

A BRIEF NOTE ON USE OF GIS IN PREPARATION OF WORKING PLANS IN MAHARASHTRA STATE

GIS was introduced in the Forest Department in Maharashtra state under the World Bank Project in the year 1995, when a pilot project was undertaken in Brahmapuri Division with the help of Regional Remote Satellite Service Centre (RRSSC), Nagpur. On the recommendations of RRSC, Modular GIS Environment (MGE) and Geo-Media software were procured in 1997 and a GIS cell was established in the office of erstwhile Conservator of Forests, Working Plan Circle, Nagpur.

2.00 Application of GIS software in preparation of Working Plans helped a lot since creation of GIS cell, which are as under. :

- (a) Compiling geospatial data and making it available in digital form and using it as per the requirement.
- (b) Identifying different crop composition using enumeration data.
- (c) Identifying areas having slopes more than 25 degrees by using digital data of contours and generating slopes.
- (d) Generating 20 m wide buffer along drainages.
- (e) Identifying blanks and well stocked forest areas.
- (f) Quick and accurate preparation of treatment maps/stock maps using remote sensing data.
- (g) GIS is a very effective tool for Forest Resource management, like identification of suitable areas for tree felling, afforestation, soil and moisture conservation, fire protection etc.

3.00 The Process involved in the application of GIS in preparation of Working Plans is as under:

- (a) Scanning of SOI topo-sheets and Village Maps.
- (b) Registration of Maps.
- (c) Digitization of various features, like contours, drainage, roads, forest boundaries and other important relevant features.
- (d) Insertion of classified satellite data.

(e) Preparation and printing of maps on desired scales.

4.00 Modern tools like GPS are used for preparation of maps, as it is an effective tool for delineating ground locations. Remote sensing data are quite useful for expediting work, and improving quality and reliability of stock map. Efforts have been made to develop a fully functional GIS as an integral part of working plan exercise, and to train the staff to use the same in collection of data and preparation of reports. This map prepared by using GIS software shows division, range, round, beat, compartment and sub-compartment boundaries & boundary pillars with their numbers. The other important features such as Working Circle, Felling Series, and Coupe Numbers & Site quality (stock map) are also shown on the working Plan maps using GIS software.

5.00 Remote Sensing (RS) data are utilized in Forest Resource assessment and management using GIS and GPS technique in GIS cell of all working plan divisions. Maps prepared in GIS cell have high degree accuracy and are compatible to handle computer data. These techniques are used in working plan divisions to collect, store, retrieve, transfer and to display geographically referenced spatial data with its corresponding attribute information to meet a specific requirement. Various data are stored in the form of different layers. These layers are overlaid and manipulated to generate new information as per our requirement. These layers are useful for working plan map to show details such as Forest density, Forest type, Site Quality, Contours, Soil map, Road network, Encroachments, Volume data, Wild life sighting, Villages, Boundaries, Research plots, Fire affected area, Plantations etc. The remote sensing results are verified for accuracy on the ground at some places. These are done using GPS. GPS instrument helps to precisely locate the points on the ground and compare the remote sensing results on random basis. At some places, Differential Global Positioning System (DGPS) are used for boundary survey and later on transferring the boundaries for updating the maps prepared using remote sensing data & GIS.

6.00 Govt. of India prescribed the National Working Plan Code in 2004, which has drastically increased the sphere of activities in Working Plan divisions in the state. This included preparation of Working Plans of a period of 10 years instead of 20 years, thus doubling the numbers of Working Plans to be prepared. The new Code has also increased the scope of survey and assessment of natural resources to be carried out while preparing the Working Plans. To implement the provisions of National Working Plan Code 2004 and to improve the quality of the

Working Plans, existing Working Plan Divisions have been strengthened by creating independent GIS cells in all the Working Plan Divisions in Maharashtra.

7.00 The GIS cell at Nagpur which is working since 1997-98 at Nagpur has carried out the digitization works of various features necessary for the prescriptions of Working Plans of various Divisions. Till today the digitization work of all the 20 Forest Divisions of Vidarbha Division has been completed and the projects are ready for use including the information of the forest boundaries etc. Besides this, the work of digitization of forest boundaries of 17 Divisions/ Sub-Divisions out of 31 Forest Division/Sub-Divisions of Western Maharashtra & Marathawada Region have been completed till date. The Lists of 37 Divisions/ Sub-Divisions of Vidarbha, Marathawada & Western Maharashtra Regions, where Forest Boundaries have been digitized till date are enclosed as **Annexure No.I**. The list of remaining 14 Divisions/Sub-Divisions of Western Maharashtra & Marathawada Region, where the digitization of forest boundaries are in progress & are likely to be completed by the end of March 2012 is enclosed as **Annexure No. II**.

