A

VISION DOCUMENT AND MANDATES OF

INFORMATION TECHNOLOGY AND
GEOINFORMATICS CENTRE (ITGC)
FOREST DEPARTMENT, GOVERNMENT OF
UTTARAKHAND

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1. INTRODUCTION:

Information and communication technology is an umbrella term that includes the design, development, implementation, support, and management of computer-based information systems. In essence, the application of this technology deals with the use of computers and software to convert, store, protect, process, transmit, and retrieve information. Information is the key for modern-day forest managers. For planning, writing management prescriptions, and forecasting effects of prescriptions, managers need immediate access to data and information that is accurate and meaningful.

Information communication technology (ICT) applications can be harnessed to enhance public participation and transparency, make law enforcement more efficient, and improve forest management. The Geoinformation technology may be extensively used for developing linkages through Information and Communication Technology (ICT), which can lead to public awareness, thus enabling people’s participation in the planning process. Intra and inter organizational linkages are facilitated and better management systems can be developed. Change detection studies can be undertaken, facilitated by satellite data over a time scale.

2. BACKGROUND:

Initially IT CELL was formed to strengthen the forest department in the area of IT sector in 2005-06. In the beginning website creation and its management, LAN, technical support to forest divisions etc. were provided by IT cell.

In 2009 a contract was signed with SCIENCE (a private organization) for GIS and Remote Sensing services. SCIENCE gave its services until March 2013. After that two GIS Analysts were recruited to carry forward the GIS work.

2.1 Following works have been taken up at IT Cell until now:-

1. Departmental Website (www.uttarakhnadforest.org) creation and its management.
2. Digitization of forest boundaries (circle, division, range, beat, block and compartment level) for all territorial forest divisions.
3. Digitization of forest boundaries (circle, division and range level) for all Civil Soyam forest divisions.
4. GIS database of Fire locations in point format for all divisions.
5. Day-to-day support to forest divisions.
6. Digital maps for different projects such as – watershed, GIM, Eco-Sensitive Zone and CAMPA related were provided.
7. Digitized maps to other departments for forest land diversion cases were provided.
8. Digitization work for following features/objects have been completed -
   1. All types of roads (civil and forest)
   2. Railway lines
   3. Drainage / River
   4. Settlement
   5. Forest Rest House
   6. Forest Guard Chowki
   7. Watch Tower
   8. Crew-station
   9. Watershed, Sub-watershed and Micro-watershed
9. **Beat Maps** for the following Divisions have been completed -
   1. Almora Forest Division
   2. CS Almora Forest Division
   3. Garhwal Forest Division
   4. Lansdowne Forest Division
   5. Nainital Forest Division
   6. Nanda Devi Forest Division
   7. Narendranagar Forest Division
   8. Pithoragarh Forest Division
   9. Ramnagar Forest Division
   10. Rudraprayag Forest Division
   11. Champawat Forest Division
   12. Tarai Central Forest Division
   13. Tarai West Forest Division
   14. Tehri Forest Division
   15. Tons Forest Division
   16. Uttarkashi Forest Division
   17. Dehradun Forest Division
   18. S.C. Kalsi Forest Division
   19. Mussoorie Forest Division
   20. Upper Yamuna Barkot Forest Division
   21. Haridwar Forest Division
   22. Bageshwar Forest Division
   (For remaining forest divisions work in progress)
10. GIS data base (Management Map, Stock Map and Working Plan Maps) for the following forest divisions have been completed- 
   1. Dehradun Forest Division
   2. S.C. Kalsi Forest Division
   3. Mussoorie Forest Division
   4. Upper Yamuna Barkot Forest Division
   5. Haridwar Forest Division
   6. Garhwal Forest Division
   7. Bageshwar Forest Division
   8. Champawat Forest Division
   9. Narendranagar Forest Division
   10. Pithoragarh Forest Division
   (For remaining forest divisions work in progress)
11. Mosaic of following layers for entire Uttarakhand have been completed- 
   1. Forest Administrative Boundary up to Compartment Level
   2. Watershed Boundary up to Micro-watershed
   3. Road Network
   4. Drainage / River
   5. Settlement
   6. Forest Rest House

- Forest Cover Map (2009, 2013) and Forest Type Map (2009-10) have been procured from Forest Survey India, Dehradun.
Satellite imageries LISS-III (23.5m resolution) data for 2013 and LISS-IV (5.8m resolution) data for 2011-13 have been procured from NRSC, Hyderabad.
- Bugyal mapping for Uttarakhand state at 1:50,000 scales are being done. Ground verification will be done to assess the accuracy of the work.
- Aster data (30 m resolution) has been downloaded from internet available free of cost from which altitude maps, aspects and slope maps have been generated for entire state.

3. **ROOT CAUSE ANALYSIS (RCA) , as on April, 2015 :-**

IT Cell has been undergoing some rudimentary issues/problems, affecting the overall outcome; these are listed below with possible solutions:

**P1.** IT Cell since its inception has got no proper protocol and framework.

**Solution:**

i) An administrative protocol consisting of IT Cell’s vision, mission, objectives and mandates needs to be finalised.

ii) A proper organizational structure has to be built.

**P2.** Since IT Cell’s inception in 2005-06 no much infrastructure has been developed. Whole IT Cell has been running in a very small room of 4m×8m size, having 7 PCs, 2 workstations, 2 printers and one scanner.

**Solution:** A proper lab for IT and GIS has to be developed consisting of all necessary infrastructures. For this purpose two big size rooms have already been finalized on third floor in new building of UKFD.

**P3.** In the present system IT Cell is headed by CCF (Admin) and DCF (IT & Modernization) supervises the activities.

**Solution:** A proper IT structure has to be developed.

**P4.** DCF-IT & Modernization is the only sectioned post for information technology, but this post has got very little say in prompt decision making. This leads to a chaos where no one interested in taking final decisions and to bear responsibilities.

**Solution:** Therefore, it is an urgent need to strengthen the post of DCF-IT and later to have sectioned post of CF-IT and APCCF-IT.

**P5.** DDO powers are vested with CCF (Admin), but account management work is done by DFO-Dehradun. This leads to a chaotic situation, where no one is aware about his responsibilities, as a consequence no outcome.

**Solution:** It is urgently required to hand over DDO powers to DCF-IT & Modernization.

**P6.** There are two foresters, three forest guards and two GIS analysts in IT- cell. Except two GIS analyst, no one is expert in her profession. Most of the staff is serving here because she/he wants to be stay in Dehradun. In the course of time and through experience they have learnt few skills, but that doesn’t suffice.

**Solution:** Therefore, few professional IT experts have to hire through service providers. In addition an accountant is also required to handle CAMPA account.
IT Cells receives funds from two sources- 1. CAMPA -major funding, 2. State Govt. (Rs. 5 lakhs/annum).

P7. A broad band internet connection of 6 mbps has been installed in IT cell, but due to lack of proper management (no firewall, 70 ports) and control over it, all other offices such as CCF-Garhwal, CCF-Monitoring, CCF-NTFP, CF-Yamuna, and HRD etc. have also been utilizing the opportunity, though they have their own internet facility moreover, these offices receive regular funds for the same. This has resulted in complete sabotage/ subverts of whole system.

Solution: It is urgently required to limit the internet connections and reduce the number of internet ports.

P8. Old website is static one, that has to be upgraded or a new website has to be developed.

P9. Digitized maps of diverted forest land indicating the project area in KML files are being provided by IT cell to other line departments, but this result in over burdening situation.

Solution: It is important to stop this practice and shift this work to land survey directorate.

Following are the ongoing works at IT Cell:

1. Management of current website.
3. Samadhaan
4. CUG
5. ID Card preparation
6. Maps for land transfer cases.
7. Bugyal mapping
8. Trekking routes mapping on Google map
9. BHUVAN MoU
10. Beat map preparation
11. GIS database creation
12. GIS related support to department
13. Development of HRMS application
14. Development of a new dynamic website
15. Fire Alerts
4. PROPOSAL FOR FUTURE STRATEGY OF ITGC:

It aims to introduce modern approaches to information/data management in the department of forest; Govt. of Uttarakhand. This includes technological solutions for information integration, GIS/Remote sensing and mobile technologies and to have a number of subsystems & modules to provide information for steering & managing the forestry sector toward sustainable forest management.

‘IT Cell’ as the name gives the impression of a small unit, though the work of the IT cell is not limited. Therefore keeping in mind the need for expansion, demand and work load, domain IT cell can be changed to “INFORMATION TECHNOLOGY AND GEOINFORMATICS CENTRE (ITGC)”.

As per the guidelines of MoE,F&CC, Govt. Of India, New Delhi all the states should have Geoinformatics Centre; hence this purpose would also be solved.

