

Telangana State of Forest Report 2015

Telangana Forest Department

Government of Telangana, Hyderabad



To the Indian Forest Service

You are the quiet men who do not boast
Although you've done much more than most
To make this land a sea of green
From here, to far Cape Comorin.
Without some help to Nature's thrust.
Our land would be a bowl of dust;
For land which has no forest wealth
Most suffer in its natural health.
As herbs and plants all need green cover
Before they help the sick recover.
And we need trees to hold together
Beasts and 'birds' of every feather;
And leaves, so that the air stays sweet
All this and more is no mean feat.

Dear foresters,
You have not toiled for fame or favour.
Yours has been a love of labour.
Our thanks! Instead of desert sand
You've given us this green and growing land.

Ruskin Bond

10th April 2004
Mussorie

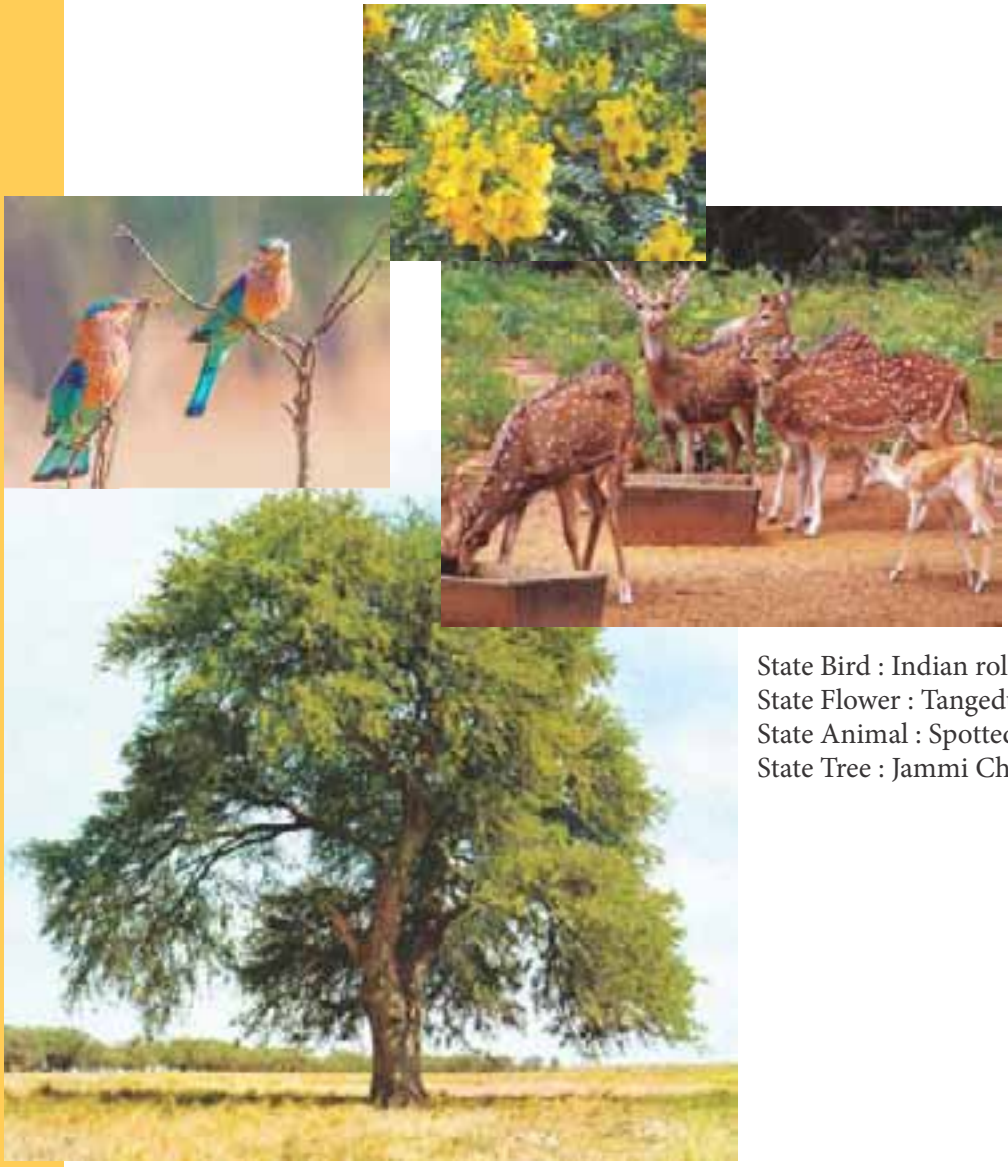
Dedicated this poem to all the Foresters
on the occasion of the release of his book 'The India I Love'
at Indira Gandhi National Forest Academy, Dehradun



Telangana State of Forest Report 2015

Telangana Forest Department

Government of Telangana, Hyderabad



State Bird : Indian roller (*Palapitta)*
State Flower : Tangedu (*Cassia auriculata*)
State Animal : Spotted Deer (*Axis axis*)
State Tree : Jammi Chettu (*Prosopis cineraria*)

Telangana State of Forest Report 2015

Copyright © Telangana Forest Department, Hyderabad

Telangana Forest Department
Aranya Bhavan, Saifabad, Hyderabad 500 004.
Tel: 040 23231774, 040- 23231775
email: apccf_itwp_tsfd@telangana.gov.in dcf_fca_tsfd@telangana.gov.in
Website: www.forests.telangana.gov.in www.tgfdgis.com www.tgfmis.com

Designed and produced by Supriya Bhalerao of Booksline, *Publishing for a better life*, Unit of SRAS foundation
A-502, Maheshwari Towers, Road 1, Banjara Hills, Hyderabad 500 034.
Ph: 040 6661 8506, 98490 08016, 98661 08574. Email: supriyabhale9@gmail.com sras.booksline@gmail.com



Message

It is a matter of great satisfaction and pleasure to know that Telangana State Forest Department is bringing out its Second Annual **Telangana State of Forest Report 2015**, detailing the changes in Forest canopy cover between 2012 & 2013 based on the interpretation of Satellite Imagery, using modern tools of Information Technology and Geomatics. This will enable the State in planning appropriate strategies for effective protection and development of forests and wildlife.

Forests play an important role in developing the livelihood of Rural and tribal community. Forests also play an important role in maintaining, ecological balance including reduction of soil erosion, recharge of ground water and maintaining of fertility of agricultural land. Government of Telangana has accorded top most priority to the protection of forests and wildlife in the state and is committed to bring **33%** of the geographical area under tree cover, in tune with the **National Forest Policy** in next 3 years. To achieve this objective, Government of Telangana has launched programme of massive afforestation and rejuvenation of forests, the **"Telangana Ku Haritha Haram"** (TKHH).

Global concerns are being expressed in different fora World over to protect and expand our green cover to mitigate the climate change. Conservation and Development of Forests will provide **food security, water security and health security to the mankind.**

I hope that facts and figures brought out in this Report will make the people as well as planners to take a firm resolve to work in unison for Conservation and Development of Forest and Wildlife. This will lead to the development of State of Telangana **in harmony with Environment, Forest & Wildlife and as the most Green State in the Union of India.**

I congratulate **Sri P.K. Sharma, IFS**, the Prl. Chief Conservator of Forests (HoFF) and his team of Officers & Staff of IT Wing of his Office in bringing out this excellent Report.

Date: May 16, 2016
Hyderabad

Sri K. Chandrashekar Rao
Hon'ble Chief Minister of Telangana





Message

It gives me immense pleasure that the Telangana State Forest Department has done assessment of Forests and prepared the **"Telangana State of Forest Report 2015"** showing details of forest cover changes between 2012 & 2013 using Satellite remote sensing data. It will only act as guide to Forest Officers in forest protection and development of forests canopy cover on the State but also help in planning and implementation of the prestigious **'Telangana Ku Haritha haram'** (TKHH) programme for greening of the state.

