FRAMEWORK FOR IMPLEMENTATION OF SVAMITVA SCHEME

SURVEY OF VILLAGES AND MAPPING WITH IMPROVISED TECHNOLOGY IN VILLAGE AREAS



Panchayati Raj

MINISTRY OF PANCHAYATI RAJ
GOVERNMENT OF INDIA

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GUIDELINES (2020)

Panchayati Raj

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MINISTER OF AGRICULTURE & FARMERS' WELFARE,
RURAL DEVELOPMENT AND PANCHAYATI RAJ
GOVERNMENT OF INDIA
KRISHI BHAWAN, NEW DELHI



MESSAGE

Gramoday se Bharat Uday has been a central theme in all policies and programmes of the Government of India.

It is our resolve to fulfil Mahatma Gandhi's dreams of an ideal village by the year 2022 that will mark 75 years of India's Independence. On this occasion the **SVAMITVA** scheme is being launched which will enable the aim of survey of inhabited areas of villages with the use of progressive technology.

SVAMITVA scheme would be proved a mile stone in providing the 'record of rights' to each of the village household owners in inhabited rural areas in villages. The scheme would be helpful in achieving the following two aims:-

a. Enable households to use their immovable property as a financial asset for taking loans and other financial benefits from Banks;
b. Strengthen development of rural infrastructure and demand assessment process of Gram Panchayats by institutionalising the asset and Tax collection register.

I congratulate the team at the Ministry of Panchayati Raj for preparing this detailed Guidelines in a very short time and look forward to effective implementation of the project across the States & Panchayats in the coming years.

(Narendra Singh Tomar)

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MINISTRY OF PANCHAYATI RAJ



MESSAGE

Land as an asset is unique because it is immovable, and with growing population, its demand keeps increasing, while its supply is limited. Access to land (or land rights) has a wide-ranging impact on livelihoods, economic, and social growth.

Land records, as are available today, do not reflect the on-ground position. The owner of the property in the rural areas are not able to leverage their own property as a financial asset in the absence of any legal document acceptable to the banks. Moreover, survey of rural land in India for settlement and record of rights, which were last completed about 70 years back, did not cover ABADI (inhabited) area of villages in many States.

SVAMITVA scheme, a collaborative effort of the Ministry of Panchayati Raj, State Panchayati Raj Departments, State Revenue Departments and Survey of India, aims to provide an integrated property validation solution for rural India, engaging the latest Drone Surveying technology, for demarcating the inhabitant (Aabadi) land in rural areas. The scheme targets to

- Protect the Civil rights of villagers, and reduce disputes over land ownership in Rural habited areas through issuance of Property card to the rural household owners;
- Increase the coverage of property tax collection in the Panchayats through automated tax collection records;
- Prevent encroachment by identifying public land;
- Enable creation of better-quality Gram Panchayat Development Plans (GPDPs), leveraging the maps created under this programme.

These Operational Guideline seeks to map out the implementation of this scheme based on the principles of strong cooperation and collaborative federalism. I wish the States and all stakeholders all the best in the implementation of the scheme using these Guidelines.

(Sunil Kumar)

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ABBREVIATIONS

CORS	Continuous Operation Reference System
DEM	Digital Elevation Model
DGCA	Directorate General of Civil Aviation
DILRMP	Digital India Land Records Modernization Programme
DoLR	Department of Land Records, Ministry of Rural Development
DR	Disaster Recovery
DTM	Digital Terrain Model
GCPs	Ground Control Points (GCPs)
GIS	Geographic Information System
GoI	Government of India
GP	Gram Panchayat
GPDP	Gram Panchayat Development Plan
GSD	Ground Sampling Distance
GSM	Global System for Mobile Communication
IEC	Information, Education and Communication
LPM	Land Parcel Maps
MHA	Ministry of Home Affairs
MoD	Ministry of Defence
MoPR	Ministry of Panchayati Raj
MoU	Memorandum of Understanding
NPMU	National Programme Management Unit
OGC	Open Geospatial Consortium
ORI	Ortho-rectified images
PPK	Post Point Kinematic
RGB	Red Green Blue
RTK	Real Time Kinematic
SoI	Survey of India
SPMU	State Programme Management Unit
UAV	Unmanned Aerial Vehicle
UPS	Uninterruptible power supply
UT	Union Territory
UTM	Universal Transverse Mercator
WGS 84	World Geodetic System 1984
Abadi areas	The abadi area includes inhabitant land, inhabited areas contiguous to Abadi and wadis/basties in rural areas

EXECUTIVE SUMMARY

The Government of India has decided to implement a scheme for surveying the land parcels in rural inhabited area using Drone technology. The survey shall be done across the country in a phase wise manner over the period of four years (2020 - 2024)

The scheme is proposed as a Central Sector scheme titled "**SVAMITVA** – Survey of villages and mapping with improvised technology in village areas", with a projected outlay of Rs 79.65 crores for the pilot phase (FY 2020 -21)

The outcome from the scheme would include updating the 'record-of-rights' in the revenue/property registers and issuance of property cards to the property owners. This would facilitate monetization of rural residential assets for credit and other financial services. Further, this would also pave the way for clear determination of property tax, which would accrue to the GPs leading to better civic amenities

The following stakeholders would be involved in carrying out the scheme:

i. Nodal Ministry (Ministry of Panchayati Raj), Govt of India.
ii. Survey of India (Technology Implementation Agency)
iii. State Revenue department
iv. State Panchayati Raj Department
v. Local district authorities.
vi. Property owner
vii. Gram Panchayat (GP).
viii. National Informatics Centre (NIC) – GIS Division
ix. Other line departments having assets in Rural inhabited areas (if any) for preparing comprehensive database.

For monitoring purpose, a three-layer monitoring and evaluation framework shall be put in place for timely monitoring, reporting and course corrections (wherever necessary).

1. RATIONALE FOR THE SCHEME

1.1. Introduction

The Government of India has decided to implement the Central Sector scheme "***SVAMITVA***". The scheme aims to provide an integrated property validation solution for rural India. The demarcation of abadi areas (*the abadi area includes inhabitant land, inhabited areas contiguous to Abadi and wadis/basties in rural areas*) would be done using Drone Surveying technology, with the collaborative efforts of the Ministry of Panchayati Raj, State Panchayati Raj Department, State Revenue Departments and Survey of India.

This would provide the 'record of rights' to village household owners possessing houses in inhabited rural areas in villages which, in turn, would enable them to use their property as a financial asset for taking loans and other financial benefits from Banks. Further, this would also enable updation of property and asset register to strengthen tax collection and demand assessment process of Gram Panchayats. Thus, the legal record of property holders and issuance of 'Property Cards' to household owners based thereon would facilitate monetization of rural residential assets for the purchase of credit and other financial services. This could also pave the way for clear determination of property tax, which would accrue to the GPs directly in States where it is devolved.

Apart from demarcation of individual rural property, other Gram Panchayat and community assets like village roads, ponds, canals, open spaces, school, Anganwadi, Health sub-centres, etc. would also be surveyed and GIS maps would be created. Further, these GIS maps and spatial database would also help in preparation of accurate work estimates for various works undertaken by Gram Panchayats and other Departments of State Government. These can also be used to prepare better-quality Gram Panchayat Development Plan (GPDP).

1.2. Need for the Scheme

Survey of rural land in India for Settlement and record of rights had last been completed many decades back and moreover, ABADI (inhabited) area of villages were not surveyed/ mapped in many States. Hence, in the absence of a legal document, the owner of the property in the rural areas are not able to leverage their own property as a financial asset acceptable by the banks for the purpose of providing loans and other financial assistance. Therefore, to provide the legal right of the property to the household owner, there is a need of latest Drone Technology and Continuously Operating Reference Station (CORS) technology for capturing images.

The Survey of India (SoI) prepares National Topographic database on all scales, leveraging emerging technologies for topographical mapping at various scales as per user requirements using Airborne-Photography, Satellite Imageries (Stereo/Mono), Airborne-LIDAR, High Resolution Satellite Imageries (HRSI), Unmanned Air Vehicles (UAV) or Drone platform with Optical/Infra-Red/LIDAR sensors. High resolution mapping at very large scales for revenue, urban and water resources requirements has been in forefront for the past 3-4 years and SoI has evolved standard operating procedures for acquiring very high-resolution aerial images and preparing very large-scale maps at 1:500/1,000 scale using Drones. Mapping of the Rural habitations in partnership with various state governments viz Maharashtra, Haryana, Karnataka, Madhya Pradesh etc primarily for use as revenue maps to confer ownership rights has been undertaken by SoI in the past 1-2 years. Based on these maps or data, **property cards have been issued to the citizens viz for Sonari village by govt of Maharashtra and SIRSI village by govt of Haryana.** The high resolution and `accurate image base maps have facilitated creation of the most durable record of property holdings in these areas with no legacy revenue records.

2. OBJECTIVES AND COVERAGE OF SCHEME

2.1. Objectives of the Scheme

The scheme seeks to achieve the following objectives: -

i. To bring financial stability to the citizens in rural India by enabling them to use their property as a financial asset for taking loans and other financial benefits.
ii. Creation of accurate land records for rural planning.
iii. Determination of property tax, which would accrue to the GPs directly in States where it is devolved or else, add to the State exchequer.
iv. Creation of survey infrastructure and GIS maps that can be leveraged by any department for their use.
v. To support in preparation of better-quality Gram Panchayat Development Plan (GPDP) by making use of GIS maps.
vi. To reduce property related disputes and legal cases

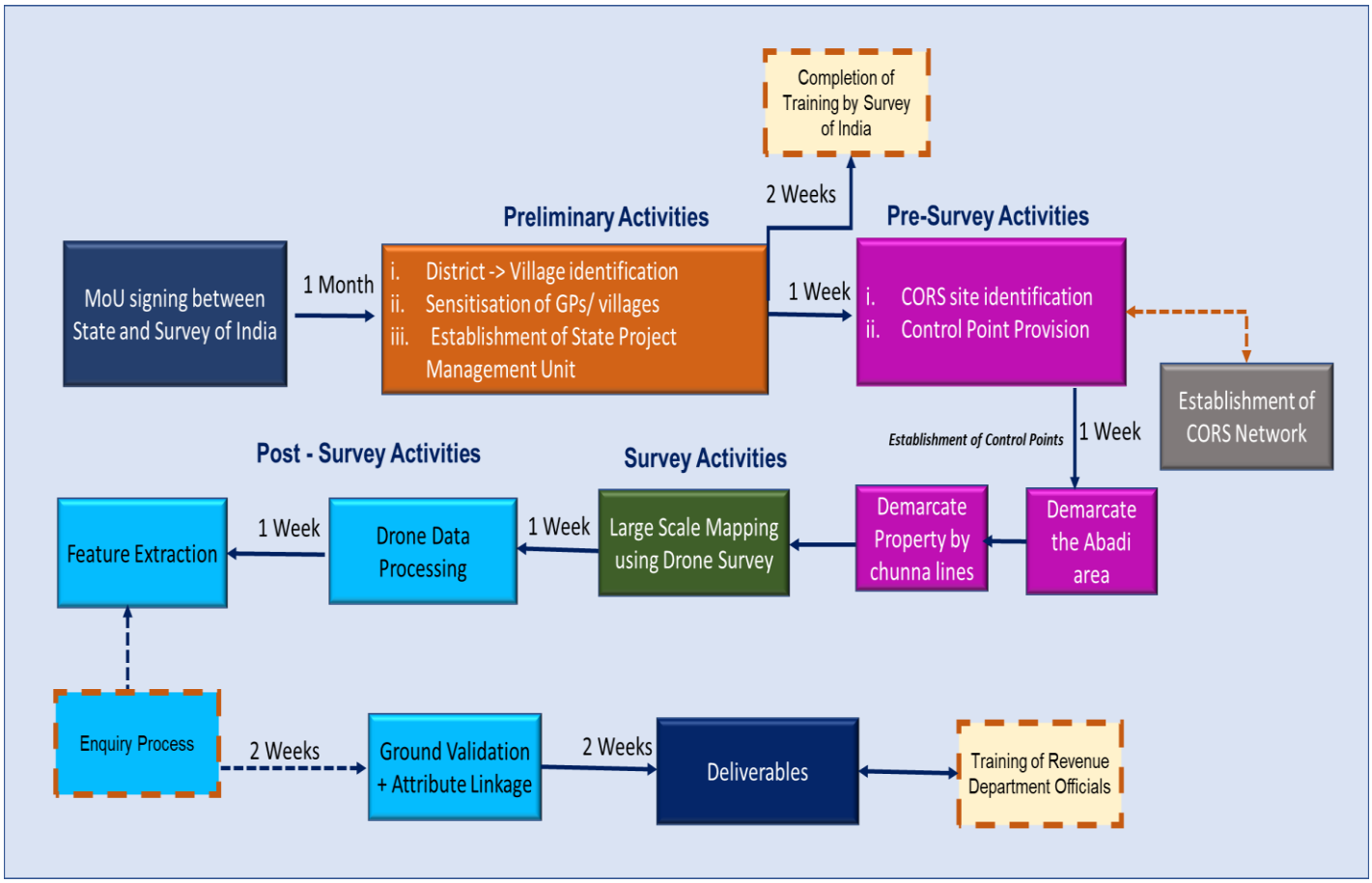
2.2. Coverage

There are about 6.62 lakh villages in the country which will be eventually covered in this scheme. The entire work is likely to be spread over a period of four years. Presently, the pilot phase is being approved for the year 2020-21. Pilot Phase will extend to six pilot States (Haryana, Karnataka, Madhya Pradesh, Maharashtra, Uttar Pradesh and Uttarakhand) covering approx. 1 lakh villages and CORS network establishment is planned for two States (Punjab And Rajasthan). Refer Annexure I for the state wise count of villages covered under pilot phase. The respective State Government would finalise the list of villages at the time of signing MoU with Survey of India

**For the States, which have already done Abadi surveys, the scope and the process of the survey will be decided in Phase II (post Pilot Phase), in consultation with the States and SoI*

2.3. Implementation Process Flow

The brief/ broad level implementation process flow of the scheme is illustrated below:



**Timelines depicted are indicative*

3. COMPONENTS OF THE SCHEME

3.1. Brief outline of the components to be taken up under the Scheme:

S. No	Scheme Component	Brief Description*
1	Establishment of CORS network	Continuously Operating Reference Stations (CORS) is a network of reference stations that provide a virtual base station that allows access long-range high-accuracy Network RTK corrections. The CORS Network supports in establishing Ground Control Points, which is an important activity for accurate Geo-referencing, ground truthing and demarcation of Lands.
2	Large Scale Mapping (LSM) using Drone	Rural inhabited (abadi) area would be mapped by Survey of India using drone Survey. It would generate high resolution and accurate maps to confer ownership property rights. Based on these maps or data, property cards would be issued to the rural household owners.
3	IEC Activities	Awareness program to sensitize the rural population about the surveying methodology and its benefits
4	Enhancement of Spatial Planning Application “Gram Manchitra”	The digital spatial data/maps created under drone survey shall be leveraged for creation of spatial analytical tools to support preparation of GPDP.
5	Online Monitoring System	Online Monitoring and reporting dashboard would monitor the progress of activities.
6	Program Management Unit i. National Programme Management Unit (NPMU) ii. State Programme Management Unit (SPMU)	The scheme will be implemented through the regular departmental mechanisms, which will be assisted by Programme Management Units at the National and State level.

