

**MEMORANDUM OF UNDERSTANDING (MOU)**

**Between**

**SURVEY OF INDIA, GOVT OF INDIA**

**And**

**GOVERNMENT OF TRIPURA**

**For**

***DRONE BASED LARGE SCALE MAPPING OF RURAL  
HABITED AREAS IN THE STATE OF TRIPURA***

***Signed on this day 26<sup>th</sup> of April 2021***

# Memorandum of Understanding between Government of Tripura and Survey of India (Sol), Government of India

The **Memorandum of Understanding** is made and entered into on the 26<sup>th</sup> day of April month of the year 2021

## Between

The **President of India**, acting through Surveyor General of India, Sol, Ministry of Science and Technology, Govt of India having Office at Hathibarkala Estate, Dehradun-248001; hereinafter referred to as Survey of India (which expression shall, unless excluded by or repugnant to the context, be deemed to include his successors in Office and assignee) of the **First Part**.

## And

The **Governor of Tripura**, acting through *the Joint Director (Nodal Officer)*, Department of **Land Records & Settlement, Government of Tripura** having office at Palace Compound, Agartala, Tripura (West), Pin-799001; hereinafter referred to as Government of Tripura (which expression shall, unless excluded by or repugnant to the context, be deemed to include his/her successors in Office and assignee) of the **Second Part**.

WHEREAS the Survey of India is the National Mapping Agency engaged in Surveying and Mapping of whole country including Towns, Villages, Cities and States and in publishing topographical and general-purpose maps in analogue and digital form.

AND WHEREAS, Survey of India is the owner of its analogue and digital map data and presently engaged in updating of topographical maps of State of Tripura

AND WHEREAS Government of Tripura has approved to undertake the work as per SVAMITVA scheme by Survey of India to supply updated large scale topographical Maps of **the rural abadi (inhabited) areas** of villages in analogue and digital GIS form containing Spatial and non-spatial data.



## 1. BACKGROUND

Large scale mapping on 1:500 scale of the rural abadi (inhabited) areas using Professional Survey Grade UAV/Drone is to be undertaken by the Government of Tripura.

Survey of India has agreed to generate up-to-date digital topographical maps (GIS data) of **rural abadi (inhabited) area** of villages as per SVAMITVA scheme guidelines using Professional Survey Grade UAV/ Drones. Geodetic infrastructure comprising Continuous Operating Reference System (CORS) Network and Geoid model will also be established.

GIS data comprising rural abadi property boundaries, topographical features, attributes collected from ground shall be prepared jointly by Sol and Government of Tripura as per SVAMITVA scheme guidelines. The non-spatial attribute data shall be provided by State government preferably in digital format

The nodal Department for this project is State Revenue Department, Government of Tripura.

## 2. SCOPE OF THE WORK

2.1. Establishment of Continuous Operating Reference System (CORS) Network (*wherever applicable as per approved EFC proposal*): Survey of India (Sol) will procure and establish CORS Network in the state including operations and maintenance for next 05 years. Following work stages will be completed by Sol:

2.1.1. Completion of the tendering process for outsourcing

2.1.2. Site selection & Recce for CORS stations

2.1.3. Civil construction work by outsourced agency

2.1.4. Installation & commissioning of CORS stations by outsourced agency

2.1.5. Establishment of Control Centre & DR in Sol premises

2.1.6. Operation and Maintenance of CORS Network for next 05 years

2.2. Development of Geoid model for entire state.

2.3. Notification for Drone Survey in the target areas by State Govt.

- 2.4. Marking of property boundaries with Chuna lines by the State Government before the drone flying in the area.
- 2.5. Acquisition of Aerial images using Professional survey grade drone/ UAVe.
  - 2.5.1. Procurement of Drones, Drone Flying of rural unmapped abadi/habited/Lal-dora/Gaothan (**inhabited**) areas of villages by Survey of India
  - 2.5.2. Drone data acquisition at better than 5 cm Ground Sample Distance (GSD).
  - 2.5.3. Drone data Processing by Survey of India involving Block Adjustment & AT (Aerial Triangulation), Ortho Rectified Image (ORI) generation, DEM (Digital Elevation Model)/DTM(Digital Terrain Model) generation.
- 2.6. Extraction of 2D features and generation of digital spatial data as per SVAMITVA scheme guidelines.
- 2.7. Attribute linkage of all attribute data provided by State Govt as per jointly finalised schema by State Govt & Sol. Attribute data should be provided in digital form for integration.
- 2.8. Numbering of properties will be entered as per numbering system provided by the State government.
- 2.9. Ownership data collection and Ground validation of property ownership boundaries will be done by State Government of Tripura.
- 2.10. Ground-Truthing and validation of topographical features shall be carried out by Sol.
- 2.11. Generation of final GIS data, Village maps, Land Parcel Maps will be prepared by Sol in suitable soft copy and printing formats.
- 2.12. Training of state government technical staff by Survey of India.
- 2.13. **Study Area:** The project shall be carried out in the state covering all rural **abadi (inhabited)** areas under SVAMITVA scheme.

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2.14. **Ownership of Data:** The ORI shall be jointly owned by the Ministry of Panchayati Raj, the Survey of India, Government of India and Govt of Tripura .All the processed data products and the final data products generated will be jointly owned by Ministry of Panchayati Raj, Survey of India, Government of India and Govt of Tripura. All three agencies (Ministry of Panchayati Raj, Survey of India, Government of India and Govt of Tripura, shall have the rights to use the data generated under this project for their internal applications. For any 3rd party usage / sharing of data by any of the three agencies, the modalities shall be decided by Ministry of Panchayati Raj in consultation with Survey of India and the State Government.

### 3. METHODOLOGY

3.1. All clearances for drone flying will be taken by Sol. [*Responsibility:* Survey of India]

3.2. Horizontal and Vertical Ground Control Points

3.2.1. Identification, Establishment, Densification and Utilisation of Ground Control Points (GCPs) using Sol GCP library points. In areas covered with CORS Network GCPs shall be carried out using CORS Network rovers.

a. CORS Network shall be established by Sol in State under SVAMITVA scheme. [*Responsibility:* Survey of India]

b. Area / site for CORS stations installation shall be provided by State Government. These stations should have electricity supply and physical security to be ensured by State Government. [*Responsibility:* Government of Tripura.

c. The Sol shall be responsible for operation and maintenance of CORS network stations and to provide CORS network services to State Government for next five years. [*Responsibility:* Survey of India]

3.2.2. Existing Geodetic BMs (Benchmark) of Sol shall be utilised for vertical ground control point extension and geoid model development. [*Responsibility:* Survey of India]

3.3. Property boundaries will be marked with Chunna lines by the State Government before the drone flying in the area. Government of Tripura will organise the Gram Sabha to intimate the schedule of the survey and to sensitize the villagers about the project work and its intended benefits. [*Responsibility:* State Government]