8.00 GIS maps have been supplied to all concerned forest divisions along with viewer software for Ground truthing by CCF (WP) Pune, so as to finalize these digital maps, which have not been done yet by concerned DCF(T). In case of Wadsa & Buldhana Division, ground truthing of digital maps is yet to be done by DCF (T) Wadsa & Buldhana respectively. For remaining 18 divisions of Vidarbha, ground truthing have been done & digital maps along with viewer software have been supplied to all these divisions.

9.00 Presently GIS software Geo-media Professional 6.0 version is being used to prepare GIS Maps in all the working plan divisions in the state. Besides this, one license of Geo-media Professional 6.1 version has been procured in the office of CCF (WP) Nagpur during the year 2009-10. GIS Training Centre is being established at Nagpur in the office of CCF (WP) Nagpur to impart training course for officials of forest department on application & use of GIS software in forestry & modern technique for preparation of working plan maps. A proposal for procurement of Workstations, Plotters, Scanners, Geo-media Professional 6.1 version along with Geo-media Terrain & Geo-media Grid for this GIS training centre as well as for use in all working plan divisions has been sanctioned for the current year 2011-12 under CAMPA. This GIS Training will be fully operational in the current year 2011-112. This updated GIS facility will be utilized in preparation of digital maps of the respective territorial forest divisions.

Annexure No.I.

S.N.	Vidarbha Region.		S.N.	Western Maharashtra & Marathawada Region		Remarks
	Circle	Division/ Sub-Divisions		Circle	Division/Sub- Divisions	
1	Nagpur	1. Nagpur	1	Pune	1. Pune	In Vidarbha Region all the 20 Forest Division boundaries have been digitized, whereas forest boundaries of 17 Divisions/ Sub-Divisions of Western Maharashtra under the jurisdiction of CCF WP Pune have been completed. Digitization of forest boundaries of remaining 14 Divisions/ Sub-Divisions under the jurisdiction of CCF (WP) Pune are in progress & likely to be completed by the end of March 2012.
		2. Wardha				
		3. Gondia	2	Nashik	3. East Nashik	
		4. Bhandara			4. Ahmednagar	
					5. Sangamner	
2	Amrawati	5. Amrawati	3	Kolhapur	6. Kolhapur	
		6. East Melghat			7. Satara	
		7. West Melghat			8. Sangli	
		8. Buldhana	4	Dhule	9. Dhule	
	10. Nandurbar					
3	Chandrapur	9. Chandrapur			11. Jalgaon	
		10. Bramhapuri			12. Yawal	
		11. Central Chandrapur			13. Mewasi	
4	Gadchiroli	12. Gadchiroli	5	Thane	14. Thane	
		13. Allapalli			15. Roha	
		14. Sironcha			16. Shahpur	
		15. Bhamragad	6	Aurangabad	17. Nanded	
		16. Wadsa				
5	Yeotmal	17. Yeotmal				
		18. Akola				
		19. Pusad				
		20. Pandharkawda				

Note. :- Ground truthing of maps of above 17 divisions for which digital maps have been supplied by CCF(WP) Pune, so as to finalise these digital maps, have not been done yet by concerned DCF(T). In case of Wadsa & Buldhana Division, ground truthing of digital maps is yet to be done by DCF (T) Wadsa & Buldhana respectively. For remaining 18 divisions of Vidarbha, ground truthing have been done & digital maps along with viewer software have been supplied to all these divisions.

Annexure No.II.

S.N.	Name of the Circles & Divisions & Sub-Divisions.	
	Circle	Division
1	Thane	1. Dahanu. 2. Jawahar. 3. Alibagh.
2	Kolhapur	4. Sawantwadi. 5. Ratnagiri.
3	Pune	6. Solapur. 7. Junner.
4	Nashik	8. West Nashik 9. Malegaon
5	Aurangabad	10. Aurangabad. 11. Parbhani. 12. Beed. 13. Osmanabad. 14. Hingoli