**Detailed description may be viewed in Section 3.2 below*

3.2. Scheme Components details

3.2.1. Establishment of Continuous Operating Reference System (CORS) Network

Continuously Operating Reference Stations is a network of reference stations that provide a virtual base station that allows access long-range high-accuracy Network RTK corrections. The RTK networks extend the use of RTK to a larger area containing a network of reference stations. Accuracy is increased in a CORS network, because more than one station helps ensure correct positioning and guards against a false initialization of a single base station. Real-time kinematic (RTK) positioning is a satellite navigation technique used to enhance the precision of position data derived from satellite-based positioning systems. The Survey of India shall perform the establishment of CORS Network, preparation of Geoid Model and ensure operation and maintenance of CORS network stations and provision of CORS network services for 5 years. The CORS network would be available to State and Central Government department on licence basis without any charges or very nominal charges.

The main activities for Establishment of CORS network include:

i. Completion of the tendering process for outsourcing civil construction work, Installation and commissioning of CORS stations
ii. Site selection and recce for CORS stations
iii. Civil construction work by outsourced agency
iv. Installation and commissioning of CORS stations by outsourced agency
v. Establishment of Control Centre and Disaster Recovery (DR) by SoI
vi. Operation and Maintenance of CORS Network by SoI
vii. Training and Capacity building in CORS network-based uses or applications

Benefits of CORS Network

i. The CORS network supports in establishing Ground Control Points, which is an important activity for accurate Geo-referencing, ground truthing and demarcation of lands.

ii. Once the CORS network is established, it could be used by any State agency /Department viz Revenue Department, Gram Panchayat (GP), Public Works Department, Rural Development Department, Agriculture, Drainage & Canal, Education, Electricity, Water, Health etc. for the survey and implementing/using GIS based applications.
iii. This would facilitate use of CORS network for any survey related activities like road construction, Irrigation works and infrastructure works etc.
iv. CORS network established under pilot phase of the scheme will also cover the border areas of other neighbouring States. So, accurate Geo-reference could also be possible on these areas. CORS Networks for the State of Punjab and Rajasthan will be established under Pilot Phase (2020-2021). Refer *Annexure II* for the status of CORS network.
v. For the next phase of the scheme, the states and its neighbouring areas already covered through CORS networks established during pilot phase would be able to directly start with on the ground survey

3.2.2. Large Scale Mapping using Drone

Rural inhabited (Abadi) area would be mapped by Survey of India in collaboration with State Revenue Department to generate revenue maps to confer ownership property rights. Based on these maps or data, property cards would be issued to the rural household owners in Abadi area. The high resolution and accurate image base maps would facilitate creation of the most durable record of property holdings in areas with no legacy revenue records. The main activities include:

i. Acquisition of Images

   a. Procurement of Drone by SoI
   b. Permissions or Clearances for drone flying from DGCA, MoD, MHA etc

c. Demarcation of Abadi area by issuing notices to the adjacent landholders.
d. Ground marking of parcels/properties in area to be surveyed using white limestone powder (Chunna etc.)
e. Mission planning for drone flying using available maps/satellite imagery data
f. Provision of Control and Check points: -
   Establishment of Ground Control Points (GCPs) Horizontal and Vertical Control, the location, sketches, description and ids of all control points need to be maintained in GIS and co-ordinate list needs to be maintained in both system of latitude/longitude, and WGS-84 and UTM Coordinate System zone via CORS network
g. Large scale mapping of rural inhabited area (abadi) using Drone or UAV (Unmanned Aerial Vehicle) would be carried out using Professional Survey Grade UAVs as these UAVs are RTK (Real Time Kinematic) / PPK (Post Point Kinematic) enabled and use high resolution RGB sensor on 1:500 scale with image capturing of better than 5 cm GSD ± 12.5 cm or better planimetry accuracy to provide accurate projection centre and orientation of the images captured during the flying
h. Processing of data acquired through Drones, Data Processing Block Control and Adjustment -AT (Aerial Triangulation)/DEM (Digital Elevation Model) generation and DTM (Digital Terrain Model) processing and ortho-rectified images (ORI)

ii. Feature Extraction and Base Map Generation:

a. ORI shall be used for extraction of all topographical features by SoI including property boundaries marked in ground jointly by Gram Panchayat and State Revenue Department i.e. village residents and Revenue department officers. State Revenue Department and State Panchayati Raj Department will provide requisite support to the Survey of India (SoI) feature extraction team in identification of features or assets viz. open plots, govt. owned land, Gram Sabha owned properties, individual properties.

b. 2D/3D features extraction and demarcation of attributes as per requirement of State Revenue Department on the digital map
c. Incorporation of attribute information and other secondary information in the GIS database which shall be OGC (Open Geospatial Consortium) compliant.
d. Creation of DEM and generation of Land Parcel maps of 1:500 scale
e. Numbering of properties/structures within Lal dora area as per the numbering system provided by the State Revenue Department.

iii. Ground validation of ORI and digital maps by SoI for accuracy.
iv. Ground-truthing and validation of Land Parcel maps collaboratively by Survey of India and State Revenue Department
v. Post validation and verification, creation of final LPM (Land Parcel Maps), village maps /digital GIS maps and GIS database
vi. Handing over of the final deliverables (Final maps and GIS database) to State Revenue Department and to the State Rural Development/Panchayat Raj Department duly vetted by MoD. The Deliverables should include a working GIS database and application so that further updation of data and utilization of data is possible without incurring any licence charges later on.
vii. Handing over of village maps and digital GIS database to MoPR (through NIC-GIS division)
viii. Issuance of Property cards by State Authorities/ Revenue Department.
ix. Training, Capacity building for hand holding to the officials of Revenue Department by SOI.

3.2.3. Information, Education, Communication (IEC) Initiatives

National level IEC campaign will be conducted to mobilize people to participate in the drone survey. It will include running Campaign during National Panchayati Raj Day/week, dissemination of good practices and other national campaigns through various mediums including social media.

The State government shall develop comprehensive communication strategy to undertake awareness programs to sensitize the local population about the surveying methodology and its benefits. For facilitating such awareness,

communication materials can be developed in the form of manuals, flip books, poster, role plays, puppet shows, billboards, pamphlet distribution, public announcement in villages, permanent displays like Information walls, citizen information counters on fixed days can also be considered. Other activities may include:

i. Showcasing good practices, short films on the survey and innovations by Panchayats
ii. Sensitization and Mobilisation of Gram Sabha
iii. Use of social Media, audio visual media, community radio, special programmes/features in television channels
iv. Cultural activities, exhibitions, mobile vans to disseminate information about survey and its benefits
v. A core group of officers and staff from the States/UTs may be sent on exposure visits to other States/UTs which have demonstrated considerable success in implementing the project.

3.2.4. Enhancement of Spatial Planning Application "Gram Manchitra"

A spatial planning application "Gram Manchitra" has been implemented by MoPR for leveraging GIS maps/ technology for the preparation of GPDP. As the drone survey progresses, the digital spatial data/maps created under drone survey shall be leveraged for creation of spatial analytical tools to support preparation of GPDP.

3.2.5. Online Monitoring System

Online Monitoring and reporting dashboard would be centrally hosted for real time monitoring of the SVAMITVA scheme. It will Monitor progress of activities under the scheme. State Project Management Unit will ensure submission of online monitoring reports from the District Collector/Deputy Commissioner of each district.

3.2.6. Project Management

The scheme will be implemented through the regular departmental mechanisms, which will be assisted by Programme Management Units at the National and State level.

i. **National Programme Management Unit (NPMU)** will be set up at the National level for overall management, monitoring of various activities under Scheme and to provide support to States and Survey of India. The NPMU will have qualified and experienced experts from the relevant domain. MoPR may also hire short term consultants and/or will have flexibility to outsource (NPMU) to professional agencies. Refer Section 8.1.2 for the details of key activities of the NPMU.

ii. **State Programme Management Unit (SPMU)** will be set up at the State level for overall management, monitoring of various activities under Scheme and to provide support to State Revenue Department, District officials, GP functionaries and Survey of India. The SPMU will have qualified and experienced experts from the relevant domain. State Revenue Department may also hire short term consultants and/or will have flexibility to outsource (SPMU) to professional agencies. Refer Section 8.1.4 for the details of key activities of the SPMU.

4. Financial Outlay and Funding Pattern

4.1. Financial outlay for Pilot Phase and Scheme Component wise Funding Pattern

#	Scheme Components	Fund Recipient	Outlay for Pilot phase (FY 2020-21)	Instalments	Requirements
1	**Establishment of CORS network**	Survey of India	24.24 crores covering Establishment of 101 CORS networks in Punjab and Rajasthan State	**1st** (50 % of Total Estimated cost for CORS Establishment earmarked for the respective State)	Based on the MoU signed between SoI and the respective States
				2nd (Remaining 50 % of Total Estimated cost for CORS Establishment earmarked for the respective State)	Based on submission of physical progress report (Ref. Section 4.2) along with utilisation certificate/ expenditure statement of 1st instalment
2	**Large Scale Mapping (LSM) using Drone**	Survey of India	48.50 crores covering approx. 1.01 lakh villages (*Refer* State *wise list of villages at Annexure I*)	**Mobilization cost** (30% of total estimated cost for Large Scale mapping earmarked to the respective State)	Submission of Annual Proposal by SoI (Action Plan) to MoPR
				1st (30 % of total estimated cost for Large Scale mapping earmarked to the respective State)	Disbursement based on the physical progress as reported (Ref Section 4.2)
				2nd (40 % of total estimated cost for Large Scale mapping earmarked to the respective State)	Disbursement based on the physical progress as reported (Ref. Section 4.2) along with utilisation certificate/ expenditure statement of 1st instalment

3	**IEC Activities**	State Revenue Department	4 crores	**1st** (50 % of Total Estimated cost earmarked to respective States for conducting IEC activities)	Grants-in-aid on submission of demands/ estimates/ project proposals
				2nd (Remaining 50 % of Total Estimated cost earmarked to respective States for conducting IEC activities)	Based on submission of utilisation certificate/ expenditure statement
4	**Enhancement of Spatial Planning Application "Gram Manchitra"**	NIC through NICSI	1.5 Crores	**1st** (50 % of Total Estimated cost for Enhancement in Spatial Application and online Dashboard)	Annual proposal submitted by NIC (Action Plan) and tripartite MoU signed among NIC, NICSI and MoPR
5	**Online Monitoring System**	NIC through NICSI		**2nd** (Remaining 50 % of Total Estimated cost for Enhancement in Spatial Application and online Dashboard)	Based on submission of physical progress certifying utilisation certificate/ expenditure statement of 1st instalment
6	**Program Management Unit**				
6.1	National Programme Management Unit (NPMU)	NIC through NICSI	76 lakhs	**1st** (50 % for total cost estimated for NPMU)	Annual proposal submitted by NIC (Action Plan) and tripartite MoU signed with among NIC, NICSI and MoPR
				2nd (Remaining 50 % for total cost estimated for NPMU)	Based on submission of utilisation certificate/ expenditure statement

6.2	State Programme Management Unit (SPMU)	State Revenue Department	65 lakhs	**1st** (50 % of Total Estimated cost earmarked to respective States for State Programme Management Unit)	Grants-in-aid on submission of demands/ estimates/project proposals
				2nd (Remaining 50 % of Total Estimated cost earmarked to respective States for State Programme Management Unit)	Based on submission of utilisation certificate/ expenditure statement

The Financial outlay depicted above is limited to Pilot Phase of the Scheme.

All transactions related to the release and tracking of SVAMITVA Scheme funds will be done only through PFMS. All releases would be in accordance with the provisions of the GFR, 2017.

4.2. Parameters for funds disbursements

An MoU between Ministry of Panchayati Raj and Survey of India would be the basis for implementation of the Scheme

Detailed Standard Operating Procedures (SOP) would be prepared. The SOP would provide the necessary formats and other details for measuring the implementation of the scheme.