4.1 MISSION OF ITGC:

“e-governance through implementation of Information communication technology (ICT) and Geoinformatics in the forest department of Uttarakhand according to national & state guidelines/policies.”

4.2 VISION:

“To bring up the comprehensive changes in the functioning of forest department through Information communication technology (ICT) & Geoinformatics.

4.3 GOAL:

“To provide support and back up to forest department in order to ensure transparency, accountability, and public participation in sustainable forest management”.

4.4 OBJECTIVES OF ITGC:

I. Systematically helping in sustainable forest management by systemic collection, storage and retrieval of MIS and Geo-spatial data through a computer based communication network.

II. To assist in development and implementation of updated Forest Management and Conservation Plans.

III. To provide high standard technical support to different forest divisions.

IV. To build and manage an efficient and effective service delivery web portal.
4.5 MANDATES OF ITGC:-

The Information Technology and Geoinformatics Centre (ITGC) of Uttarakhand Forest Department, Dehradun is mandated with the following tasks:

1) To support in decision making of forest department through IT and Geoinformatics infrastructure and
2) Introduction and establishment of latest technology in the fields of communication, electronics, surveillance and Geoinformatics.
3) Maintenance of departmental website along with its content management & development.
4) To develop a web based network for citizen centric services in the form of e-Citizen.
5) To build and enhance IT and Geoinformatic skill capabilities of the forest officials.
6) To develop networking in the form of LAN/WAN, VPN and VC within and between the departments.
7) To digitize the activities of Forest Department of Uttarakhand.
8) Development, Management and Maintenance of departmental Geoinformatics/GIS database and its utilization for development of plans, reports, thematic maps etc.
9) To make Geoinformatics integral to decision making process at all levels in forest department.
10) To keep the database on-line by converting it into Geo Database through intranet and Web based GIS applications such as “BHUVAN” and to assign privileges for creating, updating and exchanging data at different levels throughout the state.
11) To enhance the utility of existing database and generate further reliable data for different wings of the Forest Department, Uttarakhand.
12) To integrate applications of MIS with GIS through development of Forest Management Information System (FMIS) for better development.
13) To provide support for implementation of National and State Government IT & GIS applications.
14) Implementation of IT & GIS based national & state guidelines/policies in the forest department of Uttarakhand.
15) Development of mobile based, user friendly applications (m-Governance).
16) To carry out research and training activities in the field of RS, GIS and ICT in Uttarakhand.
17) To assist departmental wings in satellite based monitoring of different projects.
4.6 CORE FUNCTIONS:

The following are some of the major activities of IT& GC, UKFD:

- Comprehensive Forest Geo-database Creation.
- Forest Mapping & GIS Analysis.
- Development of FMIS applications and provide technical support.
- Density Change & Fire Incidence Monitoring.
- Networking & Communication (intranet portal & LAN based portal).
- Training & Capacity Building in Computing, GIS and Image Interpretation.
- Web-based Forestry Database Management.
- Remote sensing based application i.e.; BHUVAN support to department.
- National & State level policy support.

4.7 PILLARS OF FOREST GOVERNANCE AND TECHNOLOGY:

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<th>Suitable ICT/GIS Applications</th>
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<td>Transparency, Accountability, and Public Participation</td>
<td>E-government and open data initiatives. Advocacy and awareness campaigns through text messaging and internet social networking sites. Collaborative and participatory mapping</td>
<td>Transparency in the forest sector Decentralization, devolution, and public participation in forest management Accountability within and outside the forest department.</td>
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<td>Quality of Forest Administration</td>
<td>Satellite imageries from NRSA. However, technical training to forest officials is essential to interpret images and generate maps. PDAs can be tailored for different uses: tracking wildlife, movement of logs, location of specific tree species, etc. It is a good technology for working in collaboration with communities.</td>
<td>Willingness to address forest sector issues. Forest cover and carbon stock assessment with Real-time fire alerts through MODIS. Forest monitoring and evaluation. Management of conflict over forest resources. Wildlife tracking and conflict management through mobile phone applications interpret images and generate maps.</td>
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<td>Coherence of Forest Legislation and Rule of Law</td>
<td>Technologies for surveillance and deterrence: computerized checkpoints and GPS tracking of vehicles Technologies for tracking timber—chain of custody systems Legal information management</td>
<td>Quality of domestic forest legislation Quality of forest law enforcement</td>
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<td>Economic Efficiency, and Incentives</td>
<td>Online LISA and timber sales, licenses, and auctions. Logistics. Initially, some services such as online auctions of Resin, Timber and for other NTFPs.</td>
<td>Maintenance of ecosystem integrity—sustainable forest use Incentives for sustainable use and penalties for violations. Forest products pricing Commercial timber trade and forest businesses Equitable allocation of forest benefits Market institutions Forest revenues and expenditures</td>
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<td>Management with proper planning</td>
<td>GIS and Remote Sensing</td>
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### 4.8 PROPOSED ORGANOGRAM:

![Proposed Organogram](image-url)
4.9 ROLES & DUTIES OF IT & GC PERSONNEL -

1. **PCCF (HoFF):** APCCF (ITGC) will finally report to PCCF, who is the head of forest force.

2. **APCCF (ITGC):** At present APCCF (Admin) is looking after IT Cell but in future APCCF (ITGC) post has to be created who will be the over all in-charge of all the activities of IT GC.

3. **CF (ITGC):** CF (ITGC) has to report APCCF (ITGC) for all the activities of ITGC.

4. **DCF (ITGC):** DCF (ITGC) handles the actual management of ITGC. All the activities have to be monitored by the DCF (ITGC). He/she would act as a main functional unit/division. DDO power would rest with DCF (ITGC).

5. **SDO:** At present the post is vacant and in near future it can be considered for proper functioning of the unit.

6. **Ranger:** At present the post is vacant and in near future it least two post of RANGER-IT & Geoinformatics can be considered for proper functioning of the unit.

7. **Forester:** There are 2 foresters in ITGC, One is working on Website maintenance another is working on Samadhan, CUG, Store and providing networking and h/w, s/w solutions. Therefore in near future three more forester level post are needed one for IT, one for GIS and one for training & support branch.

8. **Forest Guards:** 3 forest guards are working on Land transfer cases, GIS mapping, I-Card preparations, and letter typing. Also providing services for networking, h/w, s/w, all the technical supports required at the time of meetings in Manthan Sabhagar. Here at least three more forest guard post are further needed to fulfil the augmented requirement of IT, Geoinformatics and training & support branch. This staff lacks professional competency, hence more training and recruitment of new staff is needed.

9. **GIS Analysts:** There are two GIS Analysts on contractual basis who are well versatile in their fields of GIS, GPS and Remote Sensing. All the GIS Maps, Remote Sensing Studies are being carried out by both of them. All the trainings regarding GIS portals such as e-Greenwatch, GPS and Remote Sensing activities are provided by them to the field staff any time on demand. For these staff further skill development can be done.

Note 1: As the new working plan code encompasses many GIS based applications, similarly the GIS based monitoring have to be carried out for the projects such as CAT plan and JICA, therefore, it is necessary to keep a full time GIS Analyst exclusively for these works.
10. **System Analyst and Database Analysts:** Presently, we have hired a programmer through NIC for the development of FMIS and HRMS. In the near future, other software applications and modules such as plantation, wildlife management, eco-tourism, e-booking, e-Auctioning, Forest Protection Management System (FPMS), nursery stock management etc. have to be developed. Therefore, it is necessary to appoint/hire at least two data base analysts and one system analyst through a service provider agency/consultancy according to prescribed rules.

5 **INFORMATION TECHNOLOGY AND GEOINFORMATICS CENTRE (ITGC) BRANCHES:**

ITGC would have the following branches as per the work specifications:

A. **Information Communication Technology (ICT) Branch:** This branch would be engaged in ICT-innovation i.e.: website management, ICT applications, CUG etc.

B. **Geoinformatics Branch:** This branch would carry out the works related to GIS & RS technology.

C. **Training & Support Branch:** This branch would be engaged in dissemination of technology within and outside the department.

Major Activities of each branch are as follows:

5.1 **INFORMATION COMMUNICATION TECHNOLOGY (ICT) BRANCH:**

ICT branch will look after all the ICT related activities such as
5.2 ONGOING PROJECTS IN INFORMATION COMMUNICATION TECHNOLOGY (ICT) BRANCH:

FMIS:-

Forest Management Information System (FMIS) for the Forest Department, Uttarakhand aims to introduce modern approaches to information management in the department. This includes technological solutions for information integration, remote-sensing technologies, and mobile technologies. FMIS will contain a number of sub-systems and modules to provide information for steering and managing the forestry sector toward sustainable forest management. The FMIS information strategy will also guide the Forest Department, Uttarakhand in aligning IT investment in other development projects to obtain a harmonized, cost-effective system.

FMIS is expected to reduce the fragmentation of information by harmonizing standards within and between the departments.

An interface to Forest Management Information System (FMIS) has already been in progress and would soon be completed. For this purpose a hosting facility is being created, with the help of ICFRE-data centre. They have agreed to provide us a storage/hosting facility. Therefore it is necessary to convert our website into a dynamic one, for which we have already in progress. After which several software based modules such as HRMS, FFMIS, FOMS, Wildlife Management System etc. would be created as follow:-

1. Website Maintenance: Present website of Uttarakhand Forest Department (www.forest.uk.gov.in) is Static and out dated, hence a new responsive dynamic website, that can adapt their content or appearance depending on the user’s interactions, changes or customizes itself frequently and automatically, which has been designed primarily for two purposes- to inform the citizen about the Department and its activities and also to act as a knowledge portal where from officers of the Department and others could download information like tender, notices, public appeals, all departmental updates and news etc.

The website contains various important modules in a systemic way as:-

Main Menu contains-

1. Forest (it contains basic information related to UKFD and Forest Management and about all Forest Divisions),
2. Wildlife (it has all the required data/information related to PA)
3. Schemes/Budget (it has all schemes, projects etc.),
4. Research & Training,
5. E-citizen (it contains all the public related information such as-RTI, Citizen Charter, PA, Forest area, FCA clearances, Tender, Publications, Forest resources, Forest based industries, Forms/Applications, FAQ, feedback, Contact us etc.)
6. Eco-tourism Information related to FRH and Trek routes
7. Contact directory (it contains complete data base of UKFD).

Mid Content has:-
A. Archive (it has all the downloadable data/main data storage and uploads data)
B. Wings of Uttarakhand forest department (it contains information related to all the wings of UKFD)
C. Tourist information (it contains all the necessary information related to our forest divisions/WLS/PA/TR/NP) etc.

5.3 GATEWAY TO APPLICATIONS –
It contains all the MIS based modules in the 3 main headings namely-
A. Departmental Portal:- “2” sub- headings 1. FMIS 2. GMS
   It contains all the departmental software based modules such as HRMS, FFMS, FOMS, ID-Card etc., GMS has BHUVAN satellite based management data and other modules.
   A login is also being provided for departmental purposes.
B. Public Portal: - It contains other MIS based modules such as e-Greenwatch, FCA-Clearances, WCCB, Samadhaan etc.
   Main related external linkages shall also be provided.

5.4 Following Works can be done in near future by Information Communication Technology branch:
1. Networking all the offices to ensure centralized storage of documents, data and Hardware/Software resources.
2. To provide website and application hosting facilities for Uttarakhand, at ICFRE data centre, Dehradun.
3. WAN/VPN implementation in department: All forest offices are connected to BSNL broad band; hence VPN can easily be implemented.
4. Inter department online information sharing system. In this development all informational and statistical data will be transferred and shared by each division.
5. Forest Finance Management System (FFMS): All accounting details are integrated in these systems like file records, expenses, ledgers etc. One platform for all type of accounting needs.
6. Video Conference: In this module we will cover video conference FROM PCCF to DFO level.
7. Forest Protection Management System: In this module, field staff will handle e-challan, e-case, e-rammna, and other on spot activities like details of vehicles passed
by each forest check post. All data is also integrated with satellite mapping for instant real information with its physical location.

8. **e-office:** In this module all written communications and official letters are now converted to digital media. This module covers all letters and orders from range level to PCCF level or vice versa.

9. **Court Case Management System:** All cases that are handled by divisional officer now handle by electronically.

10. **e-Van Panchayat:** In this module all forest development work done by van panchayat of Uttrakahnd will be computerized.

11. **e-Forest Learning:** In this module we will develop learning and training program system like e-classes, video-classes for Forest Officers. BY this system we wish to develop newly high-tech FORST officers.

12. **Forest Wide Area Network:** In this module we have to connect all offices from PCCF to Ranger level through wide area network (WAN) for fast connectivity among all the offices and between departments.

   1MB dedicated bandwidth for Range Office,
   2MB for DFO and CF level,
   4MB at CCF level and 100 MB at PCCF level.

13. **Vehicle Management System:** E-log book, E-maintenance of all vehicles of the department and connecting all vehicles from range level to PCCF level would be connected with GPS for fast and accurate moving of vehicles.

### 6. GEOINFORMATICS BRANCH:

Geoinformation technology is an emergent and fast-growing technology with immense potential to overcome hurdles related to the planning process. Geoinformation when coupled with conventional methods of ground validations can be a useful instrument of efficient planning. High Resolution Satellite data are an extremely important source of producing large-scale maps especially in countries like India where use of Aerial Photographs is restricted due to high cost and security reasons.

The advantages of using Geoinformation technology are numerous, conversion of analogue spatial data into digital data, being one of the many. Digital data can facilitate effective and efficient handling and enhance the analytical capability of the database. It can also facilitate storage, retrieval and dissemination of datasets, which presently is a cumbersome task in forestry. Spatial and non-spatial data processing is more accurate and easier in the digital domain.
A concise data base of Uttarakhand forest has been developed with the help of SoI, Dehradun. Thus, now we have up to date and complete GIS data base in WGS-84 projection system at 1:50,000 scale.

We are also in the process of uploading departmental GIS portal on BHUVAN.

GIS and Remote Sensing activities for mapping and analysis:-

1. **Forest Cover Change Monitoring**: Forest cover change is being monitored based on FSI data and division wise maps and reports are prepared and provided to forest divisions for necessary follow up action.

2. Fresh satellite imageries such as LISS-III and LISS- IV data are being procured from NRSC, Hyderabad.

3. **Digital Map**: Stock Map / Management Map / Beat Map / Range Map and many such special category maps are being produced and distributed to field staffs.
6.1 ONGOING PROJECTS GEOINFORMATICS BRANCH:

1. **Working Plan Mapping:** Digitization, Analysis and Map Composition of Management maps, working plan map, stock map, Enumeration map, Man-Animal conflict map, Division map, Sub division map, Range Map & Beat maps. Map composition for First WPR in A4 size as Reference map, Division map, Road map, Drainage, Point location, Block map, Fire Sensitive Zone, Encroachment Sensitive Zone, Lantana infested area map, Aspect, Slope, DEM, Forest Barrier, Crew station, FRH, Forest Guard Chowki, Police Station, Forest type, Geology, Illicit Felling, PB Map, Density Map, FDA, JFM, Resin Tapping, Quality Class Map, Satellite image map, Rich Biodiversity map, Control burning, Micro watershed, Nursery, Soil erosion, watch Tower, Water resources, Plantation map.

2. **Bugyal Mapping:** For the first time in India this work is being done. In which Digitisation and classification of Bugyals of Himalayan (Uttarakhand state) as per the methodology. Tree line has been delineated for Uttarakhand state at 1:5000 scales.

3. **Land Transfer:** All the land transfer related maps are being generated in GIS format at IT cell and provided to user agency as per their demand. FTI is also doing the same work for Kumaun zone from now and all the files have been transferred to FTI Haldwani. Actually it is not the mandate of ITGC therefore it is proposed to transfer this work to Land transfer office.

4. **Mapping for Division:** All the maps starting from Circle, Division, Range, Beat etc showing different information overlaid on administrative forest boundary are being composed and get printed as per the requirement depending upon the projects like JICA, CAT Plan, e-Greenwatch and Division officials. Maps are updated, modified composed as and when required.

5. **Digitisation & Analysis:** Forest Density, Micro watershed, Aspect, Slope, Altitude and all the other information related to divisions, particular Forest Type, Species distribution etc., are analysed and digitised as and when required.

6. Digitization of all the Forest Rest Houses and their approach roads and trek routes for entire state.
6.2. **Following works can be done in near future by geoinformatics branch:**

1. **Forest Fire associated damage assessment:** After completion of each forest fire season with the help of standard remote sensing based methodology the damage to the forests in terms of area can be assessed which will further be used for policy decisions.

2. Establishment of advance **forest fire danger alarm system**.

3. **Working Plan Maps:** As per the new working plan code-2014 all the maps has to be composed at ITGC.

4. **Forest Atlas of Uttarakhand:** Uttarakhand state doesn’t have any forest related atlas where at a glance all the statistics and maps can have a look. Therefore it is proposed to make a forest atlas with all the existing database of GIS.

5. **Lantana Mapping:** With the help of remote sensing data and analysis of all Lantana affected the locations can be mapped and monitored.

6. **Plantation Monitoring:** Remote sensing based monitoring of the plantation area under different schemes.

7. **Encroachment Mapping:** It is important to identify of forest encroachment and removal of forest encroachers. For this GIS and RS applications would be used to map the encroached areas of the forest department.

8. **Decision Support System:** An online GIS server based system is proposed to be developed in such a way that each level users can access the GIS Maps and data for the statistical calculation analysis, viewing and mapping purposes depending upon the grants provided to each level user.

9. **Mapping of rare species** of Uttarakhand such as Tansen, Thuner, Kafal, Deodar, Tejpat, Sal, Banj etc.,

10. **Mapping of Sacred Grooves** of Uttarakhand

11. Wildlife species wise **Man-Animal conflict regions mapping**

12. Major **Trekking routes mapping**

7. **TRAINING & SUPPORT BRANCH:**

   Front line staffs / officers are being regularly trained in the areas of application of e-greenwatch / GPS and internet in forest management. IFS and SFS officers are regularly trained in GIS/GPS application in forestry. Forest rangers and other front line staffs are also being trained in modern technologies. Draftsmen are also being trained in GIS and Cartography.

   **Current training / workshops:-**

   E-Greenwatch portal, GPS, IT tools etc. along with the following other activities

   a. A customised **GPS Training.**
b. Workshops on e-Greenwatch, WCCB etc.,

c. LAN/WAN: Networking related issues within campus.

d. **Hardware and Software support:** Purchase and repair works.

e. **Technical Support:** Website related works: e-tendering, e-auctioning etc.

f. **I Card:** To support UKFD in meeting smart ID-Cards.

g. **Samadhaan:** All complains uploaded on web portal of Samadhan (samadhan.uk.gov.in) related to the services are being sorted out by making communication with the concern officer. Also uploaded the sorted out information on the portal within 30 days.

h. **CUG:** The entire bill related activities.

i. **Projects & Programmes:**
   a. **CAT Plan:** Monitoring using GIS & RS technologies
   b. **JICA:** Monitoring using GIS & RS technologies

**7.1. Future works to done by Training and Support branch:**

**7.2 Training modules proposed to be taught in the training:**

**A. Basic Computer** - Total Modules: 3

1. **Introduction to Computer**
   1.1. Introduction to Computer –Basic practical knowledge of computer and internet

**B. Fundamental of RS & GIS Technology** - Total Modules: 3

1. **Introduction to GPS**
   1.1. Introduction to GPS
   1.2. Hands on activity & field visit
   1.3. Downloading of GPS data in computer
   1.4. Google Earth & GPS

2. **Introduction to Remote Sensing**
   2.1 Remote sensing platforms and Sensors.
   2.2 Data collection and storage.
   2.3 Available datasets and their uses: topographic, Images, multispectral
   2.4 Data visualization and interpretation
   2.5 Digital Data processing (Georeferencing and Rectification)
   2.6 Data analysis

3. **Introduction to GIS**
   3.1 Basic Concepts of GIS
   3.2 Introduction to Cartography : Map projections and coordinate systems
   3.3 Geographic data and maps
   3.4 GIS Data analysis
   3.5 Remote sensing and GIS applications
   3.6 GIS Mapping with GIS software
   3.7 Map template designing and map composition
   3.8 Exercise on GIS application live project
• Major Trekking routes mapping

C. TRAINING&T SUPPORT BARNCH :-

To provide training and to conduct workshops on-
E-green watch portal, WCCB software, FMIS, GPS, IT tools etc.

URGENT REQUIREMENTS as on 27.03.2015:-

• Security audit of departmental website.
• To enable our internet networking and website with Cyber security system.
• H/W up-gradation: Monitors, UPS, RAM, Networking wire etc.
• Latest SOI toposheets
• Village Boundaries
• Meteorological Data
• Soil Map
• Software upgradation and Procurement of ArcGIS & ERDAS
• Know-how of working from other states, through visits
• Training to Staff of the IT&GC
• A typist from the field in the rank of Forest guard or so on transfer basis
• One Forester for GIS/ IT related works
• System Manager and Database Administrator one each for programming and website
  management
• At present there is no office assistant in the centre therefore it is proposed to have one
  office assistant for daily day to day assistance.
• Transfer of posts for existing staff in IT Cell.

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[Signature and Stamp]

Principal Chief Conservator of Forests
Uttarakhand.