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SEEMANTA'25



A Souvenir Published on the occasion of
ASSAM STATE CONVENTION, 2025
SEEMANTA CHETANA MANCHA PURVOTTAR
Assam Pradesh

"The Border of the country is like Mother's attire, its protection is the primary duty of every child" Pitamah Bhishma

ਸੀਮਾਂਤ' ੨੫ SEEMANTA' 25



Assam State Convention, 2025
Seemanta Chetana Mancha Purvottar

Date : 26 & 27 July, 2025
Venue : SIPRD Campus, Kahikuchi, Guwahati, Assam

Editor
Debojit Mazumder

Published by
Seemanta Chetana Mancha Purvottar

Regn.No:RS/KAM(M)/263/0/314/16-17

Assam State Committee

Keshav Dham, K.B. Road, Paltan Bazar
Guwahati-781008, Assam

Seemanta' 25 : A collection of articles on Effective border management published by "Seemanta Chetana Mancha, Purvottar, Assam State committee, Guwahati-781008, Assam, on the occasion of Assam State Convention, 2025 held on 26th & 27th July, 2025 at SIPRD, kahikuchi, Guwahati, Assam.

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Printed at

Baju Associates, Lalganesh, Guwahati-34

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विदेश एवं वस्त्र राज्य मंत्री
भारत सरकार
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Government of India

MESSAGE

It gives me immense pleasure to extend my warm greetings to **Seemanta Chetana Mancha Purvottar** on the publication of the **Seemanta'25** souvenir during the Assam State Annual Conference. This souvenir is an insightful document that explores the opportunities and challenges in border areas, while offering valuable ideas to guide the way forward.

The theme, “**Effective Border Management**” highlights the vital importance of securing our frontiers while ensuring holistic development of border communities. Strengthening border management not only enhances national security but also builds resilience, fosters a spirit of solidarity, and empowers people living in these strategically significant areas. I commend the commitment of the organizers and volunteers who continue to work selflessly at the grassroots to realize this vision.

I am confident that the publication of *Seemanta'25* will inspire future generations and contribute meaningfully to the overall progress of the region, in alignment with the vision of *Viksit Bharat*. May this initiative further deepen the spirit of unity and dedication among all those working towards a secure and prosperous future for our nation.

(PABITRA MARGHERITA)

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ড° হিমন্ত বিশ্ব শৰ্মা
Dr. Himanta Biswa Sarma



মুখ্যমন্ত্রী, অসম
Chief Minister, Assam



CMS.7/2023/3001
Dispur
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19 July, 2025

MESSAGE

I am pleased to extend my warm greetings to Seemanta Chetana Mancha Purvottar on the occasion of its Assam State Annual Conference and the publication of the souvenir, Seemanta '25.

As Assam's international borders continue to serve as gateways for trade, culture, and connectivity, the importance of effective border management becomes increasingly evident. A comprehensive approach—encompassing enhanced surveillance, coordinated civil-security mechanisms, and active community participation—is essential to ensure safety, stability, and development in these sensitive regions.

The theme “Effective Border Management” is both timely and relevant, particularly for Assam and the Northeast. Strong and secure borders form the bedrock of national progress. While the Government remains committed to strengthening border infrastructure and cooperation, the role of civil society and local communities remains indispensable in safeguarding our frontiers.

I am confident that the discussions at this conference and the publication of Seemanta '25 will offer insightful perspectives on building secure, inclusive, and people-centric border policies.

As we work towards the vision of Ek Bharat, Shreshtha Bharat, I convey my best wishes for the success of Seemanta '25 and for the continued prosperity of Assam and the nation.

(Dr. Himanta Biswa Sarma)

INTEGRATION OF SMALL DRONES FOR EFFECTIVE BORDER MANAGEMENT BY INDIA



– Group Captain Rajiv Narang

Drones or Unmanned Aerial Vehicles (UAVs) are unmanned aircraft that are flown by the remote pilot through a control system or in an autonomous mode. They provide new capabilities in civil-military applications as well as pose security challenges. The drones due to their small size, ability to be launched from small spaces, ease of operations, ability to undertake surveillance of large territory and strike missions can significantly enhance the effectiveness of the border management.

India has two hostile and unpredictable neighbours with Pakistan to its west and China to its north. The recent development in Bangladesh added new challenges. Indian border guarding forces have to protect coastal areas to the south, deserts of the west, jungles in the East and high Himalayas in the North. Indian border is guarded by Indian Army and two Central Armed Police Forces (CAPF) namely Border Security Force (BSF) and Indo Tibetan Border Police (ITBP)¹. Their deployment is decided based on the type of border, threats, challenges and type of border guarding force.