Component	Instalment	Preconditions for Release of Payment	Key Performance Indicator *
Establishment of CORS Network	1st	Signing of MoU between SoI and the respective States	
	2nd	The progress for CORS duly verified by the competent authority (SoI) and countersigned by the Chairman of State Steering Committee.	Funds would be disbursed to SoI based on progress reported on the following parameters i. No. of CORS network established, installed and Commissioned ii. No. of CORS network functional
Large Scale Mapping (LSM) using	Mobilization	Signing of MoU between SoI and the respective States	

Component	Instalment	Preconditions for Release of Payment	Key Performance Indicator *
Drone	1st	The progress of Large-Scale Mapping (LSM) using Drone duly verified by competent authority (SoI) and countersigned by the Chairman of State Steering Committee	Funds would be disbursed to SoI based on progress reported on the following parameters i. No. of villages completed drone flying ii. No. of villages data processing completed, and maps generated iii. No. of villages for which GIS database has been prepared iv. Training and capacity building of Government officials completed by Survey of India
	2nd	The progress of Large-Scale Mapping (LSM) using Drone duly verified by the competent authority (SoI) and countersigned by the Chairman of State Steering Committee	
IEC	1st	Submission of Project Proposals	Only on format of proposal submission
	2nd	Utilisation Certificate/ Expenditure Statement, duly verified by MoPR	Conduct of training and awareness camps in the area of implementation
Enhancement in Spatial Application and Development of Online Monitoring Dashboard	1st	Signing of tripartite MoU among NIC, NICSI and MoPR	Deployment of resources as per the plan, Initiation report
	2nd	Utilisation Certificate/ Expenditure Statement countersigned by DDG(NIC) and duly verified by MoPR	Successful maintenance of dashboard, development of planning analytics
Programme Management Unit			
NPMU	1st	Signing of tripartite MoU among NIC, NICSI and MoPR	Deployment of resources as per the plan, Initiation report
	2nd	Utilisation Certificate/ Expenditure Statement, countersigned by DDG(NIC) and duly verified by MoPR	Timely conduct of meetings of the National Steering Committee, issue of proceedings
SPMU	1st	Submission of Project Proposals	Deployment of personnel, orders issue
	2nd	Utilisation Certificate/ Expenditure Statement, duly verified by MoPR	Timely conduct of meetings, timely uploading on dashboard

**Indicative List*

5. SURVEY APPROACH

5.1. Survey Methodology

Drone or UAV (Unmanned Aerial Vehicle) based large scale mapping is carried out using Professional Survey Grade UAVs as these UAVs are RTK (real Time Kinematic) / PPK (Post point kinematic) enabled and use high resolution RGB sensor to provide accurate projection centre and orientation of the images captured during the flying. Terrain tracing functionality in such UAV platform ensures the consistency in the image quality and geometric accuracy. Drone based high resolution or large-scale mapping on 1:500/1000 scale requires precise spatial reference frame of the entire state to ensure the spatial data integration, matching and seamlessness with other datasets created using the common reference frame.



The subsequent sub-sections detail the various activities under the difference stages involved in the complete process of Drone based survey of Rural in-habitations.

5.1.1. Pre-Survey Activities

i. Establishment of CORS network
ii. The regional revenue office takes permission from the Collector's office to conduct the survey. The Collector notifies the survey area through a public notice.
iii. The Panchayati Raj Department invites the residents of the village for Gram Sabha to inform them about the schedule of the survey and to sensitize about the surveying methodology and its benefits.
iv. Identification of individual properties, Government assets, Gram Sabha land parcels, roads, open plots etc. and Ground marking of property areas to be surveyed.
v. SoI takes requisite permission for flying Drones from Directorate General

of Civil Aviation/ Ministry of Defence

vi. Mission planning for drone flying using available maps/satellite imagery

5.1.2. Survey Activities

i. The regional revenue office would provide scanned maps to SoI
ii. SoI should provision for Ground Control Points or Check points before flying.
iii. Acquisition of Aerial images using Professional Survey Grade Unmanned Aerial Vehicle/ Drone for Large Scale Mapping of rural abadi area, inhabited areas contiguous to Abadi and wadis/basties in rural areas.
iv. The images captured through Drone would be processed by Survey of India in its Geographic Information System lab.
v. Data Processing: Basemap Generation and 2D Feature Extraction
    a. Generation of DEM & Ortho Rectified Images
    b. Extraction of 2D topographical features from Ortho-rectified images
    c. Generation of Land Parcel maps at a scale of 1:500
    d. Linking of Attributes with extracted topographical features
    e. Creation of boundaries of villages
    f. Numbering of properties/structures within village abadi area /Lal dora area as per the numbering system provided by State Government
vi. Creation of GIS database
vii. Ground validation of the processed images for better than 10 cm accuracy.

5.1.3. Post -Survey Activities

i. Legal Notification for joint verification of ownership by State Revenue Department and Gram Panchayat.
ii. Inquiry Process for Ownership adjudication: The process is initiated, where survey officials verify ownership of the land parcels, with the help of gram sabha, land owners, and review the existing documents
iii. Issue of notification for providing adjudication of final results. The Enquiry Officer (from the Survey Department) re-verifies the ownership and

resolves any post survey objections received from property owners. These may be related to correction in owner name, property boundaries, joint holding etc. For unresolved objections / disputes, the final decision shall rest with the District Magistrate / Collector.

iv. After Ground truthing, inquiry process and dispute resolution, final Digital maps/ LPM /DEM/ GIS datasets would be generated and handed over to MoPR/Authorised agency as per the standard procedure for use.

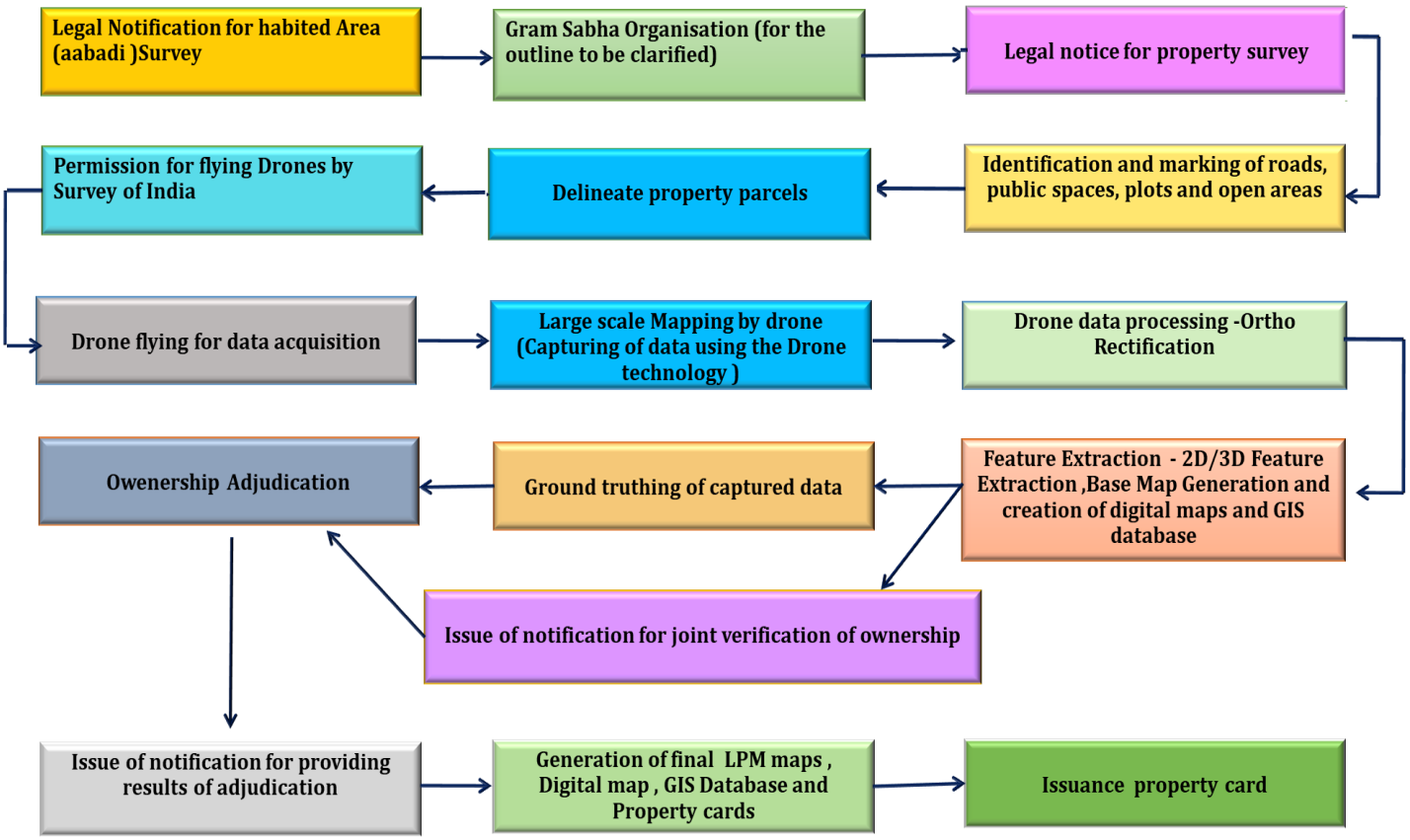
v. Printing and distribution of property cards to village household owners (legal document of property ownership).

vi. Provisions should be made for the proper storage and regular update of records,

vii. Gram Panchayat shall update the property tax and asset register of GP

viii. State Revenue shall perform and responsible for regular updation of maps.

ix. SoI shall provide training and Capacity building of Revenue Department Government Officials



6. STAKEHOLDERS – ROLE & RESPONSIBILITY

Roles and Responsibilities of different Stakeholders are illustrated as below

6.1. Ministry of Panchayati Raj

Funding and monitoring of the scheme at the Central level. Monitoring mechanism is illustrated in section 8.1 below

The funding shall be provided to the following stakeholders

i. Survey of India for Establishment of CORS network
ii. Survey of India for large scale mapping using drone
iii. State Revenue Department for State Project Management and IEC Activities
iv. NIC for Spatial analytical tools - NIC- Panchayat Informatic Centre shall consume the digital spatial data/maps created under drone survey for creation of spatial analytical tools and enhance Gram Manchitra application to support preparation of GPDP
v. NIC for Development and Maintenance of Monitoring Dashboard – NIC would develop and centrally host the application to report and monitor the progress of the scheme

6.2. Survey of India

i. The part of the Project pertaining to processing of images etc. to be implemented by Survey of India shall be executed on it's premises under it's close supervision. Workspace to the 3rd party or modernisation of available space in terms of computers/peripherals/servers/data centre shall be provided or looked after by the Survey of India.
ii. For outsourcing of any activity under the project, SoI will be responsible for preparation of RFPs/Bids, Processing of bids, Award of work, Supervision, Quality check and Work execution as per contract agreement as well as the norms laid down by Government of India.
iii. SoI shall be responsible for survey planning, execution and monitoring of survey activities and shall adhere with the norms as laid by Government of India
iv. All clearances for drone flying, data vetting and final classification will be

taken by SoI

v. Establishment of CORS (Continuously Operating Reference Stations) along with their operation and maintenance for five years.

vi. All Continuously Operating Reference Stations shall be connected with high precision/precision levelling based on Survey of India Benchmarks

vii. Acquisition of Aerial images using Professional Survey Grade Unmanned Aerial Vehicle/ Drone for Large Scale Mapping of rural Abadi area of state.

viii. Post processing of Unmanned Aerial Vehicle images shall be carried out by Survey of India (SoI) in Geographic Information System lab at SoI regional centre. The SoI shall use their hardware, software and it's GIS Lab for data processing

ix. Data processing and Feature extraction: Ortho Rectified Images, and extraction of topographical features. Please refer section 3.2.2.ii point above for details.

x. Attribute entry and linking: The attributes collected/provided by State Government shall be linked with their respective features, thereby creating a digital spatial library of all the features and their respective information. The data entry in the attributes table shall be carried out by Survey of India in coordination with SPMU.

xi. Numbering of the properties / structures within rural inhabited (Abadi)/Laldora/area as per numbering system provided by the State government.

xii. Ground-Truthing and validation of topographical features as derived from ortho- rectified images

xiii. Generation of updated Land Parcel Maps (LPM) in suitable soft copy shape (.shp) file formats, in printing formats and other Geographic Information System compatible formats which shall be linked with Compatible software. The Land Parcel Maps product shall comprise of base map overlain by different layers of topographical features, man-made structures, land parcel information, district/tehsil/village boundaries information, etc. along with alike attributes as per the requirement of Revenue department.

xiv. To implement Open Geospatial Consortium (OGC) compliant Geographic

Information System database models for generation of Geographic Information System layer data structure for storing spatial and attributable data

xv. Handing over of the final deliverables to Ministry of Panchayati Raj/State authorities duly vetted by MoD.

xvi. Training and Capacity building of nominated personnel at State Revenue Department on the operations and usage of various applications, technologies, which are to be used in the project.

6.3. State Revenue Department

i. State will carry out appropriate amendment to the Land Revenue Code and/or any other administrative document to grant the format of the Property Card due authority and validity

ii. The State Revenue Department need to check the extent of activities that can be undertaken to conduct Drone survey for demarcation of rural inhabited areas in the State Revenue Act. *If required*, State may need to seek an amendment in the State Revenue Act to undertake drone and physical survey of properties.

iii. Facilitation of field survey activities with support from local authorities for CORS site selection and establishment work and physical security of equipment and to field teams, hiring of field vehicles, hiring of local labours, accommodation for field teams etc.

iv. Each Drone/ Unmanned Aerial Vehicle flying team shall be accompanied by at least one employee from Revenue Department, Gram Panchayat and, if necessary, one official from Police Department.

v. Marking of property boundaries with Chunna lines with owners and Gram Panchayat before the drone flying in the area

vi. To facilitate feature extraction as per state requirements to SoI team

vii. Provide Attribute information for entry and linking: 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 State Government.

viii. Ground activities for checking and validation of ORI data: Ground-Truthing

and validation of Land Parcel maps and layers pertaining to feature list shall be carried out by State Government

ix. Responsible for (a) checking the accuracy of feature data/layer and (b) ensuring correctness of attributes data as supplied to Survey of India

x. Issue of notification for providing adjudication of final results. The Inquiry Officer (from the Survey Department) re-verifies the ownership and resolves any post survey objections received from property owners. These may be related to correction in owner name, property boundaries, joint holding etc. For unresolved objections / disputes, the final decision shall rest with the District Magistrate / Collector.

xi. Finalization of revenue maps and subsequent actions

xii. Co-ordinate with SoI for the training to officials/ functionaries for Issuance of Property Card to villagers.

xiii. Issuance of Property card to villagers.

xiv. State Governments would manage and maintain the data generated under the scheme viz.

a. Property data / maps, LMP maps and digital data created would be maintained by State Revenue Department.

b. Hard copies of the Maps created after Survey would be kept at

1. Gram Panchayats
2. Tehsil/Taluka Record Centre
3. District Record Centres
4. State Record Centre

c. Data Centre Infrastructure available and funded under Digital India Land Records Modernization Programme (DILRMP) scheme of Department of Land Records, Ministry of Rural Development to be utilised for hosting and storing the data created under the scheme

6.4. State Panchayati Raj Department

i. Organising the Gram Sabha to intimate the schedule of the survey and post survey validation of maps

ii. Providing support to sensitize the villagers about the project work and its

intended benefits leveraging RGSA funds

iii. Preparing and updating the Property (Tax) Register thru GPs.

6.5. Gram Panchayat

i. Aid the Panchayati Raj Department and State Revenue Department in the timely completion of the survey

ii. Generate Awareness among the residents of the village about the survey

iii. Digitize existing GP property (Tax) Registers, wherever applicable, and make available to SoI and Enquiry Officer for preparing interim map/Records.

iv. Coordination for ground level activities for conducting survey

v. Update property tax and asset register of GP

vi. Help in the resolution of the post survey objections received from property owners. These may be related to correction in owner name, property boundaries, joint holding etc. For unresolved objections / disputes, the final decision shall rest with the District Magistrate / Collector.

6.6. Property Owner

i. Cooperate with concerned authorities during the process of measurement and survey

ii. Producing necessary documents (if available) for the survey by the concerned authority.

6.7. NIC- GIS

i. Enhance the Ministry's Spatial Planning Application "Gram Manchitra" by leveraging digital spatial data/maps created under drone survey for creation of spatial analytical tools to support preparation of Gram Panchayat Development Plan (GPDP).

ii. Development and maintenance of centrally hosted online monitoring and reporting Dashboard of the Scheme.

iii. Store (*if required*) and Host the DEM and GIS database created under SVAMITVA Scheme.

6.8. State Department of Land Records

i. To enable use of the Data Centre Infrastructure available at different levels (State/ District/Tehsil) and funded under Digital India Land Records Modernization Programme (DILRMP) scheme of Department of Land Records, Ministry of Rural Development for hosting and storing the digital data created under the scheme.

6.9. Joint Responsibility (State and Survey of India)

i. A Memorandum of Understanding (MoU) would be signed between Survey of India and State Government for execution of this project. The States which have an existing MoU with Survey of India, wherein the mutual obligations are largely similar need not sign the new MoU.

ii. Part of activities, relating to Ground Control Points have to be completed by the State Government and Survey of India (also having its own Ground Control Point library). If required, densification shall be done using Ground Control Point library from both departments by Survey of India.

iii. Reconciliation of the survey data with the available records and finalizing the dimensions of each land parcel

7. ACTIVITIES MAPPING

The following provides the list of activities envisaged for the implementation of the scheme and the corresponding Stakeholders

7.1. List of Activities/ Deliverables- Stakeholders Mapping

T0 is the day of the launch of the Scheme.

S.No	Activities	Responsibility	Timelines (Pilot Phase) *	Remarks (if any)
1	Launch of Drone SVAMITVA Scheme	**Ministry of Panchayati Raj**	T0	
2	Establishment of Monitoring & Evaluation Framework		T0 +2 months	
2.1	National Level I. National Steering Committee II. National Programme Management Unit III. Monitoring & Reporting Dashboard	**Ministry of Panchayati Raj**	T0 + 2 Months	
2.2	State Level I. State Steering Committee II. State Programme Management Unit District Level I. District Monitoring and Review Committee	**State Revenue Department**	T0 + 2 Months	
2.3	Development of centrally hosted Online Monitoring and Reporting Dashboard	**NIC-GIS**	T0 + 2 Months	

S.No	Activities	Responsibility	Timelines (Pilot Phase) *	Remarks (if any)
3.	Signing of MoU between State Government and Survey of India	**State Revenue Department** **Survey of India**	T1 =T0 + 1 Month	
4	Identify and prepare cluster of Village for Mission Mode Drone Survey	**State Revenue Department** **Survey of India**	T1	
5	Establishment of CORS network		T1 + 10 Months	*Parallel activities with Large Scale Mapping using Drones. In States for which CORS network already established/ or not required. They Can start with Drone Survey*
5.1	Tendering for outsourcing CORS network construction and installation	**Survey of India**	T1 + 2 Months	
5.2	Site selection and recce for CORS stations: SOI selects the suitable site with the help of State Government. The State Revenue Department would facilitate required permission from owner for creation or establishment of CORS network with physical security of stations.	**State Revenue Department** **Survey of India**	T1+ 1 Month	

S.No	Activities	Responsibility	Timelines (Pilot Phase) *	Remarks (if any)
5.3	Facilitation of field survey activities with support from local authorities for safety/security of field teams & equipment, hiring of field vehicles, hiring of local labours, accommodation for field teams etc.	**State Revenue Department**	T1 + 10 Months	
5.4	Construction, installation and Commissioning of CORS station by outsourced agency	**Survey of India**	T1 + 9 Months	*To be outsourced by SoI through tendering process*
5.5	Establishment of Control Centres.	**Survey of India**	T1+ 10 Months	
5.6	Operation and Maintenance of CORS Network	**Survey of India**	T1 + 5 Years	
6	Large Scale Mapping Using Drone		T1 + 10 Months	
6.1	Procurement of Drone	**Survey of India**	T1 + 2 Months	*Cost covered in Drone flying and data acquisition*
6.2	Pre- Survey Activities			
6.2.1	Obtaining Permissions or Clearances for drone flying from DGCA, MoD, MHA etc	**Survey of India**	T1 + 1 Month	
6.2.2	Scanning the available rural habited maps and providing to Survey of India	**State Revenue Department**	T1 + 7 Months	
6.2.3	Legal Notification of Abadi area survey	**State Revenue Department**	T1 + 7 Months	

S.No	Activities	Responsibility	Timelines (Pilot Phase) *	Remarks (if any)
6.2.4	Organise the Gram Sabha to intimate the schedule of the survey	**State Panchayati Raj Department**	T1 + 8 Months	
6.2.5	Provide support to sensitize the villagers about the project work and its intended benefits leveraging RGSA funds	**State Panchayati Raj Department**	T1 + 8 Months	
6.2.6	Marking of property boundaries with Chunna lines with owners before the drone flying in the area	**State Revenue Department** **Gram Panchayat**	T1 + 8 Months	
6.2.7	Mission planning for drone flying using available maps/satellite imagery data	**Survey of India**	T1 + 9 Months	
6.3	Survey Activities		T1 + 10 Months	
6.3.1	Provisioning of Ground Control Points for flying	**Survey of India**	T1 + 8 Months	
6.3.2	Acquisition of Aerial images using Professional Survey Grade Unmanned Aerial Vehicle/ Drone for Large Scale Mapping	**Survey of India**	T1 + 9 Months	
6.3.3	Drone data processing and Feature extraction: Ortho Rectified Images, and extraction of topographical features	**Survey of India**	T1 + 9 Months	*Data is processed in Geographic Information System lab at SoI regional centre. The SoI shall use their*

S.No	Activities	Responsibility	Timelines (Pilot Phase) *	Remarks (if any)
				hardware and software and their GIS Lab for data Processing
6.3.4	Attribute entry and linking: The attributes collected/ provided (by State Government) shall be linked with their respective features, thereby creating a digital spatial library of all the features and their respective information. The data entry in the attributes table shall be carried out by Survey of India in coordination with SPMU.	**State Revenue Department** **Survey of India**	T1 + 9 Months	
6.3.5	Numbering of properties / structures within rural inhabited (abaadi)/Lal dora/area as per numbering system provided by the State government.	**State Revenue Department** **Survey of India**	T1 + 9 Months	
6.3.6	Ground-Truthing and validation of topographical features as derived from ortho- rectified images	**Survey of India** **Gram Panchayats**	T1 + 10 Months	
6.3.7	Ground-Truthing, validation of Land Parcel maps	**State Revenue Department** **Survey of India**	T1 + 10 Months	

S.No	Activities	Responsibility	Timelines (Pilot Phase) *	Remarks (if any)
6.4	Post – Survey Activities		T1 + 10 Months	
6.4.1	Issue of notification of Joint verification of ownership	**State Revenue Department**	T1 + 10 Months	
6.4.2	Property ownership Adjudication	**State Revenue Department**	T1 + 10 Months	
6.4.3	Issue of notification for providing results of adjudication	**State Revenue Department**	T1 + 10 Months	
6.4.4	Inquiry Officer with the help of Gram Panchayat Resolve post survey objections received from property owners. These may be related to correction in owner name, property boundaries, joint holding etc. For unresolved objections / disputes, the final decision shall rest with the District Magistrate / Collector	**State Revenue Department** **Gram Panchayat**	T1 + 10 Months	
6.4.5	Post Objection - Finalisation/ correction and validation of maps	**State Revenue Department** **Survey of India**	T1 + 10 Months	
7	Final Deliverables	**Survey of India**	T1 + 10 Months	
7.1	Ortho-Rectified Image (ORI)	**Survey of India**	T1 + 10	***Data Owner*** *:*

S.No	Activities	Responsibility	Timelines (Pilot Phase) *	Remarks (if any)
	of better than ± 5 cm GSD		Months	*Jointly owned by: Survey of India, Ministry of Panchayati Raj, State Revenue Department and DoLR* ***Data Storage**: Stored at Data Centre Infrastructure available and funded under Digital India Land Records Modernization Programme (DILRMP) scheme of Department of Land Records, Ministry of Rural Development*
7.2	GIS data base prepared on 1:500 scale on UTM projection and WGS-84 datum	**Survey of India**	T1 + 10 Months	***Data Owner**: Jointly owned by: Survey of India, Ministry of Panchayati Raj, State Revenue Department* ***Data Storage**: SoI servers / data center*
7.3	DEM/DSM of better than ± 20 cm accuracy	**Survey of India**	T1 + 10 Months	***Data Owner**: Jointly owned by: Survey of*

S.No	Activities	Responsibility	Timelines (Pilot Phase) *	Remarks (if any)
				India, Ministry of Panchayati Raj, State Revenue Department ***Data Storage**: SoI servers / data centre*
7.4	Property Card data (Record of Rights)	**Survey of India**	T1 + 10 Months	***Data Owner**: State Revenue Department* ***Date Storage**: NDC/ Cloud*
7.5	Hard copy maps on 1:500 scale (04 No's each) for a village on good quality 90 GSM paper along-with pdf copy	**Survey of India**	T1 + 10 Months	***Data Owner**: State Revenue Department* ***Stored at**:* *i. Gram Panchayats* *ii. Tehsil Record Centre* *iii. District Record Centres* *iv. State Record Centre*
8	Enhancement in " Gram Manchitra" Application – Development of Analytic tools leveraging GIS database prepared	**NIC-GIS**	T1 + 10 Months	
9	Updation of property tax and asset register of Gram Panchayat	**Gram Panchayat**	T1 + 10 Months	
10	Issuance of property cards to Property Owner	**State Revenue Department**	T1 + 10 Months	

S.No	Activities	Responsibility	Timelines (Pilot Phase) *	Remarks (if any)
11	Training and Capacity building to nominated officials at State Revenue Department	**Survey of India**	Phase 1 – T1+ 7 months Phase II – T1+ 9 Months	
12	Regular updation of maps.	**State Revenue Department**	*To be decided by State Government*	

*Timelines depicted are indicative. Survey related activities timelines are provided by SoI (Refer Annexure VI

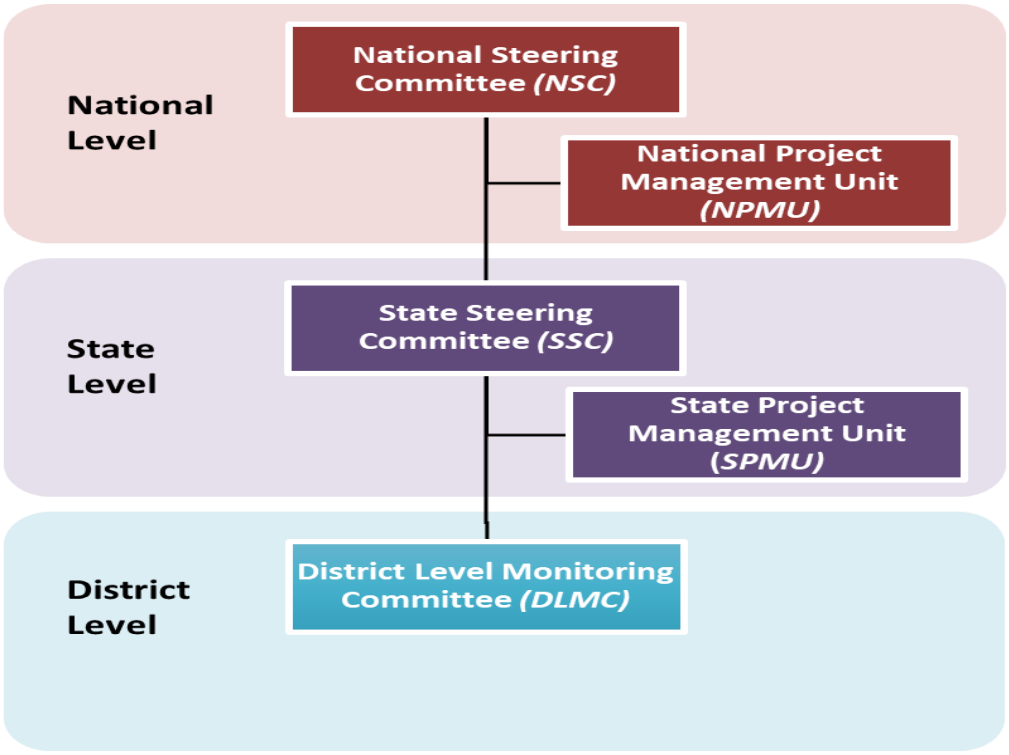
8. MONITORING AND EVALUATION

A three-layer monitoring and evaluation framework shall be put in place for timely monitoring, reporting and course corrections (wherever necessary).

It shall operate at National level, State level and District level and shall comprise of relevant decision makers and subject matter experts.

8.1. Institutional Mechanisms for Implementation, Monitoring and Management

The following three-layer Institutional Mechanisms are envisaged



8.1.1. National Steering Committee (NSC)

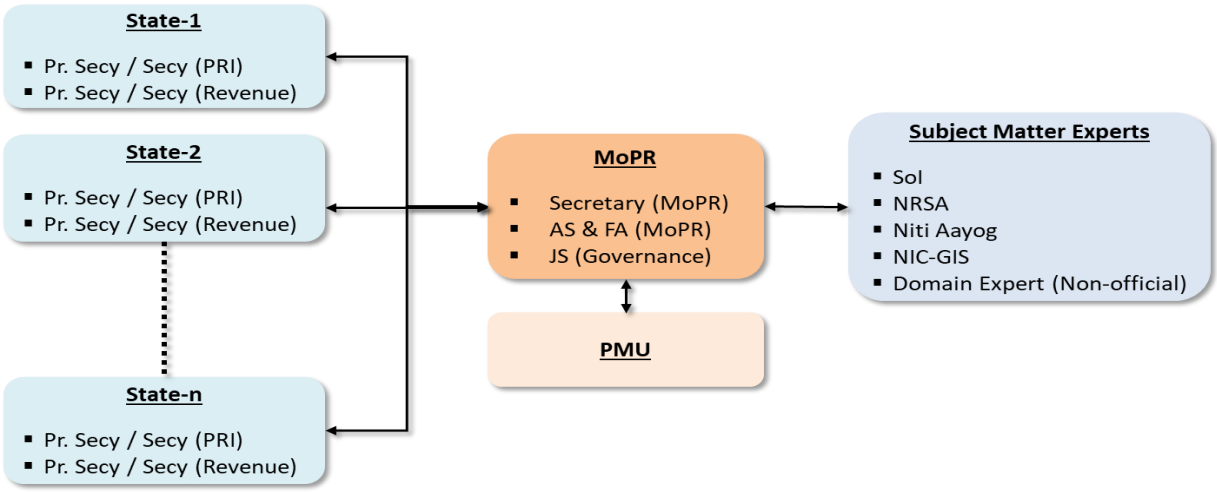
National Steering Committee (NSC) will be responsible for the overall program oversight, monitoring and guidance for the smooth operation of the scheme. The Committee would review progress, approve projects and Annual Action Plans of States and initiate suitable timely advisory/instructions to the States and SoI.

The NSC will be responsible for the following functions:

i. Provide strategic direction and guidance to the engagement.
ii. Decide on policy level issues that need to be addressed from time to time
iii. Act as the final authority for approving all the engagement deliverables

The Committee would meet at least once every quarter to monitor the scheme.

Secretary, Ministry of Panchayati Raj	Chairman
Representatives of NITI Aayog, not below the level of Joint Secretary	Member
AS and FA, Ministry of Panchayati Raj	Member
Representative of Survey of India, not below the level of Director	Member
Principal Secretary/ Secretary (Panchayati Raj Department (States selected for Pilot Phase)	Member
Principal Secretary/ Secretary (Revenue Department (States selected for Pilot Phase)	Member
Representative of Secretary, Department of Rural Development	Member
Representative of the Secretary, Department of Land Resources	Member
Representative of National Remote Sensing Agency	Member
Representative of NIC-GIS	Member
Non-official person having experience in domain	Member
Joint Secretary handling SVAMITVA Scheme, Ministry of Panchayati Raj	Member Secretary



8.1.2. National Programme Management Unit (NPMU)

NPMU will be set up at the National level for overall management, monitoring of various activities under Scheme and to provide professional and technical support to States and Survey of India.

It shall work under the supervision of Member-Secretary of the NSC i.e. JS responsible for the Scheme and shall report to him/her.

It will have qualified and experienced experts from relevant/GIS disciplines. MoPR may also hire short term consultants and/or will have the flexibility to outsource (NPMU) to professional agencies including NICSI. *Term of Reference for the NPMU Consultant is enclosed at* ***Annexure IV***.

Key National level activities will include:

i. Overall implementation and stakeholder coordination including facilitating awareness and handholding support
ii. Assistance to States and Survey of India viz. supporting with signing of MoUs, fund disbursement to States, monitoring of project timelines etc.
iii. Collaboration with Survey of India and States to monitor the establishment of CORS network and large-scale mapping using Drone.
iv. Provide functional inputs towards development and maintenance of online monitoring and reporting Dashboard of the Scheme
v. Evaluation of the effectiveness of the scheme through verification and validating of project progress
vi. Cross State sharing and learning, documentation of good practices
vii. Co-ordinate the IEC activities at the national level to mobilize people to participate in drone survey. It will include running Campaign during National Panchayati Raj Day/week, dissemination of good practices and other national campaigns through various mediums including social media
viii. Coordination with NIC-GIS division and NRSC Bhuvan for leveraging digital spatial data/maps created under drone survey to develop spatial analytical tools to support preparation of GPDP in Gram Manchitra application among other applications.

8.1.3. State Steering Committee (SSC)

The SSC shall be responsible for overall program oversight and monitoring and shall provide guidance for the smooth operation of the scheme in the respective state.

The SSC will be responsible for the following functions:

i. Provide operational guidance on the project
ii. Participate in all meetings and periodically review the progress of the project.
iii. Responsible for vetting the deliverables and recommending acceptance of deliverables to the National Steering Committee.

The Committee would meet at least once every month to monitor progress and approve dashboard updating by the SPMU personnel.

ACS (Revenue)	Chairperson
Divisional Commissioners	Member
Inspector General of Registration	Member
Commissioner/Director of Survey and Settlement and of Land Records	Member
Representative from State Panchayati Raj Department, not below the rank of Director	Member
Representative from Survey of India	Member
Official from Ministry of Panchayati Raj not below the rank of Under Secretary	Member
State Informatics Officer, NIC	Member
officer appointed by the Chairperson	Member Secretary

**State may co-opt additional four members from the State Government*

8.1.4. State Programme Management Unit (SPMU)

State Programme Management Unit (SPMU) will be set up at the State level for overall management, monitoring of various activities under Scheme and to

support State Revenue Department, District officials, GP functionaries and Survey of India.

It shall work under the supervision of Member-Secretary of the SSC and shall report to him.

It will have qualified and experienced experts from relevant/GIS disciplines. State Revenue Department may also hire short term consultants and/or will have flexibility to outsource (SPMU) to professional agencies. Tentative *Terms of Reference for the Consultants is placed at* ***Annexure IV****.*

Key State level activities will include:

i. Responsible for managing the day to day programme management activities.
ii. Keep track of project progress and keep the senior management and other important stakeholders informed about the project progress.
iii. Providing handholding support to concerned stakeholders such as State departments and Survey of India.
iv. Support State Revenue department in reporting and monitoring the progress of Large-Scale mapping using Drones
v. Consolidate the attribute information and other secondary information to be incorporated in the GIS database
vi. Support the ground-truthing of maps
vii. Facilitate signing of MoU between State and Survey of India and monitor the implementation timelines
viii. Facilitate Project progress reporting through regular updates in the Monitoring Dashboard of Scheme

8.1.5. District Monitoring and Review Committee (DMRC)

At the district level, the Committee will review the progress of implementation of the Programme at least once a month, and the District Collector/Deputy Commissioner shall submit report to the State Steering Committee. Also, the committee would be responsible for monitoring and oversight of the IEC funds granted.

District Collector / Deputy Commissioner / District Magistrate	Chairman
ADM and SDMs dealing with land revenue matters	Member
CEO/Executive Officer of the Zilla Parishad	Member
Sub-district Registrar	Member
Survey and Settlement/ Consolidation Officer having jurisdiction over the district	Member Secretary
District Panchayati Raj Officer	Member
District Informatics Officer NIC	Member
Representative from Survey of India	Special invitees

8.2. Online Monitoring Dashboard

The progress of the SVAMITVA Scheme would be regularly tracked through the online dashboard developed for this purpose.

Component	Key Performance Indicator (Outcome Measurement) *
Establishment of CORS Network	i) No. of CORS network established, installed and Commissioned
	ii) No. of CORS network functional
	iii) Training and Capacity building on CORS network-based uses or applications completed in States/UTs
Large Scale Mapping (LSM) using Drone	i) Completion status of establishment of Ground Control Points
	ii) No. of villages completed drone flying
	iii) No. of villages completed data processing and maps generated
	iv) No. of villages ground-truthing of maps completed
	v) No. of Villages with Spatial and non-spatial data dictionary with feature codes, feature type (line, points and polygon), Feature description and symbols created.
	vi) No. of villages for which DEM of ≤ 20 cm vertical accuracy for the village habited area created.
	vii) No. of villages for which the interim maps have been generated
	viii) No. of villages where Inquiry process is in process

	ix) No. of villages for which final maps have been generated
	x) No. of villages for which GIS database has been prepared
	xi) No. of villages for which Property cards have been prepared and distributed
	xii) Training and capacity building of Government officials completed by Survey of India
Programme Management	i) Programme Management Units which are functional and providing support for implementation of Scheme
IEC Activities	i) Intensive IEC conducted through various mediums ii) No. Gram Sabha sensitized and mobilised iii) No. of good practices documented and disseminated iv) No. of short films made and disseminated
Spatial Application	i) No. of villages for which GIS data has been created and shared with NIC team by SoI ii) No. of Villages for which GIS data integrated with Spatial Application iii) DEM alleviation profile created

**Indicative List*

9. DELIVERABLES

9.1. List of Deliverables

An indicative list of deliverables envisaged over the entire course of the project is given below:

i. CORS Network RTK service of ≤ 5 cm horizontal accuracy for five (05) years.

ii. Accurate geo-referenced digital maps using established control survey network based on National Spatial reference framework of the country.

iii. Geodetic network with co-ordinates and sketches of the control points showing their description and location. GCP (Ground Control Points) — the location and ids of all the control points need to be maintained in GIS (Geographical Information System) form and the coordinated list needs to be maintained in both system of latitude/longitude and WGS 84 (World Geodetic System 1984) and UTM (Universal Transverse Mercator) Coordinate System zone) via CORS (Continuous Operating Reference System) network.

iv. Metadata of features. Raw data of the ground survey work.

v. Proper indexed map with proper sheet number on the following scales:
   a. Vertical Accuracy 0.2 m for all areas (Rural abadi area/lal dora)
   b. Village Lal Dora/Abaadi on 1:500 (Ortho Rectified Images at 5 cm GSD (Ground Sampling Distance); ± 5 cm Horizontal accuracy

vi. Mosaic map of Village. Spatial and non-spatial data dictionary with feature codes, feature type (line, points and polygon). Feature description and symbols.

vii. GIS data base prepared on 1:500 scale on UTM projection and WGS-84 datum.

viii. DEM of ≤ 20 cm vertical accuracy for the village habited area.

ix. Hard copy maps on 1:500 scale (04 No's each) for a village on good quality 90 GSM paper along-with pdf copy for future printing purposes.

x. Property Cards duly printed under the guidance of the State Govt.

xi. Training courses for technical staff of at various levels in IISM, Hyderabad.

9.2. Ownership of Data

The orthorectified Base maps shall be jointly owned by the Survey of India, Ministry of Panchayati Raj and State Government. All processed data products and final data products will be jointly owned by the Survey of India, Government of India and State Government. All the agencies (Survey of India, Ministry of Panchayati Raj through NIC-GIS division and State Government) shall have the rights to use the data generated under this project for their internal applications

S No	Data Generated	Data Owner	Data Stored at	Format of data	Mechanism of data sharing
1	Ortho-Rectified Image (ORI) of better than ± 5 cm GSD	Jointly owned by SoI, DoLR (GoI), MoPR ((GoI) and State Govt	Data Centre Infrastructure available and funded under Digital India Land Records Modernization Programme (DILRMP) scheme of Department of Land Records, Ministry of Rural Development	Geo-Tiff format	SFTP web services
2	GIS data base* prepared on 1:500 scale on UTM projection and WGS-84 datum	Jointly owned by SoI, MoPR (GoI), and State Govt	NDC/Cloud	Shapefiles/ RDBMS	SFTP web services
3	DEM/DSM of better than ± 20 cm accuracy	Jointly owned by SoI, MoPR (GoI), and State Govt	SoI servers / data center	Geo-Tiff format	SFTP web services
4	Property Card data (Record of Rights)	Revenue Department of respective State Govt	State data centre	NA	To be decided by respective State IT team / State NIC unit

S No	Data Generated	Data Owner	Data Stored at	Format of data	Mechanism of data sharing
5	Hard copy maps on 1:500 scale (04 No's each) for a village on good quality 90 GSM paper along-with pdf copy	Revenue Department of respective State Govt	i. Gram Panchayats ii. Tehsil Record Centre iii. District Record Centres iv. State Record Centre	PDF	Hard Copies/CDs

*** GIS Database**

i. GIS Data would be jointly owned as mentioned above, except the Property related data

ii. The data related to Property details would be owned by State Revenue Department as it has the authority to mutate the Right of Records (RoRs) and update the maps. Hence, State Revenue Department will be the owner/host this data and others will have a right to view

iii. Other updated GIS data layer would be shared by The Talathi/Patwari level officer once every year incorporating updations that have been done in the preceding 12 months.

9.3. Year -Wise Coverage

The overall project timeline covering around 6.62 lakh villages under the SVAMITVA Scheme is estimated to be for 4 years from FY 2020-21 to FY 2023-24 with the pilot phase of 1 year from FY 2020-21. An *indicative* coverage is given below:

S No.	State/UT	Villages	No of Villages proposed to be mapped			
			2020-21	2021-22	2022-23	2023-24
1	Jammu & Kashmir	6850	0	0	0	6850
2	Ladakh	243	0	0	0	243
3	Andaman & Nicobar	552	0	552	0	0
4	Andhra Pradesh	17950	0	4000	8400	5550
5	Arunachal Pradesh	5577	0	0	0	5577
6	Assam	28680	0	0	20000	8680
7	Bihar	45265	0	22000	14000	9265

S No.	State/UT	Villages	No of Villages proposed to be mapped			
			2020-21	2021-22	2022-23	2023-24
8	Chandigarh	0	0	0	0	0
9	Chhattisgarh	20578	0	578	4000	16000
10	Dadra & Nagar Haveli	70	0	70	0	0
11	Daman & Diu	31	0	31	0	0
12	Delhi	222	0	0	222	0
13	Goa	410	0	0	410	0
14	Gujarat	19015	0	14000	5014	0
15	Haryana	7652	3826	3826	0	0
16	Himachal Pradesh	20961	0	0	8000	12961
17	Jharkhand	32725	0	725	12000	20000
18	Karnataka	33157	16580	11157	5420	0
19	Kerala	1664	0	1200	464	0
20	Lakshadweep	27	0	0	27	0
21	Madhya Pradesh	55100	1000	27050	27050	0
22	Maharashtra	44137	22069	22069	0	0
23	Manipur	3798	0	0	0	3798
24	Meghalaya	6846	0	0	0	6846
25	Mizoram	838	0	0	0	838
26	Nagaland	1617	0	0	0	1617
27	Odisha	52141	0	0	52141	0
28	Puducherry	125	0	125	0	0
29	Punjab	13045	0	0	8000	5045
30	Rajasthan	46543	0	32000	14543	0
31	Sikkim	454	0	454	0	0
32	Tamil Nadu	18463	0	9200	8000	1263
33	Telangana	11234	0	0	0	11234
34	Tripura	898	0	0	0	898
35	Uttar Pradesh	107242	53622	53622	0	0
36	Uttarakhand	17048	4000	13048	0	0
37	West Bengal	41002	0	32000	8000	1002
Total			**101097**	**247707**	**195691**	**117667**

10. IT INFRASTRUCTURE, HARDWARE AND SOFTWARE

IT infrastructure, Hardware and Software need for data processing, storing and hosting is illustrated below. ***This component is not funded under the scheme***

10.1. Post Survey Data Processing at SoI Lab:

The necessary Hardware such as Servers, Desktops, Plotters, Printers and Software required for processing of data acquired through Drones, carrying out digitization activity, feature extraction etc. will be procured, installed and operated by SoI. Apart from data processing software, SoI will make use of existing software / develop software to generate:

i. GIS ready LPM including base map overlaid by different layers of topographical features, man-made structures, land parcel information, boundaries information, etc. along with linked attribute as per the requirement of respective State Revenue Department
ii. Integration of Spatial and Textual data: Occupant data from the available records, including Gram Panchayat records, shall be integrated with LPMs generated.

10.2. Infrastructure need from State Government

State Governments would manage and maintain the data generated.

i. During project execution: SoI will be making use of all the infrastructure at SoI Lab and will deliver the intermediate Maps and final uct / data. If department wish to do QC on digital data at Taluka level, a software VPN can be established to transfer data from SOI lab to Taluka offices.
ii. Storing Hard Copies of data

Hard copies of the Maps created after Survey would be kept at

a. Gram Panchayats
b. Tehsil Record Centre
c. District Record Centres
d. State Record Centre

i. **Storing and Hosting of Digital Data**

a. For hosting and storing the data created under the scheme, the Data Centre Infrastructure available and funded under Digital India Land Records Modernization Programme (DILRMP) scheme of Department of Land Records, Ministry of Rural Development would be utilised.

b. Develop a new software or Upgrade ***Bhunaksha*** for hosting and further updating and maintenance of spatial data.

10.3. Infrastructure need from SoI

The SOI would store and host the GIS database and DEM created by post processing of data captured through Drone survey. The SoI would share this data with State Government, Ministry of Panchayati Raj through NIC as per mutually agreed mechanism for data sharing.

11. COST NORMS

Scheme Component-wise Cost Norms are illustrated as below: -

11.1. Establishment of CORS Network

Sl .No.	Sub-Activities	Cost (in Rs.) *
1	Civil construction work a. Concrete Platform b. Security Fencing	120 Crores
2.	Installation commissioning of CORS stations a. CORS Network Receivers b. Other IT Hardware c. Power back-up d. Hardware Warranty for 05 years e. Operation and Maintenance for 05 years	

**Estimated Cost for CORS Network establishment is based on the tendering processes carried out for establishment of CORS Network in State of Karnataka; State of Maharashtra and State of Uttar Pradesh as per Govt procurement guidelines and GFR terms.*

NOTE:

Actual cost would be based on the outcome of the fresh tendering process proposed to be carried out for Establishment of the CORS Network for areas proposed under this project.

Per network cost = Rs. 120 cr/ 505 = approx. Rs. 24 lakhs

11.2. Large Scale Mapping using Drone

Sl No.	Sub-Activities	Cost (Rs per village) *
1	Provisioning of GCPs for flying by SoI	Rs 600
2	Drone flying for data acquisition	Rs.2500
3	Drone data processing: Generation of ORI) and DEM	Rs.400
4	Feature Extraction, Attribute entry and	Rs.1100

Sl No.	Sub-Activities	Cost (Rs per village) *
	linking	
5.	Preparation of Final Maps/data; Printing of village and LPM maps	Rs.200
	TOTAL	**Rs. 4800 per Village**

* *Operational expenses towards field activities at Sl 1, 2 and 4 by SoI personnel including hiring of local labours, hiring/procuring the field vehicles and other petty contingent expenses related to field works and capital expenses towards instruments, hardware, software and equipment for use in project for mapping activities in office as well as field. Feature extraction work can be outsourced (as per GFR terms) in case of shortage of trained SoI digitizers/surveyors.*

NOTE:

i. *SoI has not charged salaries for its staff to be deployed in the project work in the estimated/final cost.*
ii. *Out of pocket expenses required for execution of field activities viz travelling, lodging, boarding, food expenses, communication, hiring of vehicles, hiring of local labour, Fuel- lubricants etc only shall be charged.*
iii. *Out of pocket expenses are towards field survey activities i.e.*
    a. *TA and DR expenses of SoI field surveyors,*
    b. *Boarding and lodging expenses in field of SoI field surveyors,*
    c. *Hiring field vehicles (including fuel and lubricants) and local labour or survey khalasi for survey activities,*
iv. *Miscellaneous goods items for procurement are Hard-disks, computers, drone data processing software licenses, Entry level workstations, NAS boxes etc.*
v. *Maintenance of SoI owned goods covers routine repairs/calibration/ breakdown repairs of SoI owned instruments, equipment being used in the Project activities viz GNSS Base Receivers, GNSS Rovers, Total Station, Levelling Instruments, Relative gravimeter, Rugged Field data collector, Mobile workstations, Entry/Mid-Level workstations etc.*
vi. *SoI will not charge cost towards control centre components and its DR centre components under the project.*

vii. *SoI will bear or will not charge cost towards Geoid Model development sub-activity.*

viii. *No additional cost for QA (Quality Assurance)/QC (Quality Control) work has been charged by SoI in the estimated cost.*

ix. *GIS software cost has not been charged by SoI in the estimated cost.*

x. *No additional cost towards Capacity Building or training of State Govt officers/staff viz Tuition fee, guest faculty fee has been charged by SoI in the total project cost.*

11.3. Programme Management Unit

i. National Programme Management Unit *

Total No. of Consultants	No. of Consultants for Pilot Phase for 1st Year	Rate per month including OPE (in Rs.)
5	2	3.8 lakhs

ii. State Programme Management Unit *

Total No. of Consultants	No. of Consultants for Pilot Phase for 1st Year	Rate per month including OPE
60	10	Rs. 65,000

##	STATES/ UTs (Pilot Phase)	No. of SPMU Consultants
1	Haryana	2
2	Karnataka	2
3	Madhya Pradesh	1
4	Maharashtra	2
5	Uttar Pradesh	2
6	Uttarakhand	1

***** *Programme Management Unit would be functional from 01 June 2020 (taking two months buffer for hiring process)*

11.4. IEC Activities

Pilot Phase

i. Total Villages: 1,01,097

ii. IEC Budget: Rs. 4 Crores

iii. Per village cost*: Rs. 395

***IEC Budget would be disbursed at District level (Consolidating the villages in the district) and **District-level Monitoring and Review Committee** would oversight/ monitor the IEC budget*

Note: Any shortfall may be supplemented from IEC component of RGSA scheme

11.5. Enhancement in Spatial planning Application and development of online Monitoring System

Activities	1st Year
i. Leveraging digital spatial data/maps created under drone survey for creation of spatial analytical tools to support preparation of GPDP. ii. Development and maintenance of online monitoring and reporting Dashboard of the Scheme	1.5 Crores

12. FUTURE UPDATION OF PROPERTY DATA AND MAPS

The State Government shall be responsible for any future updation of rural abadi property data and conducting surveys on regular basis.

The mechanism for future updation of Property data and maps of a State shall be decided by the State Government.

12.1. Property data updation

The updation of property related data would be done as a part of regular data maintenance and the update policy defined as per rules and regulation of State Revenue Department. It is the responsibility of State Revenue Department officials to update the Property Data.

12.2. Map data updation

Survey of India would provide training to the State Revenue Department officials on the operations and usage of various applications and technologies for map data updation (e.g. data updation, use of CORS Network Rover connected FDC), which are to be used in the project. The state line departments will build in-house capacity to handle the project.

12.3. Future updation

Once the GIS database is prepared encompassing the 6.62 lakh villages, the State Governments would be responsible for conducting future surveys and updating the GIS database. The update frequency of re-survey would be decided by State Government.

13. TECHNICAL GUIDELINES

13.1. Standardisation of GIS Database

The following main data layers shall be generated under the survey

i. Cadastral
ii. Transportation
iii. Hypsography or Terrain
iv. Hydrology
v. Habitation
vi. Drainage
vii. Land Use or land Cover (LU/LC)
viii. Point of Interest

13.2. Symbology

Symbology shall be defined as per standard SoI symbology and Meta-data as BIS standard shall be prepared for GIS database.

Annexures

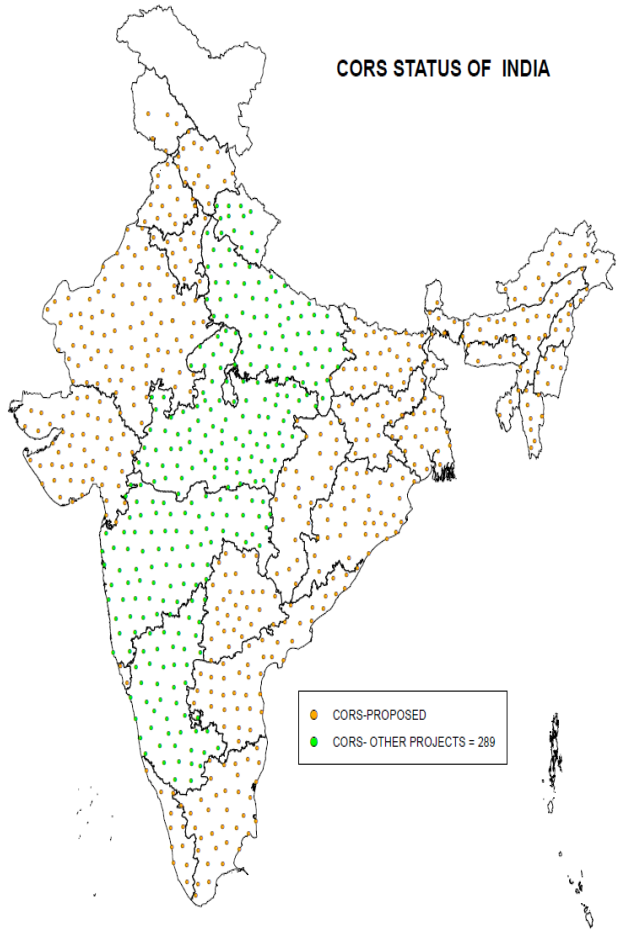
Annexure I: State wise count of Villages covered under Pilot Phase

Sl No.	States/UTs	Total Villages	Villages covered in Pilot Phase
1	Haryana	7,652	3,826
2	Karnataka	33,157	16,580
3	Madhya Pradesh	55,100	1000
4	Maharashtra	44,137	22,069
5	Uttar Pradesh	1,07,242	53,622
6	Uttarakhand	17,048	4000
		Total	**1,01,097**

State wise CORS Network Establishment under Pilot Phase

Sl No.	States/UTs	No of CORS Network Stations
1	Punjab	16
2	Rajasthan	85
	Total	**101**

Annexure II : State wise CORS Status



State	Numbers Of CORS Stations	State	Number Of CORS Stations
Andhra Pradesh	44	Meghalaya	6
Arunachal Pradesh	17	Mizoram	8
Assam	23	Nagaland	5
Bihar	29	Odisha	35
Chhattisgarh	26	Punjab	16
Goa	2	Rajasthan	85
Gujarat	49	Sikkim	1
Himachal Pradesh	13	Tamil Nadu	35
JandK (UT)	5	Telangana	27
Jharkhand	20	Tripura	3
Kerala	11	West Bengal	26
Manipur	6		

Source: Survey of India

Planning for establishment of CORS Network will be carried out to ensure optimum CORS Network configuration providing consistent accuracy, thus resulting in significant cost savings in comparison to state-wise approach as many States and UTs are of very small geographical area. Further, dedicated CORS network will not be planned in high hill areas, dense forest areas, International border areas, areas with sparse population, where CORS network correction service utilization will be very limited and these areas can be catered to with localized CORS network coverage, single baseline CORS stations etc. in due course by

Survey of India either under mandated activity or on case to case basis depending upon the specific user requirements.

Annexure III : Component to be funded by the State Governments, local bodies, user beneficiaries or private parties

A. State Government

i. Area/site for Continuously Operating Reference Stations network installation shall be provided by State Government, along with Electricity and physical security of CORS equipment's to Survey of India
ii. Hiring of field vehicles, hiring of local labours, accommodation for field teams etc.
iii. Ground marking of parcels/properties in area to be surveyed using white powder (Chuna etc.)
iv. Ground-Truthing, validation of Land Parcel maps shall be carried out by State Revenue Department
v. Digitization of existing GP property (Tax) Registers (wherever applicable) to make available to SoI and Enquiry Officer for preparing interim map/Records.
vi. Store, Host and update the data created under the SVAMITVA scheme; the survey could be revisited as per the frequency decided by the State Govt. or Panchayat for updating purpose.

B. Survey of India

i. Data Processing: Post processing of Unmanned Aerial Vehicle images shall be carried out by Survey of India (SoI) in Geographic Information System lab at SoI regional centre. The SoI shall use their hardware and software and their GIS Lab for data Processing
ii. Ground-Truthing and validation of topographical features as derived from ortho- rectified images shall be carried out by Survey of India

C. NIC-GIS

i. Store (if required), host and update (as per requirement) the DEM and GIS database created under SVAMITVA Scheme.