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- 3.4. Extent of the rural **abadi (inhabited) area** for drone based mapping will be provided in digital form or with co-ordinates or as .kml file for mission planning for drone flying. [Responsibility: State Government]
- 3.5. Acquisition of Aerial images using drone shall be carried out by the Sol for the extent of area given in SI 3.4. [Responsibility: Government of Tripura and Survey's of India]
- 3.6. Drone data Processing will be carried out by Sol involving Block Adjustment & AT (Aerial Triangulation), Ortho Rectified Image (ORI) generation, DEM (Digital Elevation Model)/DTM(Digital Terrain Model) generation. [Responsibility: Survey of India]
- 3.7. 2D Feature Extraction (FE)**
- 3.7.1. The ORI shall be used as base image layer to extract the topographical features as per jointly finalised schema by State Govt & Sol. [Responsibility: Survey of India]
- 3.8. Attribute Data Collection**
- 3.8.1. Attributes data shall be provided by concerned State Government of Tripura as per feature/ wish list. A standardized data collection format shall be provided as an effort to simplify and speed up the process. The correctness of attribute data shall be the responsibility of respective State Government of Tripura. [Responsibility : State Government]
- 3.8.2. The attributes collected/provided (as in point 3.8.1) shall then be linked with their respective features, thereby creating a digital spatial library of all the features and their respective information.
- 3.9. Boundaries of properties and numbering of properties/structures within village abadi area /Lal dora area will be as per numbering system provided by Government of Tripura. [ Responsibility: Survey of India]
- 3.10. Generation of updated Land Parcel Maps (LPM) in suitable soft copy formats and in printing formats. GIS data prepared shall comprise base map overlaid with layers of topographical features, land parcel information, district/tehsil/village boundaries information, etc with attributes as provided by the state government. [Responsibility: Survey of India]
- 3.11. Ownership data collection and Ground validation of property ownership boundaries will be done by State Government of Tripura.

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3.11.1. Ground validation of topographical features as derived from ORI shall be carried out by Sol. [Responsibility: Survey of India]

3.11.2. Inquiry process for finalising the objections shall be carried out by respective State Government [Responsibility: State Government]

#### 4. DELIVERABLES

Following shall be output of the entire project covering entire consolidated Feature list:

- 4.1. CORS Network RTK service of  $\leq 5$  cm horizontal accuracy for five (05) years.  
(Applicable if this component for a state is funded under SVAMITVA scheme)
- 4.2. Accurate geo-referenced digital maps based on National Spatial reference framework of the country.
- 4.3. Village Map and LPM on 1:500 Scale (hard Copy) with  $\pm 10$  cm Horizontal accuracy (Plain areas).
- 4.4. DEM of  $\pm 20$  cm vertical accuracy for the village abadi area of plain terrain.
- 4.5. Hard copy maps on 1:500 scale, 04 No's each for final village map on good quality 90 GSM paper along-with pdf copy for future printing purposes.
- 4.6. Training courses for technical staff of Government of Tripura at various levels in NIGST, Hyderabad.

#### 5. ROLES AND RESPONSIBILITIES

##### 5.1. Survey of India (Sol)

- a. Project shall be executed in Sol premises. Work space to the 3rd party or modernisation of available space in terms of computers/peripherals/servers/data centre shall be provided or looked after by Survey of India.
- b. Responsibility for activities will be as given in item number 3, (Methodology).
- c. Sol shall be responsible for Project planning, Execution and monitoring of activities and shall adhere with the norms as laid by Government of India.
- d. For outsourcing of any activity under the project, Sol will be responsible for preparation of RFPs/Bids, Processing of bids, Award of work, Supervision, Quality checking and Work execution as per contract agreement as per the norms laid down by Government of India.

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- e. The Sol shall use their hardware and software and their GIS Lab for data Processing and production.

## 5.2. Government of State Tripura.

- a. Responsibility for activities will be as given in item number 3, (Methodology).
- b. Each Drone flying team shall be accompanied by at least one employee from Revenue Department and one employee from Police Department. State Government shall provide the Site/land for CORS station at the sites mutually decided as per technical requirement. The sites should have electricity supply, cellular network coverage, Uninterruptible power supply (UPS) and physical security of equipment.
- c. To finalise the schema for feature layers as per functional requirement in consultation with Sol.
- d. The State Government of Tripura shall be responsible for the accuracy and correctness of attributes data provided to Sol. The attribute data shall be provided by in the digital format.
- e. Store (Hard Copy , digital data and GIS data ), Host and update (as per requirement) the data created under the Drone Pilot Phase.
- f. Finalisation of the revenue records duly following the inquiry process & dispute resolution (if any) for issuance of property cards or ownership rights will be the responsibility of Government of Tripura.
- g. To complete the inquiry process & dispute resolution
- h. Updation of Property data and maps – The State Government shall be responsible for any future updation of Rural abadi property data.

## 5.3. Joint Responsibility

- a. A Memorandum of Understanding to be signed between Survey of India and Government of Tripura for execution of this project.
- b. Expenses towards travelling, lodging, boarding of Government of Tripura personnel for training at NIGST, Hyderabad will be borne by Government of Tripura. Expenses towards tuition fee, training material, External expert faculty etc will be borne by SOI.

## 6. MONITORING & IMPLEMENTATION COMMITTEE

- 6.1. Sol will establish a separate Project Wing with one dedicated Nodal Officer exclusively responsible for execution of the project in the State.

*[Handwritten initials]*



- 6.2. At the State level, each State will set up a **State Steering Committee (SSC)** for endorsing plans submitted by the implementing agencies & forwarding the same to National Steering Committee in Ministry of Panchayati Raj for approval, and for monitoring the scheme, etc. Project to be monitored under the supervision of the SSC constituted by State Revenue Department, comprising of officials from State Panchayati Raj department, State Revenue department, representative of Finance Department, Survey of India (State Representative), MoPR official not below the rank of Under Secretary. State shall have the authority to co-opt additional members. The SSC shall have oversight and monitoring functions and shall provide guidance for the smooth operation of the scheme in the respective state. It will also provide update to **National Steering Committee (NSC)**, Constituted at Ministry of Panchayati Raj. The structure and terms of reference may be defined on mutual agreement with all the parties.
- 6.3. **District-level Monitoring and Review Committee (DMRC)** would be constituted under the Chairpersonship of the District Collector/Deputy Commissioner/District Magistrate, along with ADMs/SDMs dealing with land revenue matters, CEO/Executive Officer of the Zila Parishad, Sub-district Registrar, Survey & Settlement/Consolidation Officer having jurisdiction over the district, District Panchayati Raj Officer and Block Development Officer. Representative from Sol may be involved as per the need as special invitees. The Committee will review the progress of implementation of the Programme at least once a quarter or as prescribed in the Scheme Guidelines to be prepared by the ministry of Panchayati Raj, and the District Collector/Deputy Commissioner shall submit report to the State Steering Committee. Also, the committee would monitor/ oversee the use of IEC funds.
- 6.4. Survey of India shall prepare detailed Annual Plans in accordance with the SVAMITVA Scheme Guidelines for appraisal and approval by the NSC.
- 6.5. SVAMITVA scheme will be implemented through the regular departmental mechanisms, which will be assisted by Programme Management Unit at the State levels.
- 6.6. Online monitoring and reporting system for SVAMITVA Scheme to be put into place.
- 6.7. Transaction based PFMS to be introduced for release and tracking of SVAMITVA Scheme funds.

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## 7. UPDATION OF PROPERTY DATA & MAPS

The State Government shall be responsible for future updation of rural abadi property data.

The mechanism and surveying agency shall be decided by State Government for future update of Property data and maps.

## 8. TIME SCHEDULE

The entire project will be completed within the stipulated time period as approved in SVAMITVA scheme.

## 9. Service Level Agreement:

Timelines for completing this activity would be as per the Guidelines of SVAMITVA Scheme issued by Ministry of Panchayati Raj.

## 10. FINANCIAL TERMS AND CONDITIONS

### A. Cost:

The total per village mapping cost shall be as per SVAMITVA scheme. Both the parties understand and do agree that the actual cost of the project will be calculated on the basis of no. of villages surveyed & mapped after the completion of the work.