Indian Army has wide variety of drones comprising Heron Medium Altitude Long Endurance (HALE), Searcher Tactical drones, and a number of small drones for surveillance, armed strike and logistics supply roles. However, it predominantly employed small drones for the management of the border. The BSF and ITBP too employ small drones for border management. The drones are currently

being deployed for surveillance of the borders to detect illegal infiltration by terrorists, illegal migrants, smuggling of drugs, weapons, counterfeit currency, cattle, etc. across the borders. However, there are nuances and challenges associated with the employment of drones for border management. The article examines three critical challenges associated with the employment of drones for border management, i.e. Real Time Tracking, Unmanned Traffic Management (UTM) system and lack of integration of small drones in the Air Defence Networks.

Real Time Tracking Challenge

The first challenges pertains to lack of real time tracking system on civil drones as well as on drones employed for border management. The drones employed for surveillance and other border management duties could face identification and air space integration challenges in the absence of real time tracking system. The real time tracking of drones can be undertaken by installing mobile sims on drones and using cellular networks or obtaining feed from Ground Control System (GCS), Global Positioning System (GPS), Satellite Communication System, etc. These systems need to be tested, validated and approved by Director General of Civil Aviation (DGCA), which is awaited. In the absence of real time tracking system, the border guarding forces could find their drone operating along with the rogue and civil drones and it could become difficult for air defence

operators to differentiate among them in real time. The lack of onboard systems for differentiation may create ambiguities and make it difficult for the air defence operators to neutralise hostiles drones especially while operating on or close to the border.

Lack of UTM

The second challenge for smooth operation of drones for border management is lack of Unmanned Traffic Management (UTM) System. The management of manned aircraft operation is done by air traffic system (ATS). However, drones operate at low level and the current ATS is not suitable for managing operation of drones. The operation of drones at low level in large numbers necessitate that drone traffic needs to be managed with a UTM system that has a high level of automation and such systems have been adopted by many countries. The DGCA has promulgated the policy on UTM but it is yet to operationalise it. The availability of UTM and installation of real time tracking system on own drones will ensure that all the complaint drones can be tracked in real time. The development and operationalisation of UTM would make it easier for the Air Defence Operators to segregate rogue or hostile drones and take measures to neutralise them, if required.

Drone Integration with AD Network

The third challenge pertains to lack of integration of small drones in the air defence networks of India. Bharat Electronics Limited has developed air defence network for the Indian Army that it has named as Akashteer. The Integrated Air Command and Control System (IACCS) of the Indian Air Force (IAF) acts as its AD system. Bharat Electronics Limited has developed air defence network for the Indian Army that it has named as Akashteer. The Integrated Air Command and Control System (IACCS) of the Indian Air Force (IAF) acts as its AD system.

The real time position of own small drones needs to be transmitted to AD network for integration. Also, integration would have enabled differentiation

of own drones from rogue or hostile drones, and prevent fratricide. However, these drones are not integrated with the air defence networks due to lack of policy and real time tracking system on drones, non availability of UTM and non-provision of real time operating position of own drones to AD systems. The lack of common standards for acquisition of drones by IA and its CAPF counterparts, i.e. BSF & ITBP add to integration challenges. The integration of drones in AD networks is essential for enhancing the effectiveness of employment of drones for border management.

Upgradation of CUAS Systems and Networks

The fourth challenge in employment of drones in border management is limitation of existing Counter Unmanned Aerial System (CUAS) systems and scope for improvement. The CUAS, also known as counter drone system or anti-drone systems have been developed to counter the threat posed by small drones that the existing Air Defence (AD) networks were not able to neutralise. The existing AD systems are unable to neutralise small drones because their detection systems, i.e. radars, etc were designed to pick up fast, large manned fighter aircraft that flew relatively at higher height and are launched from far off enemy bases. The drones being small, having low speed and ability to be launched from small and restricted spaces, and ease of operations necessitated development of CUAS. The radars, command and control and neutralisation systems of current CUAS have limitations in terms of detection ranges, ability to identify, track and neutralise rogue drones. Also, they can not differentiate between own drones or drones launched by the adversary. Therefore, CUAS systems need to be improved to enhance the level of assurance of detection and neutralisation of the threat posed by rogue or hostile drones.

Way Forward

The employment of drones for border management has significantly enhanced surveillance capabilities along the challenging hilly, desert, forest

and plain terrains of India. IA, BSF and ITBP have benefitted from unique capabilities of drones; however, there are certain technology and capability gaps due to lack of development and adoption of enabling technologies and integration of drones in the Indian airspace. The Ministry of Civil Aviation (MoCA) needs to take technology development and validation initiatives to develop and operationalise enabling technologies like remote tracking and civil UTM. The BSF, ITBP and other CAPFs would need to create their own drones and counter drone networks and integrate those networks with the CUAS and Akashteer air defence networks of the Indian Army and IACCS of the IAF. Also, the current CUAS networks need to be upgraded by developing better radars, jammers and neutralisation systems to detect and neutralise rogue drones that are often seen operating clandestinely across the border by India's adversaries.

