SVAMITVA

Survey of Villages Abadi and Mapping with Improvised Technology in Village Areas

Edited by **MOHAN DAS VISWAM**

Survey of Villages Abadi and Mapping with Improvised Technology in Village Areas (SVAMITVA) scheme aims to provide an integrated property validation solution for rural India. The scheme clearly establishes property ownership in rural populated areas by mapping land parcels using drone technology and issuing legal ownership cards (Property cards / Title deeds) to the rural household owners. This would allow them to use their property as collateral for loans and other financial aid from financial institutions. It would aid in the determination of property tax, which would accrue directly to Gram Panchayats or be added to the state treasury. In addition, it would help in the preparation of a better Gram Panchayat Development Plan (GPDP) by making use of high quality Geographic Information System (GIS) maps.

SVAMITVA Dashboard

SVAMITVA Dashboard is an eponymous dashboard that has been developed to showcase

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SVAMITVA scheme is a reformative step towards the establishment of clear ownership of property in rural inhabited areas by mapping of land parcels using Drone technology and providing a 'Record of Rights' to village household owners with the issuance of legal ownership cards to the property owners. The scheme helps in facilitating monetisation of properties; reducing property related disputes; and making comprehensive village level development plans. Thus, it would be the stepping-stone towards achieving Gram Swaraj in the true sense and making rural India Atmanirbhar.

the progress in terms of Key Performance Indicators (KPIs). It displays the scheme's progress by integrating and updating seamlessly the on-field data from the Survey of India (SoI) using an application programming interface (API). It has been designed on the basis of monitoring parameters of the scheme.

The activities of SVAMITVA can be divided into four stages.

First Stage (Preliminary Activities): In this stage, Abadi areas are notified by the respective state officers. An awareness programme is also implemented to educate the rural populace on the surveying methodology and its benefits. Meanwhile, local officials are trained to handle the project activities.

Second Stage (Pre-survey Activities): The Continuously Operating Reference Stations (CORS) are established by Survey of India (SoI) nationwide. CORS is a network of permanently installed reference stations which broadcast corrections, continuously over an Internet connection. It can solve the problem of data accuracy and real-time data acquisition. It enables surveyors to differentially correct static Global Positioning System (GPS) measurements, which would aid in geo-referencing RAW (format) images collected from drones and extract the demarcation of the land to vector format.

Third Stage (Survey Activities): The area is earmarked with limestone in consultation with the Gram Panchayat and land owners. Following which, the surveying is done with drones.

Fourth Stage (Post-survey Activities): In the final stage, the spatial lab at NIC Headquarters process the orth-rectified imagery output of the drone survey. The processed data is then incorporated into Bharatmaps in order to power the analytics dashboard.

Also, the meta-data associated with the

properties is being captured during the field visit by the local officials. This data is mapped with the spatial data captured by the drones, forming the basis for the creation of property cards for rural Abadi residents. Each process activity is properly recorded and showcased over the dashboard for everyone's benefit. (Refer Fig. 8.3)

Benefits

Key benefits of SVAMITVA Dashboard are

- KPI-driven dashboard with updated information from the Survey of India
- Overall progress monitoring
- Daily progress monitoring
- Spatial visualisation of drone flown state-wise and district-wise information navigation
- Analytical reports for decision-making
- Automated SMS notifications to stakeholders about drone flight schedules

Technical Specifications

SVAMITVA dashboard architecture can be divided into spatial and non-spatial architectures. The dashboard is powered by the robust Java Spring MVC API over a Postgres database. On the other hand, the service-oriented architecture is deployed for synchronised map delivery over cached service for effective operation over low bandwidth powered by Bharatmaps.
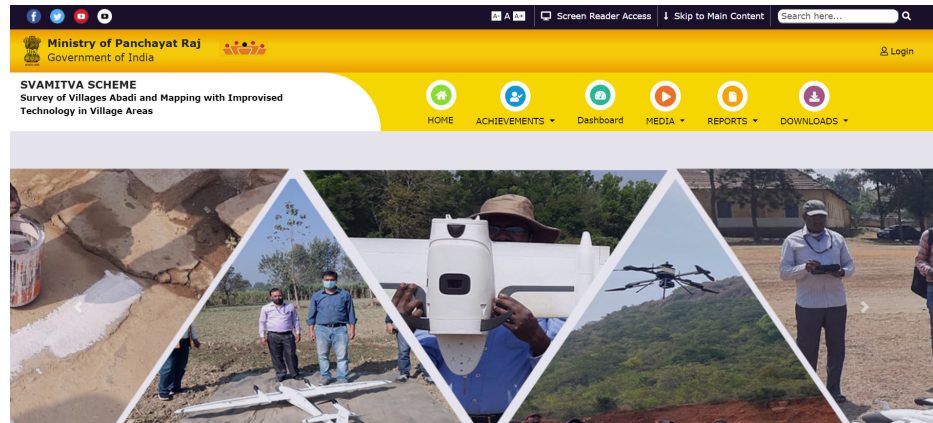
Components

- **User Management:** Nodal officers can use this module to assign user roles, i.e., who can access the portal to monitor the scheme. (Refer Fig. 8.6)
- **Document Management:** This module helps the users manage the documents. Once uploaded, files are reflected here. (Refer Fig. 8.7)
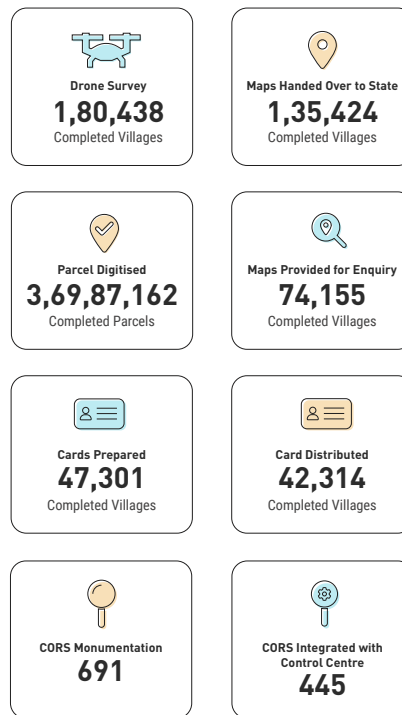
SVAMITVA Scheme is a technology driven solution which uses drones to map rural Abadi areas. NIC has been mandated to provide IT support and create GIS data repository and integrate the same with Grammanchitra application for rural planning. The SVAMITVA dashboard provides a gateway for monitoring the scheme effectively. SVAMITVA Scheme is playing a pivotal role in making rural India self-reliant in a true sense.

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▲ **Fig. 8.1: SVAMITVA Portal Homepage**

Drone Survey	Maps Handed Over to State
1,80,438	**1,35,424**
Completed Villages	Completed Villages

Parcel Digitised	Maps Provided for Enquiry
3,69,87,162	**74,155**
Completed Parcels	Completed Villages

Cards Prepared	Card Distributed
47,301	**42,314**
Completed Villages	Completed Villages

| CORS Monumentation	CORS Integrated with Control Centre
691	**445**

▲ **Fig. 8.2: SVAMITVA Portal Statistics**

- **Drone Flying Monitoring:** With the help of this module, users can keep an eye on drone surveys taking place all over the nation. The unsurveyed areas are marked as red-tape areas. (Refer Fig. 8.8)
- **Dynamic Content Management:** This allows management of various publications, such as media reports and IEC activities.
- **Report Management:** This module assists in generating a number of reports for the SVAMITVA scheme, including reports on geospatial data, progress, and drone surveying. (Refer Fig. 8.9)
- **Drone Flying Notified Villages List:** This module helps in tracking the notified villages for drone surveying in various districts across the state. (Refer Fig. 8.10)

SVAMITVA Scheme is a Government of India initiative that uses drones and Continuously Operated Reference Stations (CORS) to map rural Abadi areas with the active participation of State and Survey of India. This has brought thousands of square kilometers of land under the mainstream credit-pool. Benefits are realised by local government planners and monitors as Digital maps are being utilised for various applications. Digitised maps are being leveraged to help Panchayats prepare better development plans. The scheme is set to change how land gets measured, which has seminal implications. As in September'22, the job is nearly half done.
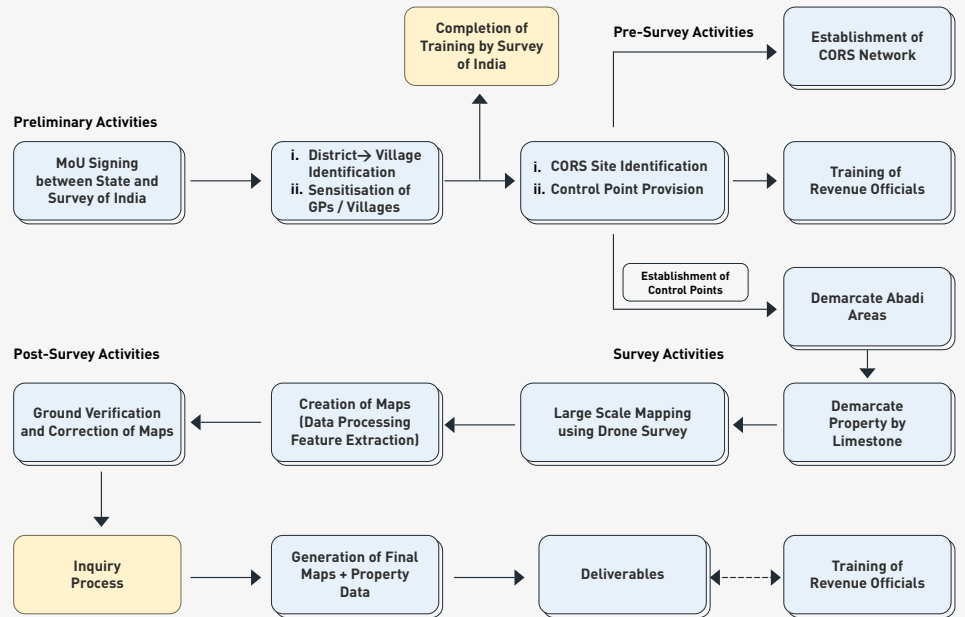

Alok Prem Nagar
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Government of India

- **Success Stories Management:** Nodal officers can use this module to add and publish new success stories at the state / district level based on approval.
- **State Dashboard:** This module gives a brief overview of progress made on various scales in the SVAMITVA scheme across a particular state.
- **Spatial Management:** This module provides a brief summary of SVAMITVA scheme across the country. It also helps user to track the success of the project across the country through KPI monitoring. The module also has provisions for document and report management. (Refer Fig. 8.11)
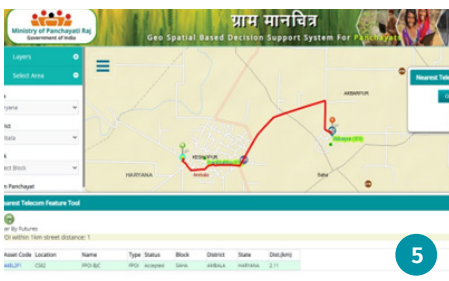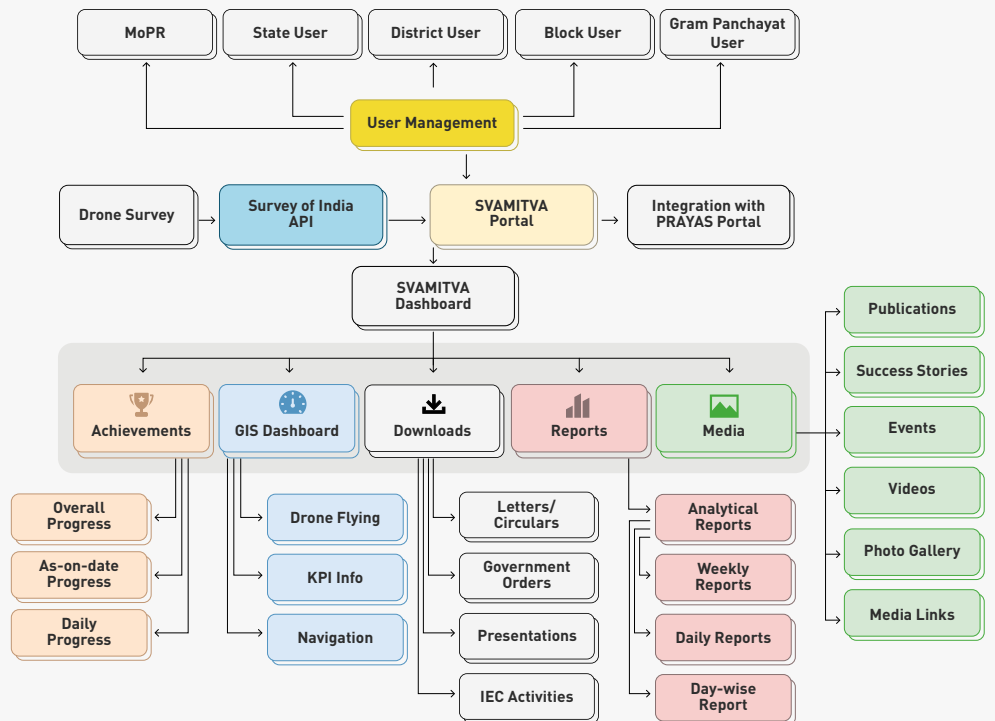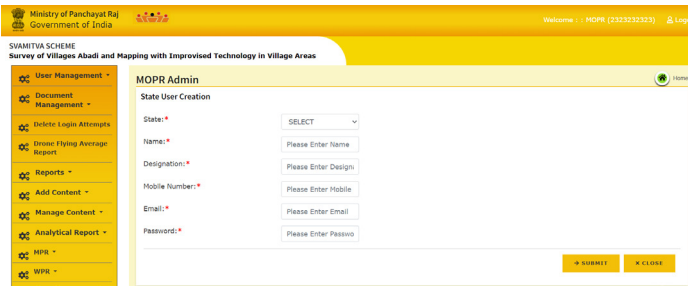
▲ Fig. 8.5: SVAMITVA Drone Data integrated with Gram Manchitra Application to develop geospatial tools for planning (1) street lights, (2) road construction, (3) service areas, (4) heatlhcare centre and (5) telecom asset management area under Gram Panchayat Development Plan.
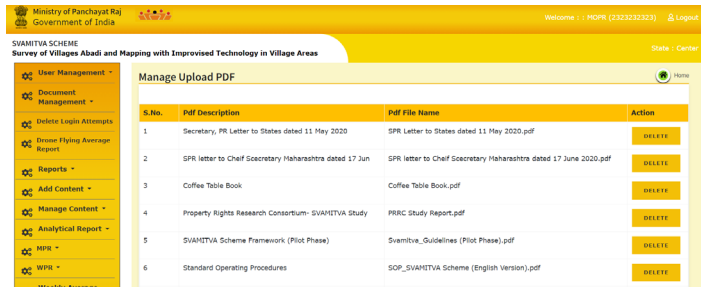
▼ **Fig. 8.3: SVAMITVA workflow**

Preliminary Activities

MoU Signing between State and Survey of India → i. District→ Village Identification ii. Sensitisation of GPs / Villages → i. CORS Site Identification ii. Control Point Provision

Completion of Training by Survey of India

Pre-Survey Activities

Establishment of CORS Network

Training of Revenue Officials

Establishment of Control Points

Demarcate Abadi Areas

Post-Survey Activities   **Survey Activities**

Ground Verification and Correction of Maps ← Creation of Maps (Data Processing Feature Extraction) ← Large Scale Mapping using Drone Survey ← Demarcate Property by Limestone

Inquiry Process → Generation of Final Maps + Property Data → Deliverables ⇠ Training of Revenue Officials

▼ **Fig. 8.4: SVAMITVA Dashboard User Activity Flow**

MoPR | State User | District User | Block User | Gram Panchayat User

User Management

Drone Survey → Survey of India API → SVAMITVA Portal → Integration with PRAYAS Portal

SVAMITVA Dashboard

Achievements | GIS Dashboard | Downloads | Reports | Media

Overall Progress
As-on-date Progress
Daily Progress

Drone Flying
KPI Info
Navigation

Letters/Circulars
Government Orders
Presentations
IEC Activities

Analytical Reports
Weekly Reports
Daily Reports
Day-wise Report

Publications
Success Stories
Events
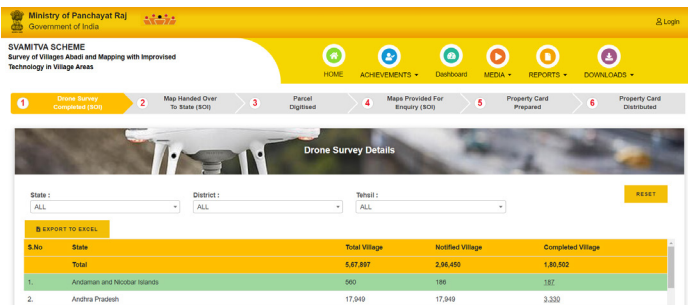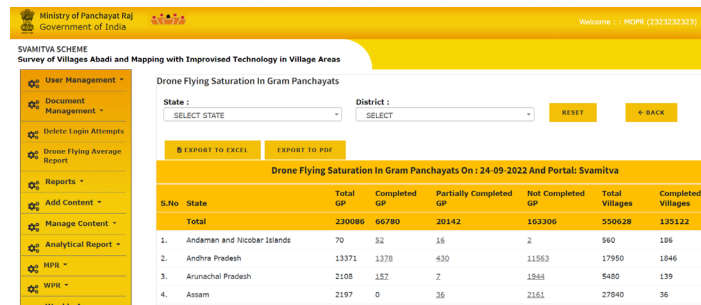Videos
Photo Gallery
Media Links
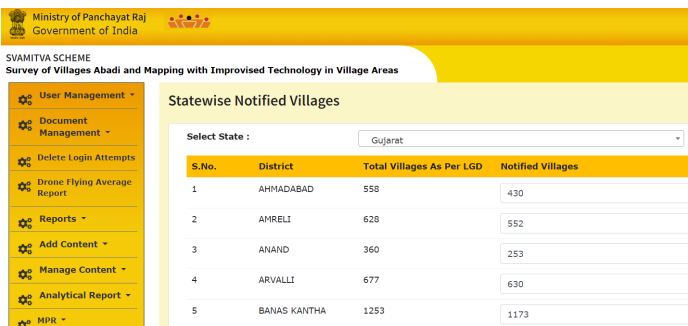
▲ Fig. 8.6: SVAMITVA User Management

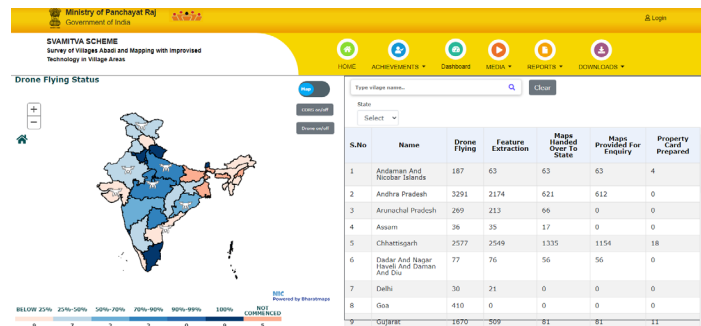▲ Fig. 8.7: SVAMITVA Document Management

▲ Fig. 8.8: SVAMITVA Drone Flying Monitoring

▲ Fig. 8.9: SVAMITVA Report Management

▲ Fig. 8.10: SVAMITVA Drone Flying Statewide Notified Villages

▲ Fig. 8.11: SVAMITVA All India Monitoring

Way Forward

It is proposed to analyse the data collected by a drone survey through the creation of various AI / ML-based models, which can help identify development gaps during the implementation of various schemes at the Gram Panchayat level.

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