It is the key and important to assess the location wise changes in the forest cover to analyze the impact of biotic pressure and various developmental programmers and to formulate appropriate strategies for better protection and management of forest resources which is critical for human existence and survival of other living being. The forest and wildlife are national assets and need to be protected and conserved for future generations.

Telangana State is traditionally known for rich forests and wildlife resources with **26904 Km^2** of notified forests covering **24.00%** of the geographical area of the State. The State has a strong protected area network with 9 wildlife Sanctuaries and 3 National Parks covering **5856 Km^2** of the forest area with unique ecosystem and bio-diversity. I am sure this second Annual Report will help one and all in the effective protection and management of our forests and wild life resources.

I Compliment **Sri P. K. Sharma, IFS**, the Prl. Chief Conservator of Forests (HoFF) and his dedicated team of Officers for bringing out his "Mirror" of the Telangana forests. The hard work done by IT wing of Telangana Forest Department is commendable and appreciated.

Date: May 16, 2016
Hyderabad

Jogu Ramanna
Minister of Forest, Environment,
Science & Technology
Goverment of Telanaga





Message

The natural forests of Telangana harbour several Protected Areas and are hotspots of Biodiversity. Forests contribute significantly to the improvement of the ecosystem and provide food, fodder, fuel etc. to the living beings, especially to the weaker section of the society living the fringe of the forests. Hence forests are considered to be a great boon to the humanity.

The Department has got a well-established Geomatics Laboratory and well trained GIS personnel. It is heartening to learn that the Telangana Forest Department is utilizing the technical outputs generated by Geomatics centre in protection and intensive management of natural forests by way of identification of suitable sites for plantations, water harvesting structures, habitat management and control of forests fire etc.

I am confident that the second 'Telangana State of Forest Report 2015' bringing out details of changes in the forest cover will be immensely useful in planning the forestry activities leading to development of Forest and Wildlife in holistic manner in the State of Telangana.

I compliment Sri P.K. Sharma, IFS, Prl. Chief Conservator of Forests (HoFF) and the Officers and the staff of IT wing for bringing out this excellent Report.

Date: May 16, 2016
Hyderabad

Vikas Raj, IAS
Secretary to Government
Environment, Forests, Science &
Technology, Government of Telangana





Preface

Telangana has **26903 Km^2** of recorded forests, mostly Deciduous and Thorny, forests apart from few patches of mangroves. They constitute 24% of the geographic area of the State. It is very crucial to preserve the existing cover and make the scrub as well as blank areas green by afforestation. The IT Wing of Telangana Forest Department is entrusted the work of monitoring the forest cover of State inside notified areas every year using satellite technology. The job involves collection of satellite data (LISS III) from NRSC; their Geo-referencing, classifying, determining change areas and their ground truthing and preparing the report. The change polygons are sent to field officers in MIS package developed and feedback is taken online. The disputed polygons are ground checked by the scientists before the report is generated.

This is the second annual report and is highly exhaustive. In this report, the canopy cover is re-assessed for few districts using LISS IV data of 2011-2014 to remove the errors which had crept in due to interpretation using LISS III data owing to its limitations and also due to different interpretation method adopted in earlier reports. It gives details of encroachments, diverted areas, areas where fellings have taken place for planting and areas where greenery has developed, by comparing 2012 (Oct- Dec) image with 2013 (Oct- Dec) image. The work is technical and tedious and the report is tested and so highly reliable. I congratulate the entire team led by Sri Prudhvi Raju, IFS, APCCF (IT&WP) who had laboured hard to bring out this annual report in a professional manner.

The book has 8 main chapters as follows:

Chapter –I deals with the introduction wherein a brief about Telangana Forests and activities of Geomatics wing are presented.
Chapter – II deals with the satellite data used and the procedure adopted limitations of technology, the accuracy aspects and summary of the cost of generation of the TSFR 2015.
Chapter – III deals with State wide results and the extent of various forest canopy cover classes in various divisions, VSS areas, protected areas (PAs) and a brief analysis of changes between 2012 end & 2013 end.
Chapter –IV lists the Forest Division wise changes in forest canopy cover between various classes up to Beat level.
Chapter – V deals with forest canopy cover change statistics in protected areas.
Chapter –VI deals with forest canopy cover change statistics in joint Forest Management or VSS areas.
Chapter – VII deals with details of Forest Fires occurring in Telangana.
Chapter – VIII deals with details of Forest resources outside notified forests in Telangana
The report is scientifically brought out. Enough care has been taken for its accuracy. Hope the practicing foresters, wild life and environment lovers and planners shall benefit from the report.

Date: May 16, 2016
Hyderabad

P.K. Sharma, IFS
Prl. Chief Conservator of Forests
(HoFF)





Acknowledgements

Bringing out the second State of Forest Report for Telangana includes identification and mapping of location specific Forest Cover Changes, both positive and negative, between 2012 and 2013 using the LISS III Imagery which is a herculean task. This could be made possible because of work with full dedication and perseverance by the officers and staff of Geomatics Cell and cooperation and support from all the Officers and Staff of Telangana State Forest Department (TSFD).

I gratefully acknowledge the guidance and encouragement given by **Sri P.K. Sharma, IFS, PCCF (HoFF)** in bringing out the **Telangana State of Forest Report 2015**. He has himself gone through the manuscript, carried out the corrections and gave suggestions for its improvement.

I express my gratitude and regards to **Sri M.Prudhvi Raju, IFS, APCCF (WL)**, & the then APCCF (IT&WP) for his guidance, monitoring and encouragement in all activities starting from procurement of Satellite data till finalizing the changes and receiving the feedback. His guidance helped in analysis of feedback.

I sincerely acknowledge the contribution of **Sri P. Sreenivasa Rao, DCF(IT)**, in all activities starting from procurement of Satellite data till finalizing the changes and receiving the feedback and also in guiding Project Scientists in image processing and analysis, change polygonisation and also in ground truthing, correcting, obtaining feedback, analysis & compiling the results and in preparation of the manuscript, carrying out the corrections and helping in finalizing the report.

I also acknowledge the contribution of GIS Project Scientists namely Sri M. Rajeshwar Reddy, Sri B. Ramakrishna, Sri K. Bhaskar, Sri K. Rajashekar Reddy, Smt A.I. Sheeba, Smt D. Kavitha, Miss K. Sravani, Smt. Mounika, Sri Krishna Prasad, Sri Vamshi, Smt. Deepthi who had worked hard in Image Processing & Analysis, ground truthing, correction, and compilation of the report. Their sincere contribution is highly appreciated. Contribution of MIS Project Scientists namely Sri Srikanth and Sri Prasad in providing the reports on Forest Cover Changes from FMIS is sincerely acknowledged. This facilitated in speeding up the work.