The border management is transitioning from managing the land border threats to managing the combined threats from the land and air due to

increasing employment of drones by India's adversaries in clandestine manner for smuggling and anti-India activities. India's technology development initiatives like Innovation for Defence Excellence (iDEX) of the Department of Defence Production (DDP) of the Ministry of Defence, Mehar Baba Swarm Competition of the Indian Air Force (IAF) and creation of Indigenously Designed Developed and Manufactured (IDDM) provision in the Defence Acquisition Procedures (DAP), have played significant role in indigenous development of variety of drone and CUAS technologies and these initiatives need to be further leveraged and adopted by CAPFs for developing and upgrading enabling technologies as well as integrating drones in Indian airspace and air defence networks. The MoCA, BSF, ITBP and other CAPFs need to launch technology development and validation initiatives to fill drone, counter drone and drone networks technology gaps and integrate own drones with AD networks of IA and IAF to prepare India for emerging challenges.

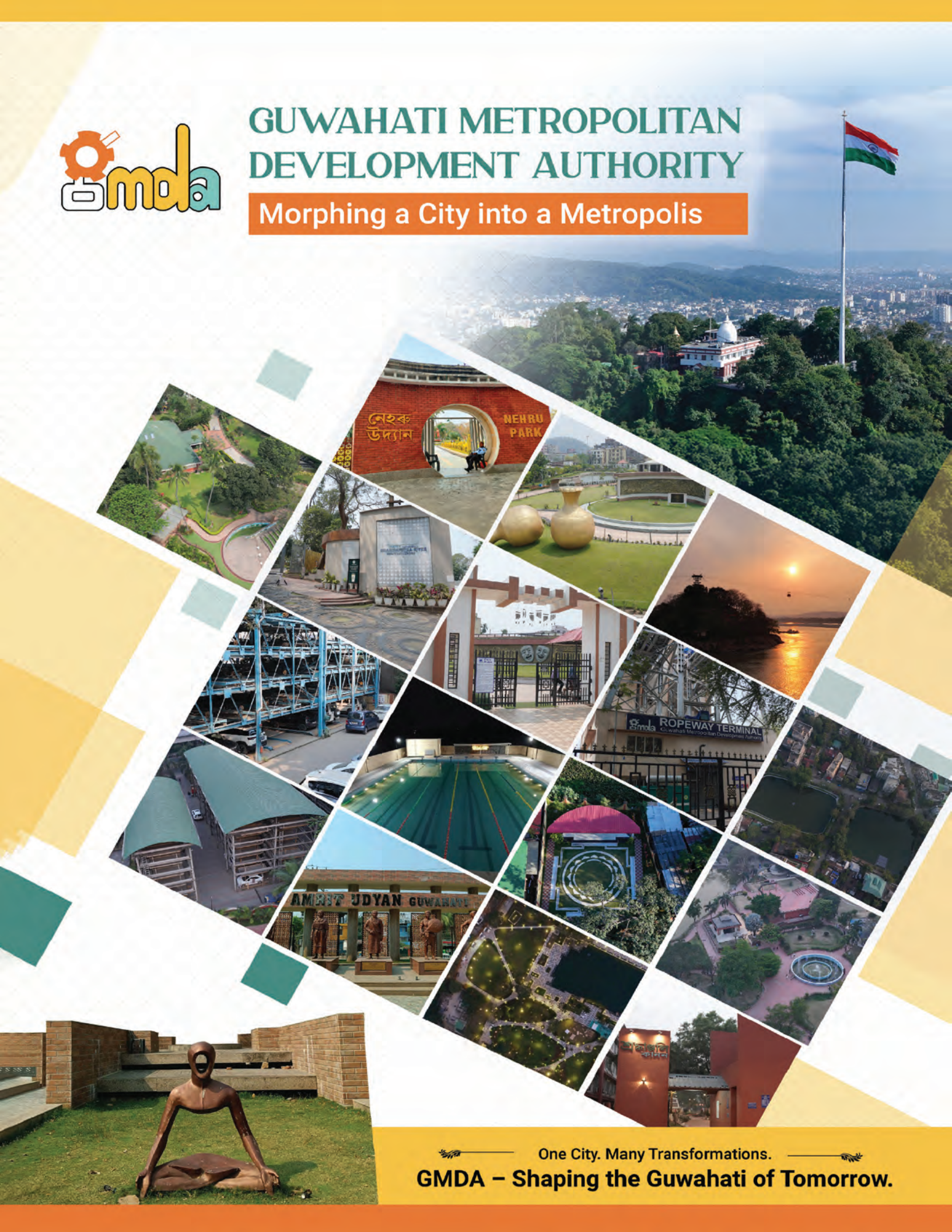
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