Annexure IV: Terms of Reference for Consultants

I. National Programme Management Unit

Key Responsibilities

i. Responsible for managing the day to day PMU activities.
ii. Keep track of project progress, keep the senior management and other important stakeholders informed about the project progress.
iii. Overall implementation and stakeholder coordination including facilitating awareness and handholding support
iv. Assistance to States and Survey of India viz. supporting with signing of MoU, fund disbursement to States, monitoring of project timelines etc.
v. Collaboration with Survey of India and States to monitor establishment of CORS network and large scale mapping using Drone.
vi. Provide functional inputs towards development and maintenance of online monitoring and reporting Dashboard of the Scheme
vii. Evaluation of the effectiveness of the scheme through verification and validating of project progress
viii. Cross State sharing and learning, documentation of good practices
ix. Co-ordinate the IEC activities at the national level to mobilize people to participate in drone survey. It will include running Campaign during National Panchayati Raj Day/week, dissemination of good practices and other national campaigns through various mediums including social media
x. Coordination with NIC-GIS division and NRSC Bhuvan for leveraging digital spatial data/maps created under drone survey to develop spatial analytical tools to support preparation of GPDP in Gram Manchitra application among other applications.
xi. Any other relevant activity.

Educational Qualifications

- BE/ B. Tech / Bachelors in relevant field

Experience

- 6 to 10 years

Domain Knowledge / Skills (Must Have)

- Worked in IT Project Management function or in an IT PMU/PMO setup

- Knowledge of e-Governance projects, Use of GIS and related technology.

Domain Knowledge / Skills (Preferred)

- Knowledge of latest GIS Survey technologies
- Experience in geospatial datasets and databases
- Familiarity with and usage of sources of open source maps/ shape files etc.

II. State Programme Management Unit

Key Responsibilities

i. Responsible for managing the day to day programme management activities.
ii. Keep track of project progress, keep the senior management and other important stakeholders informed about the project progress.
iii. Overall implementation and handholding to States and Survey of India.
iv. Support State Revenue department in evaluation and monitoring the progress of Large-Scale mapping using Drones
v. Consolidate the attribute information and other secondary information to be incorporated in the GIS database
vi. Support in ground-truthing of maps
vii. Facilitate signing of MoU between State and Survey of India and monitor the implementation timelines
viii. Facilitate Project progress reporting through regular updates in Monitoring Dashboard of Scheme
ix. Desirable knowledge of latest GIS Survey technologies and familiarity with and usage of sources of open source maps/ shape files etc
x. Any other relevant activity.

Educational Qualifications

- Any Graduate

Experience

- 1 to 3 years

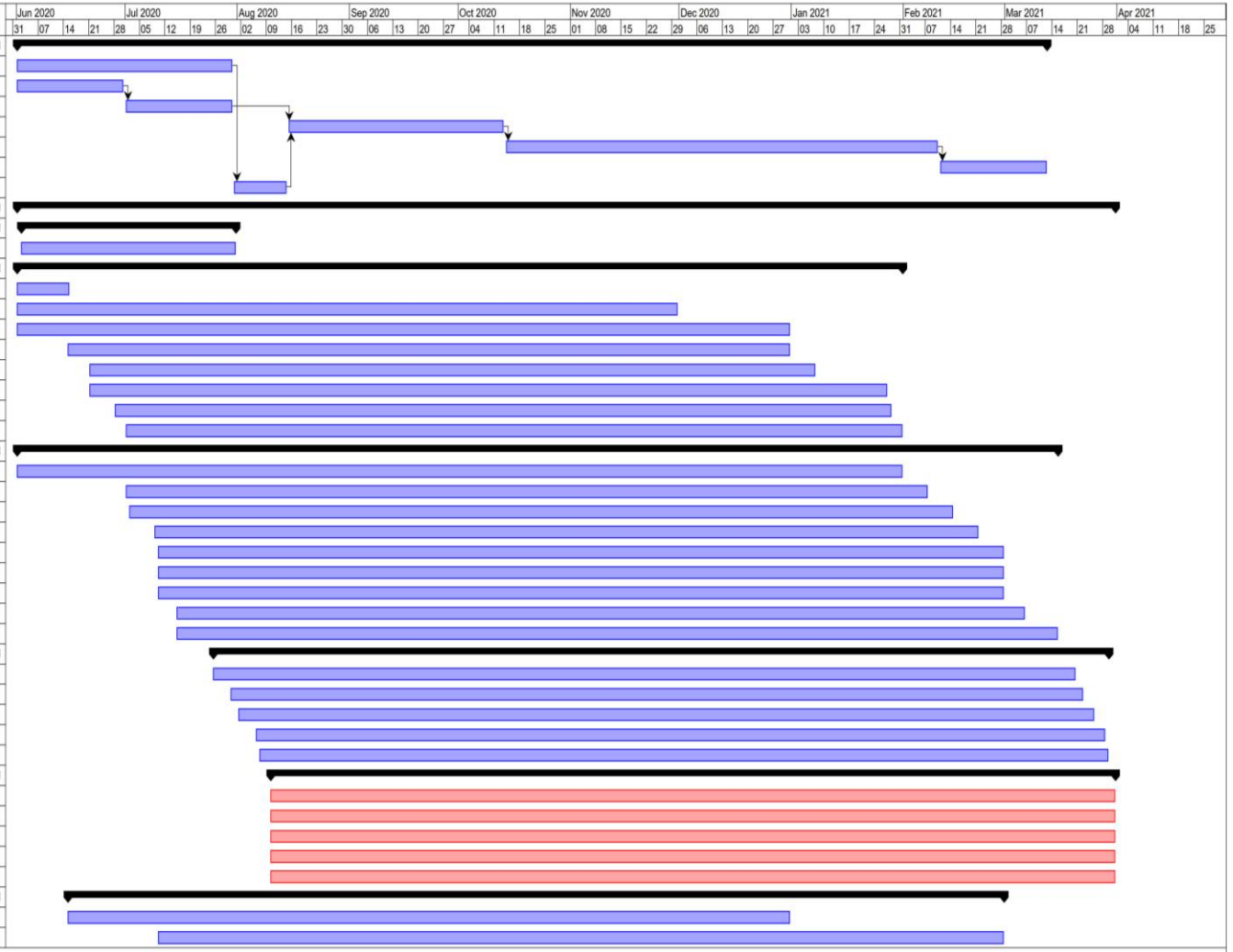
Annexure V: Sample Property Data Attributes

Sirsi Abadi Area Attribute Table

LGD/UID	FID	Sub_Type	OwnerType	OwnerName	BPL	OLD_AG_PEN	WIDOW_PENS	DISABILITY	PMAY_IAY	MGGBY_PLOT	DRINKING_W	Toilet	Plot Type	OLD_AG_P_1	WIDOW_PE_1	DISA_PENS	Total_Area	Builtup_Area	Open_Area
592800001	1	ABADI	PRIVATE	SHISHPAL S/O ISHAM SINGH	NO	NO	NO	NO	NO	NO	YES	YES	BUILDING	NO	NO	NO	974.26	283.914	690.346
592800002	2	ABADI	PRIVATE	TEJPAL SINGH S/O PRITHVI SINGH	NO	YES	NO	NO	NO	NO	YES	YES	BUILDING	BHAGWANTI DEVI	NO	NO	363.106	167.956	195.150
592800003	3	ABADI	PRIVATE	MAHIVEER S/O PRITHVI SINGH	NO	NO	NO	NO	NO	NO	NO	NO	PLOT	NO	NO	NO	318.155	19.456	298.699
592800004	4	ABADI	PRIVATE	RAJPAL S/O PRITHVI SINGH	NO	NO	NO	NO	NO	NO	YES	NO	CATTLE YARD	NO	NO	NO	279.743	63.828	215.915
592800005	5	ABADI	PRIVATE	JOGINDER S/O SHRI CHAND	NO	NO	NO	NO	NO	NO	YES	YES	BUILDING	NO	NO	NO	141.645	135.556	6.089
592800006	6	ABADI	PRIVATE	SHISH PAL S/O PREM SINGH	NO	NO	YES	NO	NO	YES	YES	YES	BUILDING	NO	SUKH DEVI	NO	101.57	101.570	0.000
592800007	7	ABADI	PRIVATE	HANSRAJ S/O PREM SINGH	NO	NO	NO	NO	NO	NO	YES	YES	BUILDING	NO	NO	NO	101.043	70.404	30.639
592800008	8	ABADI	PRIVATE	TEJPAL S/O SULTAN SINGH	NO	NO	NO	NO	NO	NO	YES	NO	CATTLE YARD	NO	NO	NO	263.877	75.343	188.534
592800009	9	ABADI	PRIVATE	NARESH S/O SUBE SINGH	NO	NO	NO	NO	NO	NO	YES	NO	CATTLE YARD	NO	NO	NO	276.353	32.627	243.726
592800010	10	ABADI	PRIVATE	SUDESH KUMAR S/O LIJJA RAM	NO	NO	NO	NO	NO	NO	YES	YES	BUILDING	NO	NO	NO	267.19	134.065	133.125
592800011	11	ABADI	PRIVATE	ROSHAN LAL S/O RAMANAND	NO	NO	NO	NO	NO	NO	YES	YES	BUILDING	NO	NO	NO	289.083	141.044	148.039
592800012	12	ABADI	PRIVATE	PARMOD S/O BIR SINGH	NO	NO	NO	NO	NO	YES	YES	YES	BUILDING	NO	NO	NO	56.314	56.314	0.000
592800013	13	ABADI	PRIVATE	SATYAWAN S/O KEHER SINGH	NO	NO	NO	NO	NO	NO	NO	NO	CATTLE YARD	NO	NO	NO	56.655	13.997	42.658
592800014	14	ABADI	PRIVATE	SATPAL S/O NAKAL RAM	YES	NO	NO	YES	NO	NO	YES	YES	BUILDING	NO	NO	RAHUL	100.331	76.122	24.209
592800015	15	ABADI	PRIVATE	SANDEEP KUMAR S/O GYANI RAM	NO	NO	NO	NO	NO	NO	YES	YES	BUILDING	NO	NO	NO	90.833	90.833	0.000
592800016	16	ABADI	PRIVATE	PURAN S/O SINGH RAM	NO	NO	NO	NO	NO	NO	YES	YES	BUILDING	NO	NO	NO	211.499	125.542	85.957
592800017	17	ABADI	PRIVATE	RAM KUMAR S/O LAL SINGH	NO	NO	NO	NO	NO	NO	NO	NO	CATTLE YARD	NO	NO	NO	94.813	87.439	7.374
592800018	18	ABADI	PRIVATE	VASHU DEV S/O RAMDHARI	YES	YES	NO	NO	NO	NO	YES	YES	BUILDING	DARSHANI DEVI	NO	NO	98.673	79.767	18.906
592800019	19	ABADI	PRIVATE	RAMDIYA S/O NEKI RAM	NO	NO	NO	NO	NO	YES	YES	YES	PLOT	NO	NO	NO	148.251	148.251	0.000
592800020	20	ABADI	PRIVATE	RAMESHWAR S/O JAGDISH	NO	NO	NO	NO	NO	NO	YES	YES	BUILDING	NO	NO	NO	89.656	76.372	13.284
592800021	21	ABADI	PRIVATE	RAM KUMAR S/O LAL SINGH	YES	YES	NO	NO	NO	YES	YES	YES	BUILDING	RAM KUMAR	NO	NO	78.523	49.011	29.512
592800022	22	ABADI	PRIVATE	KRISHAN S/O KANSHI RAM	NO	NO	NO	NO	NO	YES	YES	YES	BUILDING	NO	NO	NO	93.649	93.649	0.000
592800023	23	ABADI	PRIVATE	DESH RAJ S/O GENDHA RAM	YES	NO	NO	NO	NO	YES	YES	YES	BUILDING	NO	NO	NO	57.292	45.975	11.317
592800024	24	ABADI	PRIVATE	NIRMAL S/O GENDHE	YES	YES	NO	NO	NO	YES	YES	YES	BUILDING	NIRMAL & ROSHNI	NO	NO	108.303	91.848	16.455
592800025	25	ABADI	PRIVATE	GULAB SINGH S/O SUKAN CHAND	NO	NO	YES	NO	NO	YES	YES	YES	BUILDING	NO	SUKAN CHAND & SAVITRI DEVI	NO	160.989	87.921	73.068

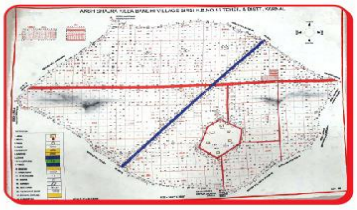
Annexure VI: Activity wise timelines provided by Survey of India

