New Delhi-110 001.
- The Circle Head, Aircel, 3rd Floor, Globsyn Crystal Building, Plot-11 & 12, Block- EP&GP, Sector-V, Salt Lake, Kolkata-700 091.

Joint Secretary to the
Government of West Bengal
Information Technology & Electronics Department

Appendix

Process flow diagram for the mentioned implementation framework is presented as under: