

Report of the Committee constituted to consider the unit cost of survey/resurvey and updating of survey and settlement records (including ground control network and ground truthing) of the National Records Modernization Programme (NLRMP).

The Core Technical Advisory Group (CTAG) constituted under the NLRMP in its 1st meeting held on 11th March, 2011 considered the recommendations of the Committee constituted to consider the unit cost for survey/resurvey and updating of survey and settlement records (including ground control network and ground truthing). The CTAG, after detailed discussions, decided that the committee will re-examine the report keeping in view the observations of CTAG members. The recommendations were reconsidered by the Committee in its meeting held on 27.05.2011 and 14.07.2011.

2. The Committee makes the following recommendations for revision of cost norms in respect of different survey methodologies.

I) Pure Ground Survey Method using Electronic Total Station (ETS) and Global Positioning System (GPS) - (Rate per Sq. Km.)

- A) Establishment of Primary, Secondary and Tertiary Ground Control Points and integration of primary control points with geodetic network of India & monumentation of primary, secondary and selected tertiary control points
- Rs 2000/-
- B) Detail^{ed} survey by GPS/ETS (capturing of parcel measures and other required objects) - Rs. 12,000/-
- C) Processing and Map preparation - Rs 1000/-
- D) Printing of Maps (A0-Rs 300/-, A1-Rs 150/-, A4-Rs 5/-) – Assuming 100 Land parcel in 1 Sq Km- Average printing cost per Sq Km – Rs 1500/-

- E) Integration of textual details with maps (Rs 5 per record)-Assuming 100 land parcel/Sq Km – Rs 500/-
- F) Generation and Serving of notices along with Land Parcel Details with maps & dimensions to land owners – Rs 500/-
- G) Sundry Expenditure including printing of various registers - Rs 500/-

Total **Rs. 18,000.00**

II) Hybrid methodology using aerial photography and ground truthing by ETS and GPS - (Rate per Sq. Km.)

- A) Establishment of Primary, Secondary and Tertiary Ground Control Point and integration of primary control points with geodetic network of India with & monumentation of primary, secondary and selected tertiary control points
- Rs 2000.00
- B) Aerial photography - Rs. 7000
(Acquisition of aerial photography, geo-referencing, ground truthing and Ortho-image generation)
- C) Feature capturing
 - a) (Vectorization of parcel boundaries) – Rs 1200/-
 - b) Point/line/polygon feature extraction- Rs 800/-
- D) Field validation Rs. 2500/-
(up-to 25% ground validation)
- E) Printing of Maps (A0-Rs 300/-, A1-Rs 150/-, A4-Rs 5/-) – Assuming 100 Land parcel in 1 Sq Km- Average printing cost per Sq Km – Rs 1500/-
- F) Integration of textual details with maps (Rs 5 per record)-Assuming 100 land parcel/Sq Km – Rs 500)

G) Generation and Serving of notices along with Land Parcel Details with maps & dimensions to land owners – Rs 500/-

H) Sundry Expenditure including printing of various registers - Rs 500/-

Total

Rs. 16500/-

III) High Resolution Satellite Imagery (HRSI) and ground truthing by ETS and GPS) - (Rate per Sq Km)

A) Establishment of Primary, Secondary and Tertiary Ground Control Point and integration of primary control points with geodetic network of India with & monumentation of primary, secondary and selected tertiary control points – Rs 2000.00

B) Satellite data base generation Rs. 6000.00

a. (Acquisition of HRSI satellite data geo-referencing, ground truthing and Ortho-image generation)

C) Feature capturing

Vectorization of parcel boundaries – Rs 1200/-

Point/line/polygon feature extraction – Rs 800/-

D) Field validation Rs. 2500.00

a. (up to 25% ground validation, corrections and final hard copy/soft copy generation)

E) Printing of Maps (A0-Rs 300/-, A1-Rs 150/-, A4-Rs 5/-) – Assuming 100 Land parcel in 1 Sq Km- Average printing cost per Sq Km – Rs 1500/-

F) Integration of textual details with maps (Rs 5 per record)-Assuming 100 land parcel/Sq Km – Rs 500)

G) Generation and Serving of notices along with Land Parcel Details with maps & dimensions to land owners – Rs 500/-

H) Sundry Expenditure including printing of various registers - Rs 500/-

Total

Rs. 15,500.00

3. The above rates are exclusive of local and central taxes. The taxes will be sanctioned/reimbursed, as per the actual, by Government of India. The rates finalized for various items within each technology option are tentative, it may vary from State to State hence internal sectoral adjustment within the total cost can be done by the States/UTs. The Committee also recommends additional 20% of the above cost norms for NE States and hill States of Himachal Pradesh, Jammu & Kashmir and Uttarakhand.

4. The Committee also deliberated on the issues related to use of above modern survey technologies. Keeping in view the accuracy standards required for cadastral survey, use of pure ground survey method is suggested for original cadastral survey/resurvey. This methodology is also suitable for densely vegetated areas and hilly areas. Use of hybrid methodology using aerial photographs and ETS & GPS is suggested for survey/resurvey of plain areas, where good quality cadastral maps are available. This technology is also appropriate for hilly areas where terrain corrected aerial photographs can be generated. Use of HRSI and ETS & GPS is recommended for resurvey of large open areas where bunds are prominent and good quality, reasonably up to date, cadastral maps are available. Further, the HRSI may be overlaid over the existing cadastral maps and resurvey may be carried out using ETS/GPS for the areas, where there are discrepancies. The GCN being established for

survey/resurvey should be integrated with geodetic network of India for seamless integration of cadastral maps.

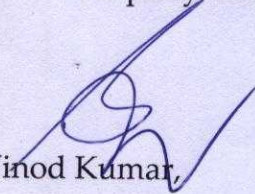
5. The Committee Members are of the view that after completion of survey/resurvey operations in a district, maintenance and updation of the digital data should be a regular exercise so that the records remain real time and up to date. For this purpose, while the maintenance cost should be met by the State Govts., modern survey equipments need to be given to each District and Tehsil. Accordingly, 2 DGPS per district and 2 ETS per Tehsil are suggested.

6. The use of modern technologies for survey/resurvey requires a high level technological inputs and professional expertise at every stage. In order to complete the work within a reasonable time-frame, outsourcing is suggested for survey/resurvey operations. However, State Governments need to have full control and responsibility for quality check.

7. The Committee Members are of the view that the deliverables for survey/resurvey operations need to be defined as per the requirements of the States. Some of the deliverables are suggested as follows:

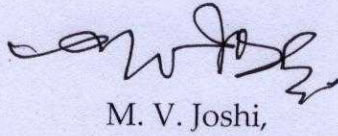
- ✓ GCN data in hard & Soft copy (Primary-Secondary-Tertiary Data Map+ Photograph+ location + XYZ data on WGS Datum)
- ✓ New District Map, Taluka Map, village Map and all Land Parcel Maps in Hard and Soft copy

✓ Properly binded Land Records Registers – Hard and Soft copy



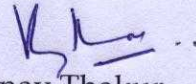
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