As per the guidelines of SVAMITVA Scheme issued by Ministry of Panchayati Raj, the cost of following components would be borne by Ministry of Panchayati Raj

- i. Establishment of CORS network
- ii. Large Scale Mapping of rural abadi area/ laldora abadi area using Drone survey technique
- iii. IEC
- iv. State project Management Unit

*Any other cost would be borne by State Government as per mutual agreement with Sol (at the time of signing of MoU)*

**NOTE: Additional costs due to enhancement of the scope of drone based large scale mapping work component under the scheme would be charged from MoPR.**

 

## **B. Release of Payment**

Payment to above mentioned component would be released as per Guidelines of SVAMITVAScheme issued by Ministry of Panchayati Raj

*Release of payment of any other cost borne by State Government, would be defined as per mutual agreement with Sol at the time of signing of MoU*

## **11. OTHER ASPECTS OF MOU**

### **11.1. Arbitration**

In the event of any dispute or difference relating to the interpretation and application of provisions of this MoU, such dispute or difference shall be referred by either Party for Arbitration to the Sole Arbitrator i.e. The Secretary to the Govt. of India Ministry of Panchayati Raj. The Arbitration and Conciliation Act 1996 and the Arbitration and Conciliation Act 2015 shall not be applicable to arbitration under this clause. The Award of arbitrator shall be binding upon the Parties to the dispute, provided, however, any party aggrieved by such Award may make a further reference for setting aside or revision of the Award to the Law Secretary, Department of Legal Affairs, Ministry of Law and Justice, Govt. of India. Upon such reference, the dispute shall be decided by the Law Secretary or the Special Secretary/Addl. Secretary, when so authorized by the Law Secretary, whose decision shall bind the parties finally and conclusively. The Party to the Dispute will share equally the cost of Arbitration as intimated by the Arbitrator.

### **11.2. Indemnity**

Each party shall indemnify and hold harmless the other party and its trustees, officers, employees from and against any claims, actions, damages, expenses (including reasonable fees and costs), liabilities and costs arising from or relating to the services of either party under this Agreement.

### **11.3. Relationship - Principal to Principal**

All dealings between Sol and Government of Tripura shall be as Principal to Principal. This MoU does not in any way create, establish or deem to imply the relationship of principal and Agent or partnership between Sol and Government of Tripura

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#### 11.4. Force Majeure

Neither party shall be held responsible for non-fulfilment of its respective obligations under this MoU to the exigency of one or more of the force majeure events lying beyond the responsible control of affected Party, such as but not limited to, Acts of God, War, Flood, Earthquakes, Epidemics, Riots, Civil commodities etc. provided on the occurrence and cessation of any such events, the party affected thereby shall send a notice in writing to this effect to the other party immediately after, but not later than one month of such occurrence and/or cessation. The period between the occurrences and cessation of such events will be excluded while calculating the period during which the party has to perform its obligations under this MoU. If the force majeure conditions continue beyond six months, the parties shall then mutually decide about the future course of action.

#### 11.5. Governing Law and Jurisdiction

This MoU shall be governed by and constructed in accordance with Indian laws.

IN WITNESS WHEREOF the Parties hereto have duly executed this MoU as on date above written.

#### State Govt. of Tripura

#### Survey of India

By signing this MoU, I also confirm that I am authorized to sign on behalf of, Government of Tripura

Signature:

*[Handwritten Signature]*  
26/4/21

Name: Sankar Chakraborty

Title: State Nodal Officer (Joint Director, Land Records & Settlement)

Date: 04/26/2021

Witness

1. Santimay Debbarma, IAS  
Dt. Director, LRS.
2. TAPAS CHAUDHURI, SA

By signing this MoU, I also confirm that I am authorized to sign on behalf of Survey of India

Signature:

*[Handwritten Signature]*  
26.04.2021

Name: SUDHANSHU BHUSHAN SHARMA

Title: DIRECTOR TMMz GDC, SILCHAR  
NODAL OFFICER SOI FOR  
TRIPURA

Date: 04/26/2021

Witness

1. Bharat Kumbhar  
Supdt. Surveyor
2. ARUN Kumar Verma  
Superintending Surveyor