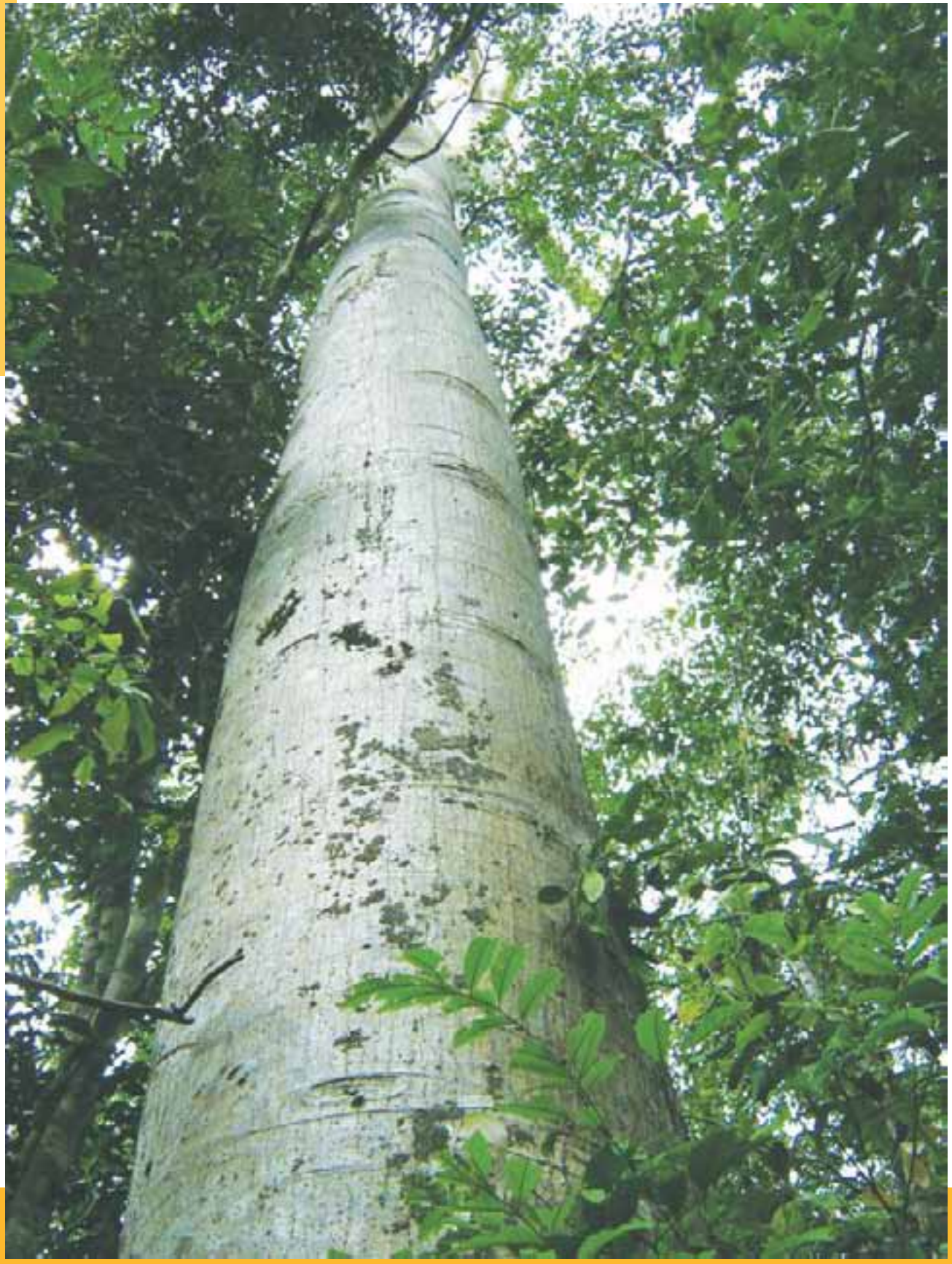
Contributions from all the field officers of the Department from Circle Heads to ABOs are highly acknowledged for Ground Checking of the change areas and furnishing of feedback without which achieving high level accuracy wouldn't have been possible.

Last but not the least, I do acknowledge the valuable contributions and suggestions of all the officers and colleagues and other staff in head office, in bringing out this report.

Date: May 16, 2016
Hyderabad

Sunil Kumar Gupta, IFS, APCCF (IT & WP)
Telangana State Forest Department
Government of Telangana





Contents:



Executive Summary ...1



Introduction ...3



Methodology ...7



State-wise results & analysis ...11



Forest Division-wise results ...17



Forest cover statistics in protected areas ...119



Forest cover statistics in joint forest management areas ...122



Forest fires in Telangana state ...125



Assessment of Trees outside the notified Forests (TOF) ...131



Glossary of Technical Terms ...142



Abbreviations

AE - Allowable Error
AVI - Advanced Vegetation Index
AOI - Area of Interest
AWiFS - Advanced Wide Field Sensor
BIL - Band Interleaved by Line
BIP - Band Interleaved by Pixel
BSQ - Band Sequential
CAD - Computer Assisted Design
CBD - Convention on Biodiversity
CFM - Community Forest Management
CI - Confidence Interval
CV - Coefficient of Variation
DBMS - Database Management System
DEM - Digital Elevation Model
DGPS - Differential Global Positioning System
DIP - Digital Image Processing
DN - Digital Number
DOS - Disk Operating System
DPI - Dots Per Inch
DTM - Digital Terrain Model (or Modeling)
EMR - Electromagnetic Radiation
ESRI - Environmental Systems Research Institute
ERDAS - Earth Resources Data Analysis System
ETM - Enhanced Thematic Mapper
EVI - Enhanced Vegetation Index
FAO - Food & Agriculture Organization
FCC - False Color Composite
FOV - Field Of View
GCP - Ground Control Points
GIS - Geographic(al) Information System(s)
GNSS - Global Navigation Satellite System
GPS - Global Positioning System(s)
GSDI - Global Spatial Data Infrastructure
HDOP - Horizontal Dilution of Precision
IFOV - Instantaneous Field Of View
IRS - Indian Remote Sensing Satellite
JFPC - Joint Forest Protection Committee
LAI - Leaf Area Index
LCC - Lambert Conformal Conic (projection)
LISS - Linear Imaging Self Scanner
LULC - Landuse / Landcover
MDF - Moderately Dense Forest (In terms of Canopy Cover)
MODIS - Moderate Resolution Imaging Spectroradiometer
MSS - Multi-Spectral Scanner
NAD - North American Datum
NASA - National Aeronautics and Space Administration
NDVI - Normalized Difference Vegetation Index
NDWI - Normalized Difference Water Index
NF - Non-Forest
NRCAN - Natural Resources Canada
NRSC - National Remote Sensing Centre
NIR - Near Infrared
NSDI - National Spatial Data Infrastructure
OF - Open Forest (in terms of Canopy Cover)
PDOP - Position Dilution Of Precision
PA - Protected Area
PAR - Photosynthetically Active Radiation
PCA - Principal Component Analysis
PF - Protected Forest
PPS - Precise Positioning Service
PVI - Perpendicular Vegetation Index
RADAR - Radio-wave Detection and Ranging
RAR - Real Aperture Radar
RDBMS - Relational Database Management System
RF - Reserved Forest
RGB - Red, Green, Blue Colour Space
RS - Remote Sensing
RTK - Real-Time Kinematic
SAR - Synthetic Aperture Radar
SAVI - Soil Adjusted Vegetation Index
SD - Standard Deviation
SLAR - Side-Looking Airborne Radar
SNR - S/N Signal to Noise Ratio
SPS - Standard Positioning Service
SRTM - Shuttle Radar Topography Mission
SWIR - Shortwave Infrared
TIR - Thermal Infrared
TM - Thematic Mapper
TSAVI - Transformed Soil Adjusted Vegetation Index
TVI - Transformed Vegetation Index
UTM - Universal Transverse Mercator
VDF - Very Dense Forest (in terms of Canopy cover)
VI - Vegetation Indices
VSS - Vana Samrakshana Samithi(es)
WGS - World Geodetic System
WHS - Water Harvesting Structures

Executive Summary

'The Telangana State of Forest Report' gives a detailed view of the health of the notified Forests in the State of Telangana on annual basis. The **'Telangana State Forest Report 2015'** is the second report after formation of the new State. It gives precise locations of the forest cover changes assessed using LISS- III data of 2012 & 2013 seasons up to Compartment level. It shows the positive as well as negative changes in forest cover inside the notified forests during the above period. All the change polygons have been ground truthed through field officers, which gives high degree of authenticity to the results. **The following are the key results of this assessment:**

A. FOREST COVER INSIDE THE NOTIFIED FORESTS:

a. Notified forest area of **the State is 26903.70 Km^2**. Forest cover based upon the interpretation of the LISS-III data of 2013 and LISS-IV data of 2011-2014 inside the notified forests is **16504.33 Km^2**. It is **61.34 %** of the notified forest area and **14.72 %** of the Geographical Area of the State.

b. The Forest cover comprises of **286.66 Km^2** of Very Dense Forests (VDF), **7789.48 Km^2** of Moderately Dense Forests (MDF) & **8428.19 Km^2** of Open Forests (OF) in 2013. The errors crept due to limitations of LISS-III data and interpretations are corrected; and the deduction shall not be counted towards degradation of forest cover between 2012 and 2013.