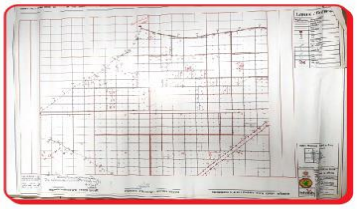
	Name	Duration	Start	Finish
1	**Establishment of CORS Network**	**285 days**	**1/6/20 8:00 AM**	**12/3/21 5:00 PM**
2	Tendering for Outsourcing on Tunkey Basis	60 days	1/6/20 8:00 AM	30/7/20 5:00 PM
3	Site Selection and Ground Recce	30 days	1/6/20 8:00 AM	30/6/20 5:00 PM
4	Approval of Site owner	30 days	1/7/20 8:00 AM	30/7/20 5:00 PM
5	Monumentation	60 days	15/8/20 8:00 AM	13/10/20 5:00 PM
6	Installation and Commissioning	120 days	14/10/20 8:00 AM	10/2/21 5:00 PM
7	Integration with NSRF	30 days	11/2/21 8:00 AM	12/3/21 5:00 PM
8	Award of Work and Contract Signing	15 days	31/7/20 8:00 AM	14/8/20 5:00 PM
9	**Large Scale Mapping Using Drone**	**304 days**	**1/6/20 8:00 AM**	**31/3/21 5:00 PM**
10	**Drone procurement**	**60 days**	**2/6/20 8:00 AM**	**31/7/20 5:00 PM**
11	Tendering & Award	60 days	2/6/20 8:00 AM	31/7/20 5:00 PM
12	**Pre Survey Activities**	**245 days**	**1/6/20 8:00 AM**	**31/1/21 5:00 PM**
13	Permission & Clearances from DGCA & MoD	15 days	1/6/20 8:00 AM	15/6/20 5:00 PM
14	Acqusition of Available Records and Maps provided by State Govt	183 days	1/6/20 8:00 AM	30/11/20 5:00 PM
15	Scanning of Available Records and Maps provided by State Govt	214 days	1/6/20 8:00 AM	31/12/20 5:00 PM
16	Legal Notification of Abadi Area Survey	200 days	15/6/20 8:00 AM	31/12/20 5:00 PM
17	Legal Notice for conducting Property Survey to Gram Sabha	201 days	21/6/20 8:00 AM	7/1/21 5:00 PM
18	Campaign to sensitize villagers about project benefits	221 days	21/6/20 8:00 AM	27/1/21 5:00 PM
19	To Organize Gram Sabha	215 days	28/6/20 8:00 AM	28/1/21 5:00 PM
20	Marking of Property Boundaries with Chuna Lines	215 days	1/7/20 8:00 AM	31/1/21 5:00 PM
21	**Survey Activities**	**288 days**	**1/6/20 8:00 AM**	**15/3/21 5:00 PM**
22	Provisioning of Ground Control Points for Flying	245 days	1/6/20 8:00 AM	31/1/21 5:00 PM
23	Mission Planning for Drone Flying	222 days	1/7/20 8:00 AM	7/2/21 5:00 PM
24	Drone Flying	228 days	2/7/20 8:00 AM	14/2/21 5:00 PM
25	Drone Data Processing	228 days	9/7/20 8:00 AM	21/2/21 5:00 PM
26	Feature Extraction	234 days	10/7/20 8:00 AM	28/2/21 5:00 PM
27	Attribute Entry and Linking with Features	234 days	10/7/20 8:00 AM	28/2/21 5:00 PM
28	Numbering of Properties	234 days	10/7/20 8:00 AM	28/2/21 5:00 PM
29	Ground Validation of Topographical Features	235 days	15/7/20 8:00 AM	6/3/21 5:00 PM
30	Ground Validation of Properties	244 days	15/7/20 8:00 AM	15/3/21 5:00 PM
31	**Post Survey Activities**	**248 days**	**25/7/20 8:00 ...**	**29/3/21 5:00 PM**
32	Issue of Notification for Joint Verification of Ownership	239 days	25/7/20 8:00 AM	20/3/21 5:00 PM
33	Property ownership Adjudication	236 days	30/7/20 8:00 AM	22/3/21 5:00 PM
34	Issue of Notification to provide results of Adjudication	237 days	1/8/20 8:00 AM	25/3/21 5:00 PM
35	Resoution Post Survey Objections	235 days	6/8/20 8:00 AM	28/3/21 5:00 PM
36	Post objection finalization of land parcel Maps	235 days	7/8/20 8:00 AM	29/3/21 5:00 PM
37	**Delivery of Final Ouputs**	**234 days**	**10/8/20 8:00 ...**	**31/3/21 5:00 PM**
38	OrthoRectified Images (ORI)	234 days	10/8/20 8:00 AM	31/3/21 5:00 PM
39	GIS Database	234 days	10/8/20 8:00 AM	31/3/21 5:00 PM
40	Digital Elevation Model	234 days	10/8/20 8:00 AM	31/3/21 5:00 PM
41	Property Card Data (RoR)	234 days	10/8/20 8:00 AM	31/3/21 5:00 PM
42	Hardcopies Maps (4 set per village)	234 days	10/8/20 8:00 AM	31/3/21 5:00 PM
43	**Training & Capacity Building**	**259 days**	**15/6/20 8:00 ...**	**28/2/21 5:00 PM**
44	Phase I	200 days	15/6/20 8:00 AM	31/12/20 5:00 PM
45	Phase II	234 days	10/7/20 8:00 AM	28/2/21 5:00 PM



Annexure VII: SOP prepared for Drone Survey by Karnal District, Haryana

Step-1





किसी भी गांव / Estate को लाल डोरा मुक्त करना है। उसके लिए सबसे पहले हमें उस गांव की मशावी तथा शिजरा Survey of India को Scanning करने के लिए सौंपना है, ताकि Survey of India उसे स्कैन कर सके। इस बात का ध्यान रखे कि Scaning करवाने से पहले हमें लाल डोरे की सीमा तक के ततीमाजात जो हारट्रौन द्वारा हमें सफेद मशावी सौंपी गई थी उस पर काटे जा चुके है।

Step-2

सर्वेरी पत्थर



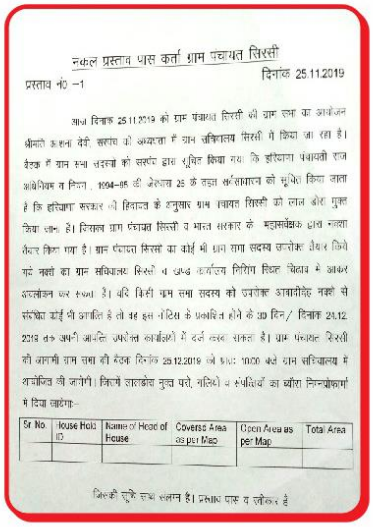
सेहदा



Survey of India इस्तेमाल के पत्थरों यानि मुस्ततील मौकों की सहायता से संबंधित गाँव की बाउंडरी को कायम करेगें तथा अपने Cordinates स्थापित करेगें जो Cordinates Survey of India द्वारा दिए गये है उनको राजस्व विभाग के कर्मचारियों द्वारा सर्वेरी पत्थरों की सहायता से पैमाईश करके मिलान करना है ताकि उनमें कोई अंतर ना रहे तथा उनकी जांच पड़ताल सुनिश्चित हो सके। Cordinates जांच पड़ताल होने उपरान्त Survey of India विभाग के कर्मचारी लाल डोरा को कायम करेगें तथा फिरनी को भी कायम करेगें। अपनी सन्तुष्टि के लिए राजस्व विभाग को भी पैमाईश करके लाल डोरा तथा फिरनी को कायम कर लेना है तथा दोनों विभागों द्वारा कायम किए गए मौका मिलान होने पर आगामी कार्यवाही अमल में लाई जाऐगी।

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Step-3



नक्शा प्रस्तुत पास कर्ता ग्राम पंचायत सिरसी

प्रस्ताव नं0 –1 दिनांक 25.11.2019

आज दिनांक 25.11.2019 को ग्राम पंचायत सिरसी की ग्राम सभा का आयोजन श्रीमती कल्पना देवी, सरपंच की अध्यक्षता में ग्राम चौपाल सिरसी में किया जा रहा है। बैठक में ग्राम सभा सदस्यों को सरपंच द्वारा सूचित किया गया कि हरियाणा पंचायती राज अधिनियम, 1994–95 की धारा 26 के तहत कर्तव्यादान को सूचित किया जाता है कि हरियाणा सरकार की हिदायत के अनुसार ग्राम पंचायत सिरसी को लाल और मुक्त किया जाना है। जिसके ग्राम पंचायत सिरसी व भारत सरकार के महासर्वेक्षक द्वारा नक्शा तैयार किया गया है। ग्राम पंचायत सिरसी का कोई भी ग्राम सभा सदस्य छपरौंक तैयार किये गये नक्शे का ग्राम सचिवालय सिरसी व उप-कार्यालय गिरिराज सिंह चौहान में आकर अवलोकन कर सकता है। यदि किसी ग्राम सभा सदस्य को उपरोक्त आबादीदेह नक्शे से संबंधित कोई भी आपत्ति है तो वह इस नोटिस के प्रकाशित होने के 30 दिन/ दिनांक 24.12.2019 तक अपनी आपत्ति उपरोक्त कार्यालयों में दर्ज करवा सकते है। ग्राम पंचायत सिरसी की आगामी ग्राम सभा की बैठक दिनांक 25.12.2019 को 9:00 बजे ग्राम चौपाल में आयोजित की जायेगी। जिसमें उपरोक्त नुक्ता परो, गलियों व रास्तों का खोल निम्नोक्तानुसार में दिया जायेगा:-

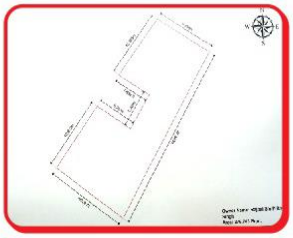
Sr No.	House Hold ID	Name of Head of House	Coverss Area as per Map	Open Area as per Map	Total Area

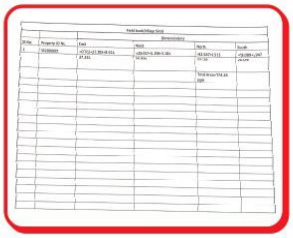
जिसकी सूचि सभा समक्ष है। प्रस्ताव पास व स्वीकार है

पंचायत विभाग द्वारा पंचायती राज एक्ट 1994-95 की धारा 26 के अधीन दी हुई शक्तियों का प्रयोग करके अन्दर आबादी के नक्शें को तैयार करने का प्रस्ताव पास किया जाएगा।

Step-4







Survey of India द्वारा Drone Flying करके अन्दर आबादी के Street/Plots/Buildings/Vacant Land/ Govt.Land etc. की मैपिंग की जाएगी तथा इसके लिए पंचायती विभाग द्वारा सफैदी लगाने का कार्य किया जाएगा। Survey of India विभाग द्वारा Drone Mapping करने उपरान्त जो Property Identified हुई है । उसके कोड नम्बर,नक्शा व फिल्ड बुक प्रथम चरण के लिए दिये जाऐगें । Objection आने से पहले का समय ।

Step-5



Drone Mapping के बाद Survey of India द्वारा जो Map ID No. सहित पंचायत विभाग को सौंपा जाऐगा इस डंच की सहायता से पंचायत विभाग Ground Level पर जो Street/ Plots/Buildings/ Vacant Land/Govt. Land ect है । उससे मिलान किया जाएगा अर्थात उपरोक्ता पर कौन- कौन व्यक्ति काबिज है। तथा उस ID No. की जितनी भी सीमायें है। उसके पूर्व, पश्चिम, उत्तर, दक्षिण में कौन-कौन व्यक्ति लगता है का विवरण तैयार किया जाएगा तथा इसकी फिल्ड बुक भी तैयार की जाएगी ।

"उपरोक्त कार्य पंचायत विभाग द्वारा पूर्ण करने के उपरान्त ग्राम आम जन से आपत्तियां माँगी जाएगी। जिसकी समय सीमा 30 दिन की होगी । आपत्तियां निम्न प्रकार की हो सकती है "

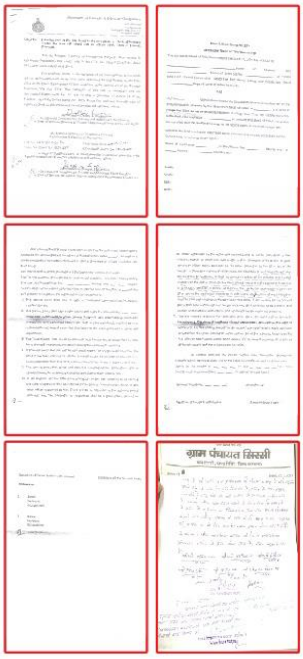
1. किसी व्यक्ति का नाम गलत दर्ज हो - स्वयं, पिता व पति का
2. किसी को अपनी सीमाओ पर ऐतराज हो सकता है।
3. किसी व्यक्ति को अपनी ID No. पर आपत्ति हो सकती है यानि सयुक्त परिवार को एक ID No. दिया गया हो और परिवार के सदस्य अलग-अलग करवाना चाहते हो।
4. किसी व्यक्ति को सयुंक्त परिवार की ID No. में शामिल न किया गया हो ।
5. किसी व्यक्ति को अपने क्षेत्रफल पर भी ऐतराज हो सकता है।
6. किसी ID पर कब्जा दो य दो से अधिक लोगो का हो और नाम एक का दर्ज हो गया हो।
7. कब्जा किसी व्यक्ति का हो ओर व्यक्ति का दर्ज हो गया हो इत्यादि।
8. अगर कोई विवाद Civil Court में लम्बित हैं या Deputed Stay हैं तो उस Property का ID No. देकर Deputy Property चला जा सकता है तथा निर्णय होने उपरान्त उसका निपटारा किया जाये।

Step-6

ग्राम आम सभा



Objection को सुनकर ग्रांम सभा द्वारा निर्णय किया जाएगा, निर्णय उपरान्त यदि कोई त्रुटि पाई जाती है। तो ग्रांम पंचायत अपने रिकार्ड में तथा Survey of India के नक्शे में तथा रिकार्ड जो उन द्वारा तैयार किया जा रहा है। उसमें दुरूस्ती करवाएगी । अन्तिम निर्णय का अधिकार सम्बन्धित कलैक्टर को दिया गया हैं



Step-7

Objection का निपटारा होने के बाद पंचायत विभाग संबंधित लोगों के नाम Certifcate/ Deed of title/ Ownership करवाने के लिए पंचायत विभाग के माध्यम से प्रस्ताव Finanacial Commissioner, Revenue & Additional Cheif Secretary to Govt. of Haryana, Revenue & Disaster Management Deptt. Chandigarh को अनुमोदन के लिए भेजा जाएगा। उनके आदेश प्राप्त होने के उपरान्त पंचायत विभाग प्रस्ताव पास करके प्रस्ताव की सलंगन करके तथा जो रिकाई फाईनल हुआ है, उसके अनुसार संबंधित पक्षों के Certificate/ Deed of Title/ Ownership सम्बन्धित तहसील/ उपतहसील में रजिस्टर्ड करवाऐगें। डीड रजिस्टर्ड करवाने के लिए जो पंचायत विभाग द्वारा अधिकृत होगा वही डीड रजिस्टर्ड करवा सकता है।

Step-8

जो लाल डोरे का Survey of India तथा पंचायत विभाग द्वारा तैयार किया गया है उसे पूर्ण होने के उपरान्त पंचायत विभाग द्वारा Maintain किया जाएगा तथा आगे जो भी फेर-बदल होगा उसका रिकार्ड भी Update पंचायत विभाग अपने स्तर पर करेगा।



MINISTRY OF PANCHAYATI RAJ
GOVERNMENT OF INDIA