B. CHANGE IN FOREST COVER:

i. Positive change:

a. When compared to Forest coverof 2012, there is **Positive change in the forest cover** in an extent of **11.74 Km^2**. There is a positive change in the Scrub as well of **15.84 Km^2**. Hence the total positive change is noticed in an area of **27.58 Km^2**. Improvement is noticed in **2.40 Km^2** of natural forests, **23.42 Km^2** in plantations and **1.76 Km^2** of old abandoned cultivated or "Podu" areas.

b. Of the total positive change of **27.58 Km^2**, an extent of **0.35 Km^2** of Scrub has improved to MDF, **7.49 Km^2** of Non-Forest has improved to Open Forest, **3.90 Km^2** of Scrub has improved to Open Forest and **15.84 Km^2** of Non Forest has improved to Scrub.

ii. Negative change:

a. In comparison to the Forest cover in 2012, there is a Negative change in an extent of **46.59 Km^2** in 2013. The negative change in Scrub forests is **16.21 Km^2**. The total negative change between 2012 & 2013 inside the notified forests is **62.80 Km^2**.

b. Of the above, an extent of **9.76 Km^2** of MDF, **24.81 Km^2** of **OF** and **16.21 Km^2** of scrub has changed to non-forests; and **6.39 Km^2** of MDF and **5.63 Km^2** of Open Forests to Scrub.

iii. Net change:

a. Taking into consideration the positive and negative changes during the period, the net loss in forest cover is **15.80 Km^2** in MDF and **19.05 Km^2** in open forest.

iv. Reasons for change:

a. Of the total negative change of **62.80 Km^2**, **25.38 Km^2** is due to clearance of jungle growth for raising of plantations, **7.34 Km^2** due to harvesting of matured plantations, **1.01 Km^2** due to

diversion of forest land for non-forestry purposes and **29.07 Km²** on account of fresh encroachments.

b. As negative changes due to clearance of jungle growth for raising of plantations and harvesting of plantations are management interventions, these are not counted towards reduction in forest cover. Hence, only the loss on account of encroachments is counted towards the net loss of forest cover, which comes to **29.07 Km²**.

v. Circle, Division & special area wise Change analysis:

a. Khammam Circle accounts for most negative change in the forest cover during the period (**13.79 Km²**), followed by Warangal Circle (**7.44 Km²**). Least negative change is noticed in Adilabad Circle (**0.12 Km²**).

b. Encroachments are noticed in 22 of the 25 Divisions in the state. The Divisions accounting for most negative changes are: **Nizamabad** (**6.44 Km²**), **Paloncha** (**6.00 Km²**), **Warangal North** (**4.22 Km²**) and **Paloncha WLM** (**3.95 Km²**), **Kothagudem** (**2.87 Km²**).

c. **VSS** areas (areas under Joint Forest Management) account for **5.21 Km²** of encroachments. **Encroachments** are noticed in **63 VSS** in the state. The VSS accounting for most negative changes are: **Tadlapally** of Nizamabad Division (**60.11 Ha**), **Jannampet** of Paloncha Division (**59.17 Ha**), **Mangampet** of Paloncha Division (**43.93 Ha**), **Ananthogu** of Paloncha WLM Division (**32.95 Ha**) and **Yatalkunta** of Khammam Division (**22.12Ha**).

d. **Encroachments are noticed in 5 Protected Areas out of 12 in the State, totalling to 5.44 Km²** of area. **No encroachments are noticed in 7 Protected Areas**. The **Protected Areas** accounting for most negative changes are: **Kinnerasani** (**394.84 Ha**), **Pakhal** (**78.60 Ha**), **Eturnagaram** (**42.11 Ha**), **Amarabad TR** (**21.87 Ha**) and **Kawal TR** (**5.95 Ha**).

e. **No changes in forest cover** are noticed in Medak WLM, Kawal TR East(Jannaram) Divisions.

C. FOREST COVER OUTSIDE THE NOTIFIED FORESTS:

a. Extent of tree cover outside the Forests has been assessed to be **6957.22 Km²** which is about 6.21% of the Geographical area of the State.

b. The natural forests, manmade plantations and habitations contribute to 33.42%, 28.50% and 38.08% of the total tree cover outside the notified forests respectively.

D. OVERALL FOREST COVER:

The overall forest cover in the State, inside and outside the notified forests, is **23,461.55 Km²** which comes to 20.93% of the Geographical area of the State.



Chapter - I

Introduction

1.1 About the state

Telangana is the twelth largest state in India, geographical area wise; with an area of **112101 Km^2**. It is bounded by Maharastra, Chhattisgarh and Orissa in the north, Andhra Pradesh in the east and south and Karnataka & Maharastra in the west. The state was formed on 2nd June, 2014 by Government of India as 29th State. It has **26903.70 Km^2** of notified forest land, which is **24.00%** of the Geographical area.

The population of the state is 33.61million (2011 census) which is 2.77% of country's population. Nearly 61.33% of the population of the state is rural, which primarily depends on agriculture for livelihoods. Scheduled castes constitute about 15.43% and Scheduled tribes about 9.33% of the population. Hyderabad, Karimnagar, Nizamabad, Khammam and Warangal are the principal towns in the state with over a million population. Traditionally, the state is divided into two regions called South Telangana Region, consisting of the 4 districts and North Telangana region consisting of 5 districts.

1.2 History of Geomatics in Forest Department

Prior to 1994, there was no mechanism to monitor the Forest cover changes in composite state of Andhra Pradesh. It used to rely on the data given by the Forest Survey of India, Dehradun through its biennial 'State of Forest Reports'. However, these reports, which were brought out since 1987, did not provide the statistical information on the forest cover inside the notified forest under the control of forest Department and outside, separately. It presented a nation-wide & state-wise picture of the green cover, inclusive of the areas outside the notified forests. These provide data only upto the district level and no statistics of forest/tree cover were available below the district units. Therefore, a necessity was felt for generating this data for the notified forest areas, which are under the control of Forest Department, upto the smallest unit of administration, i.e, Beat level and the management i.e, compartment level. This could have been possible only with the setting up of Geomatics unit at the state level. This required procurement of satellite imagery, Hardware, Software, and technical trained manpower for which huge investment was essential. The opportunity came with the launch of World Bank funded Andhra Pradesh Forestry Project in 1994. A consultancy for setting up and operationalization of a Geomatics center at Hyderabad was provided in the project and given to FAO, Rome headed by Dr K.D. Singh, a forester. A small Geomatics Center was set up in the old Aranya Bhavan, with required hardware and software.



Few Officers of the Department were trained in the Remote Sensing, GPS, Inventory and GIS at ITC; Netherlands; Finnish Forest Research Institute, Finland; IIRS, Dehradun; and NRSC, Hyderabad. These Officers started working in the Geomatics center and started sensitizing the other Officers in the use of Remote Sensing, GIS and GPS. Gradually, the training was extended to the officers & staff of Department and also to the other departments and members of communities like VSSs.

Geo-spatial database, both Administrative as well as Management point of view was created. This work was outsourced in 1994, for digitization of forest blocks, administrative boundaries, rivers, water bodies, villages, roads and forest cover density layers with attribute data. These layers were generated by the end of 1995. Subsequently ERDAS Imagine Software and PC Arc Info version 3.4.2 were procured. Later on about 250 basic and derived themes were generated on 1:50 K and higher Scale. This data is being used in the various decision support systems, monitoring of forest cover changes and several other applications in the department. The IT wing has been procuring all the latest hardware, software, data as and when required. Now, it is equipped with latest hardware like Blade Servers, High-end workstations, Firewall, PDAs, Multi frequency DGPS/ DGNSS receivers and the sophisticated software like ArcGIS Server, Leica Photogrammetric Suite, ERDAS 2012, ArcGIS 2012 and Skyline Globe. The Geomatics Center is now a State of the Art facility in the State. It has also developed web-enabled modular based GIS-MIS integrated Telangana State Forest Mangement Informations System (TGFMIS) for monitoring various activities of the Department online.

1.3 History of monitoring of the Forest cover change

The Forest cover monitoring in Andhra Pradesh was initiated in 1995 with Adilabad District using IRS IA/IB LISS-II images of 1988 and 1994 using 'Interdependent Visual Interpretation' method. The results were brought out in 1995-96 upto Range level only. Subsequently, for interpreting the IRS IC and IRS 1D LISS-III data of 1996 & 1998, the task was outsourced. Methodology was formulated by the department through intensive field observations and the interaction with the experts in the field of Geomatics. These agencies digitally interpreted the canopy densities of the forests and submitted the results to the Forest Department. The notified forests were classified into **water bodies, Blanks/others**, **Scrub**(0-10% Canopy), **Open forests** (10 to 40% canopy) and Dense forests (>40% canopy), almost in line with the FSI classification, except very dense forests class (>70% canopy) of FSI which was clubbed in Dense Forests for simplification.



There after with the infusion of the trained officers in the Center, the forest cover change monitoring has been carried out by the Geomatics centre in-house regularly, on annual basis commensing from the year 2000 using LISS-III data through digital interpretation methods like Vegetation Indices, Supervised and Unsupervised Classification, PCA etc with the help of feature space metrics and the composite map of most commonly occurring areas of a particular class in each map was generated. This method was adopted with an intention to use all the bands of the LISS III data, which is being adopted all over the World. The classified maps were sent to the field officers for ground truthing for verification in the field as a whole and also at points generated by using the Probability Proportionate Stratified Random Sampling method; the feedback format was communicated. The corrections were carried out based on the feedback furnished. The classified maps gave the complete picture of the beat every year. This method was followed up to 2006 and statistics on various classes of Forest canopy cover were generated up to the lowest unit i.e., beat and compartment by eliminating **0.5 Ha** Area.

1.4 Refinement of methodology of Forest Cover & change Assessment

The Forests of Telangana are mostly deciduous in nature and its canopy density widely changes in different months. It is a well known fact and experience has shown that repeated digital classification annually is prone to interpretational errors and overlaying two classified images does not give proper change image at times because of the limitation in the technology including the interpretation techniques, LISS III image etc. It was, therefore, decided to use Hybrid method of NDVI cum Digital Classification with limited visual editing and better method in terms of final accuracy was taken in 2009. It was observed that independent classification for 2 images and then comparison is not giving the accurate results, even on application of hybrid NDVI and digital classification method which is attempted for few districts, which is proved by eminent scientists all over the World. **Therefore, there is no foolproof method of classifying the images in such a way that the classes are coincidental to each other in two different classified images**. Hence, it was decided to classify one year image and make it as master and then compare it with the subsequent year's classified image to find out the changes and posting only the changes in the master classified map. This was performed using the tools available in ERDAS Imagine Software viz., matrix tool for comparing two independent classified maps, and also the change detection tool for comparing two FCCs.

The 2008 image was compared with 2007 classified map & FCC and the positive & negative changes were digitized and posted in 2007 classified map. Similarly, in subsequent years the 2009



image was compared with 2008 classified map & FCC, 2010 image with 2009 classified image & FCC, 2011 image with 2010 classified image & FCC, 2012 image with 2011 classified image & FCC and changes were posted accordingly in the classified image of 2007. Over last 5 years, wherever the interpretation errors were found, the same are corrected in the classified image. For the present assessment, 2013 image has been compared with 2012 classified image & FCC using the above techniques.

In all the above comparisons, the change polygons digitized between 2 years were used as background. The changes were to some extent ground truthed by Geomatics wing and the remaining by the field staff for total verification. For easy access to the data, all the change points were kept on the website of the FD. Feedback was obtained through a web enabled MIS package called as **'Forest Cover Change MIS'.** The digitization of polygons improved the cartographic presentation of the output, helped map the changes more accurately and made the output available for the use by protection staff. Both positive and negative changes were captured for about 735 locations and communicated to field staff for verification and feedback.

As explained above, irrespective of the method attempted, the interpretation of the images are prone to errors, because of several limitations of the LISS Images. Therefore, it had been decided to do the classification during 2014-16 using the high resolution cartosat images and LISS IV data. Accordingly, the LISS IV data from NRSC procured, vegetation classification carried out for certain districts using LISS IV & Cartosat data and in the present report, the results are incorporated for certain districts. Google Earth Images have also been consulted. However, the difference in the exents have not been counted towards degradation in the forest cover as it is only because of carrying out the corrections in the earlier classified maps which had crept due to limitations in LISS III data and the interpretation techniques. Some of the old encroachment areas where agriculture is being practiced were shown as forests which now stand corrected.



Chapter - II
Methodology

2.1 Satellite data and its period

The multi-spectral (LISS-III Sensor) data of Resourcesat-2 satellite with a spatial resolution of 23.5M for the entire State has been procured from the National Remote Sensing Center (NRSC), Hyderabad in digital form. One scene of LISS–III covers an area of about **20,000 Km²** (about 140 km *140 km); there is 15 to 20% overlap among adjacent scenes. Irrespective of the extent of area for an Area of Interest (AOI), the entire scene in which AOI falls has been procured. Thus, in all 15 scenes were procured for covering the entire state. The scene wise details of data procured is as follows:

S.No	Path/Row	DOP 2012	DOP 2012	Remarks
1	99-58	29-Oct-12	11-Dec-13	Cloud Free
2	99-59	17-Oct-12	11-Dec-13	Cloud Free
3	99-60	29-Oct-12	11-Dec-13	Cloud Free
4	99-61	10-Nov-12	11-Dec-13	Cloud Free
5	99-62	10-Nov-12	11-Dec-13	Cloud Free
6	100-59	10-Oct-12	16-Dec-13	Cloud Free
7	100-60	10-Oct-12	16-Dec-13	Cloud Free
8	100-61	10-Oct-12	16-Dec-13	Cloud Free
9	100-62	10-Oct-12	16-Dec-13	Cloud Free
10	101-59	15-Oct-12	21-Dec-13	Cloud Free
11	101-60	15-Oct-12	07-Feb-14	Cloud Free
12	101-61	08-Nov-12	07-Feb-14	Cloud Free
13	102-60	13-Nov-12	12-Feb-14	Cloud Free
14	102-61	13-Nov-12	19-Jan-14	Cloud Free
15	103-60	12-Dec-12	17-Feb-14	Cloud Free

To improve the accuracy of the classification, the multi spectral (LISS-IV Sensor) data of Resourcesat-2 satellite with a spatial resolution of 5.8 m for the entire State, has been procured from the National Remote Sensing Center (NRSC), Hyderabad in digital form. One scene of LISS – IV covers an area of about **4900 Km²** (about 70 km * 70 km). The scene wise details of data procured is as follows:



Path & Row	Sub scene	DOP	Path & Row	Sub scene	DOP
99-58	d	4-Nov-11	100/61	a	3-Dec-11
99/59	a	6-Dec-14		b	9-Nov-11
	b	30-Dec-14		d	9-Nov-11
	c	6-Dec-14	100/62	b	16-Dec-13
	d	30-Dec-14	101/59	a	29-Oct-14
99/60	a	6-Dec-14		c	29-Oct-14
	b	11-Dec-13		d	22-Nov-14
	c	6-Dec-14	101/60	a	29-Oct-14
	d	11-Dec-13		b	15-Oct-12
99/61	a	6-Dec-14		c	29-Oct-14
	b	11-Dec-13		d	2-Dec-12
	c	6-Dec-14	101/61	a	29-Oct-14
	d	8-Feb-12		b	2-Dec-12
99/62	b	11-Dec-13		d	14-Nov-11
100/59	a	3-Dec-11	102/60	a	19-Nov-11
	b	16-Dec-13		b	21-Dec-14
	c	3-Dec-11		c	7-Dec-12
	d	22-Nov-14		d	13-Dec-11
100/60	a	3-Dec-11	102/61	a	19-Nov-11
	b	9-Nov-11		b	13-Dec-11
	c	3-Dec-11		c	19-Nov-11
	d	9-Nov-11		d	13-Dec-11

2.2 Technical Advisory Committee:

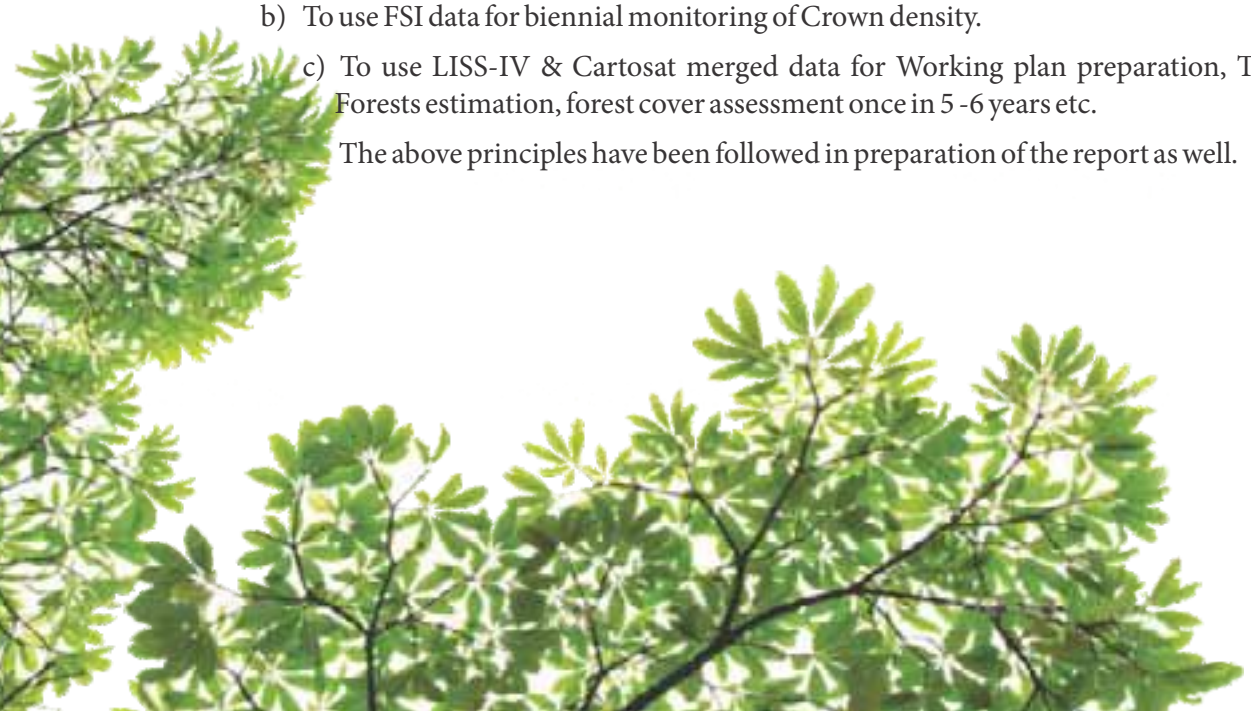
Technical Advisory Committee constituted by the Government to aid and advise the Forest Department in matters of Remote Sensing & GIS application in its meeting on 11.11.2011 had taken the following decisions:

a) To address the encroachments & greening changes on annual basis using vegetation index methods.

b) To use FSI data for biennial monitoring of Crown density.

c) To use LISS-IV & Cartosat merged data for Working plan preparation, Trees outside Forests estimation, forest cover assessment once in 5 -6 years etc.

The above principles have been followed in preparation of the report as well.

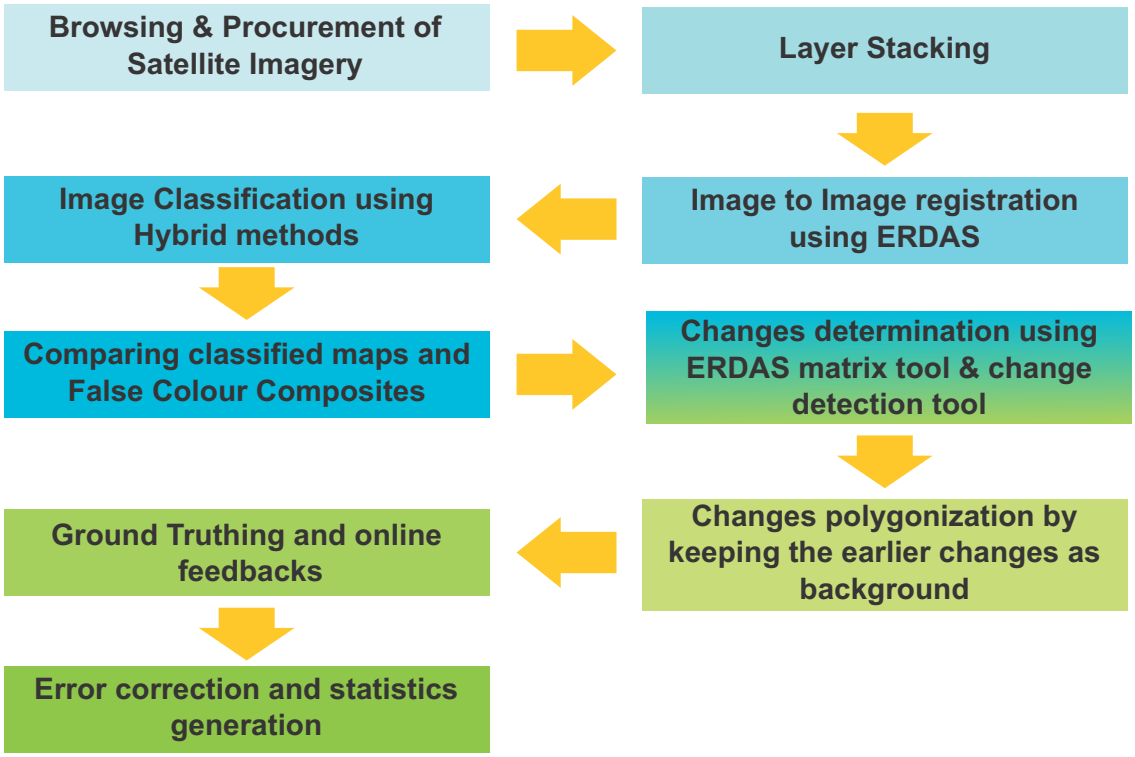


2.3 Image Processing Technique Adopted:

As described in Para 1.4, annually only the changes between 2 years have been polygonised and posted into the 2007 classified image starting from 2007 to 2012. To accomplish this task, the 2013 image has been registered with 2012 image using **Erdas Autosync module**. Hybrid method of NDVI cum digital Classification with visual editing is used to classify the LISS-III Image into various canopy density classes. Before classifying, the Satellite Images have been radiometrically normalized. To determine the changes from one class to another, the tools available in ERDAS Imagine Software have been used. All the change polygons from 2007 to 2012 were kept as background and the changes between 2012 and 2013 were polygonised mainly through manual Polygonisation. The latitude & longitude of the 735 change Polygons as well as change classes, both (from class & to class) and the extent of areas changed have been communicated to field officers for verification and provide feedback through the **Forest Cover Change Monitoring Information System**. There was good Correlation between area, location and shape of the change points shown in the lab and the situation on ground.

In accordance with the decision of TAC, the classification will be taken up during 2014-16 using high resolution LISS-IV and Cartosat Images. This will remove the limitations to a large extent.

The flow diagram of the work carried is as follows:



2.4 Limitations of Technology

The following are the limitations of the technology:

- As the resolution of LISS-III data is 23.5m, smaller areas below **0.40 Ha** cannot be captured.
- Young plantations and species having less chlorophyll content in their crown, do not give proper reflectance and as a result correct interpretation of such areas becomes difficult.

- The subtle variation especially in the positive changes cannot be polygonised using visual interpretation techniques, hence underestimated.
- Considerable details on ground could be obscured in areas having clouds and shadows. It is difficult to interpret such areas without the help of collateral data.
- Variation in spectral response pattern during leafless period poses problems in interpretation.
- Gregarious occurrence of bushy vegetation like Lantana and certain agricultural crops, such as sugarcane, cotton, etc. often pose problems in delineation of forest cover change as their spectral response pattern is similar to that of tree canopy.
- In encroached areas harvested agriculture crop gives a pseudo change impression. Discrimination between agriculture and dense forest areas is difficult sometimes using NDVI alone.

2.5 Accuracy Assessment:

Accuracy was estimated in the monitoring activity restricting to the change polygons only. It was found that the change polygons given by Geomatics wing were acurate in extent, location and shape. The accuracy achieved was **about 98%.** Occasional errors were found in interpretations showing loss of vegetation because of inter-ploughing of plantations and weeding of dense weeds, deciduous nature of our forests and crop harvested areas in encroached forest lands.



Chapter - III

State-wise Results and Analysis

3.1 Introduction

Telangana State lies between 15^{0}50'12" N & 19^{0}55'2" N latitudes and 77^{0}14'55" E & 81^{0}19'30" E longitudes. The Geographical Area of the State is **112102 Km^2** which is **3.41%** of the landmass of the country. The State has two physiographic zones, the hilly region having an altitude of 500 to 1324 m; the plateau having an altitude of 46 M to 1000 M. Godavari and Krishna are the 2 principal rivers of the State which drain into the Bay of Bengal through Andhra Pradesh. The River Godavari with its tributaries Pranahita, Manjeera, Maneru, Indravati, Kinnerasani, Pamuleru and Sileru, flows through the northern parts of the State into Bay of Bengal. The River Krishna with its tributaries Tungabhadra,Vedhavati, Musi, Paleru and Munneru flows through the southern parts of the State.

Table 3.1: Land use pattern

Land use	Area in Km^2	Percentage
Forest including Scrub	24510.98	21.86
Agriculture	70904.91	63.25
Land with Scrub	5785.49	5.16
Fallow Lands	2219.58	1.98
Grasslands	204.50	0.18
Settlements	1220.66	1.09
Vegetation outside Forest	3645.61	3.25
Water bodies	3610.55	3.22
Total	**112102.28**	**100.00**

Source: AS per LULC map prepared by NRSC, Hyderabad in 2007

Land use pattern of the State is given in Table 3.1. The climate of this State is generally dry with temperature ranging from 8^{0}C to 52^{0}C and the annual rainfall is about 500-1300 mm, received mainly from Southwest monsoon. The geological formations of the State are: (1) The unclassified Archaean crystalline rocks are mainly the granite, (2) The Mesozoic the coal bearing Gondwana strata, (3) Eocene lava flows (the Deccan traps) and (4) The semi-consolidated or unconsolidated tertiary and recent rocks. The soils of the State are Red, Black, Alluvial, Laterite and Saline/Alkaline.

The population of the State is 35.29 million (2011 Census). The male population is 17.75 million and female 17.54 million. The Per capita forest area is **0.08 Ha**. The population density is **307** persons per **Km^2**. The livestock population is 80 million.



3.2 Recorded Forest Area

The notified forest area of the State is **26903.70 km**, which is **23.99%** of the geographical area. Reserved-, Protected- and Un-classed forests occupy **18294.52 Km²** (68%), **7802.07 Km²** (29%) and **807.11 Km²** (3%) of the forest area respectively. The Adilabad District has the highest notified forest area of **7101.30 Km²** and the Rangareddy the lowest of **758.87 Km²**, in the State. As regards the ratio of notified forest to geographical area, Khammam District has the highest (45.49%) and Nalgonda the lowest (6.25%). As per Champion and Seth's classification, the Forests of the State fall under Dry Teak Forest, Southern Dry Mixed Deciduous Forest, Dry Deciduous Scrub, Dry Savannah Forest, Hardwickia Forest, Dry Bamboo Brakes, Southern Thorn Forest.

3.3 Protected Area

The State has 12 Protected Areas, consisting of 9 Wildlife Sanctuaries & 3 National Parks. 2 Wildlife Sanctuaries have been notified as Tiger Reserves i.e. Amrabad Tiger Reserve and the Kawal Tiger Reserve. Out of **26903.70 Km²** of notified forest area, **5856.04 Km²** is included in the PA network.

3.4 Community Forest Management

There are 3264 Vana Samrakshana Samities (VSSs) or Joint Forest Protection Committees (JFPCs) in the State. An area of **6756.41** Km² of notified forests, which is **25.11%** of the forest area, is under Joint Forest Management (JFM). 9.1 Lakh members are involved in JFM. It includes 2.3 Lakh members belonging to Scheduled Tribes(STs) and 1.8 Lakh members belonging to Scheduled castes(SCs).

3.5 Forest Cover

The forest cover* in the State is based on the interpretation of IRS R2 LISS-III 2013 data (December 2013-February 2014) and LISS-IV data (2011-2014) is **16504.33 Km²**, which is **14.72%** of the Geographical area. In terms of the forest canopy cover density classes the State has **286.66 Km²** of Very Dense Forest (VDF), **7789.48 Km²** of Moderately Dense Forest (MDF) and **8428.19 Km²** of Open Forest (OF). The area of the Scrub is **4326.91 Km²**, Non-Forest **5930.77 Km²** and Water Bodies **141.69 Km²**.

**The forest cover is defined as area covered by VDF, MDF and OF.*

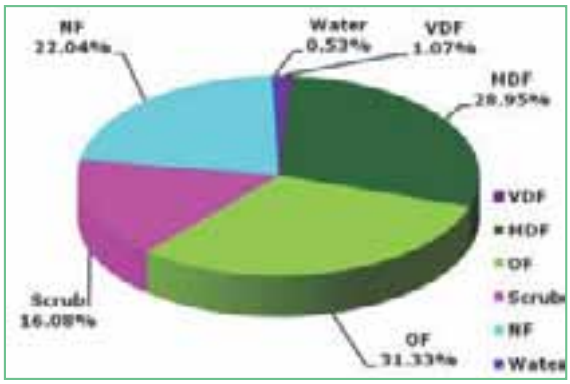


Fig 3.1

The distribution of the forest cover of the State is shown in Figure 3.1.



The distribution of Forest Cover in the JFM areas is 25.76 Km² in Very Dense Forest, **1577.68 Km²** in Moderately Dense Forest and **2192.21 Km²** in Open Forest. The area of Scrub is **1223.58 Km²**, Non-Forest **1719.11 Km²** and Water bodies **18.05 Km²**.

The distribution of Forest Cover in the PA areas is **25.96 Km²** in Very Dense Forest, **1698.06 Km²** in Moderately Dense Forest and **2118.31 Km²** in Open Forest. The area of Scrub is **998.85 Km²**, Non-Forest **912.30 Km²** & Water bodies **102.58 Km²**.

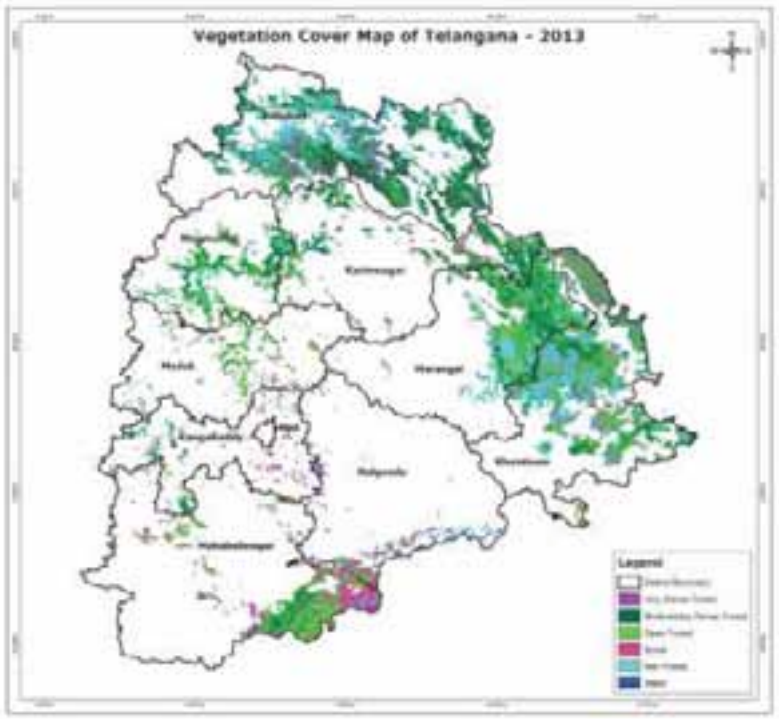
Change in Forest Cover(Including Scrub and Non-Forest): An analysis of the total extent of Forests between 2012 and 2013 shows that degradation is seen in an area of **62.80 Km²** and positive change in **27.58 Km²**. An area of **50.78 Km²** of forests including scrub (**9.76 Km²** of MDF, **24.81 Km²** of OF and **16.21 Km²** of scrub) is converted to Non forest during the year.

On further analysis it is seen that out of this **62.80 Km²** of loss of forests, an area of **29.08 Km²** is due to attempts on encroachments in the State, **7.35 Km²** is due to harvesting of matured plantations and **25.38 Km²** is due to clearance of jungle growth for raising of plantations and **1.01 Km²** is diversion of forest land. The later are management interventions and hence cannot be considered as loss of forests. Hence loss of forest cover due to encroachments only is taken as net loss of forests, which is **29.07 Km²**. Out of this an area of **5.21 Km²** is inside VSS areas and **5.44 Km²** inside the Protected Areas.

Encroachments were noticed in 22 Divisions, positive changes in 5 Division and no changes in 02 Divisions (WLM Medak, and Kawal East TR (Jannaram)).

Change in Forest Cover (**Excluding Scrub & Non-Forest**) : The forest cover in VDF, MDF and OF in 2012 was **286.66 Km²**, **7805.28 Km²** and **8447.24 Km²** respectively. However in 2013 it is **286.66 Km²**, **7789.48 Km²** and **8428.19 Km²** respectively. Thus there was a reduction of **15.80 Km²** in MDF and **19.05 Km²** in OF. The net loss of forest cover in MDF and OF put together is **34.85 Km²** in the State during the year.

Fig 3.2



In TSFR 2014, the forest cover in VDF, MDF and OF in 2012 was shown as **502.35 Km²**, **9052.41 Km²** and **9209.91 Km²** respectively. The area of the Scrub was shown as **5305.88 Km²**, Non-Forest **2649.79 Km²** and Water Bodies **183.36 Km²**. These are corrected using the high resolution LISS-IV and Cartosat data. It is already mentioned in Chapter II about the limitations in the LISS-III data and the NDVI. Some of the old encroachment areas where agriculture is being practiced were shown as forests which are now corrected. Therefore, this shall not be treated as loss in forest cover between 2012 and 2013; it is only the correction of areas.

Divisions with most loss of Forest Cover due to encroachments are Nizamabad, Paloncha, Warangal North, Paloncha WLM & Kothagudem Divisions.

In JFM areas, there is a net loss of **10.23 Km²** of forest cover. In Protected Areas, there is a net loss of **4.93 Km²** of forest cover. The change locations are shown in Figure 3.2.

The forest cover change matrix, showing changes from one class to other, is given in Table 3.2. It reveals that there has been a decrease of **15.80 Km²** of MDF and **19.05 Km²** of OF. On the basis of ground truthing conducted by the officers of the Geomatics Center and the field officers, the **main reasons for decrease in the forest cover** are management interventions like harvesting(clear felling) of matured plantations, clearance of bush growth and preparation of land for raising of plantations and fresh attempts on encroachments.

Division wise forest cover in different forest canopy density classes along with the changes compared to 2012 assessment is given in Table 3.3.

Table 3.2 Forest Cover Change Matrix: **(Area in Km²)**

2012	2013						Total of 2012
	VDF	MDF	OF	Scrub	NF	WATER	
Very Dense Forest	286.66	0.00	0.00	0.00	0.00	0.00	286.66
Moderately Dense Forest	0.00	7789.13	0.00	6.39	9.76	0.00	7805.28
Open Forest	0.00	0.00	8416.80	5.63	24.81	0.00	8447.24
Scrub	0.00	0.35	3.90	4299.05	16.21	0.00	4319.51
Non-Forest	0.00	0.00	7.49	15.84	5879.99	0.00	5903.32
Water	0.00	0.00	0.00	0.00	0.00	141.69	141.69
Total of 2013	286.66	7789.48	8428.19	4326.91	5930.77	141.69	26903.70
Net Change	0.00	-15.80	-19.05	7.40	27.45	0.00	

Table 3.3 Forest Cover Changes in divisions: **(Area in Km²**

S. No & Division	VDF	MDF	OF	SF	NF	WB	TOTAL	Encroachments during current assessment
I. ADILABAD CIRCLE								
1.Adilabad	7.04	454.64	215.75	178.99	537.55	2.53	1396.50	0.03
2.Bellampally	73.60	407.30	227.03	169.46	281.64	4.46	1163.49	0.00
3.Kagaznagar	63.37	425.21	173.56	36.69	193.04	1.42	893.29	0.07
4.Mancherial	85.11	581.67	272.42	94.21	77.72	4.24	1115.37	0.02
Total	**229.12**	**1868.81**	**888.77**	**479.35**	**1089.95**	**12.65**	**4568.65**	**0.12**

II. KAWAL TR CIRCLE								
5. Kawal East -Jannaram	35.78	537.11	179.41	224.76	266.50	0.98	1244.54	0.00
6. Kawal West -Nirmal	3.03	255.31	396.29	325.95	305.10	2.44	1288.12	0.47
Total	**38.81**	**792.42**	**575.70**	**550.71**	**571.60**	**3.42**	**2532.66**	**0.47**
III. FDPT AMARABAD CIRCLE								
7. Achampet WLM	0.15	477.75	1017.03	726.00	144.00	58.44	2423.37	0.05
8. Nagarjunsagar WLM	0.00	7.50	144.88	204.04	84.14	6.59	447.15	0.23
Total	**0.15**	**485.25**	**1161.91**	**930.03**	**228.14**	**65.03**	**2870.52**	**0.28**
IV. HYDERABAD CIRCLE								
9.Hyderabad	0.00	110.70	181.79	301.59	162.13	2.67	758.87	0.09
10.Mahabubnagar	0.00	15.50	274.25	257.52	72.06	0.15	619.48	0.03
11.Nalgonda	0.00	0.21	27.14	210.21	202.65	1.79	442.00	0.06
Total	**0.00**	**126.41**	**483.17**	**769.31**	**436.85**	**4.61**	**1820.35**	**0.18**
V. KHAMMAM CIRCLE								
12.Bhadrachalam North	9.27	299.39	468.91	286.93	187.54	3.46	1255.49	0.30
13.Khammam	0.15	329.12	456.90	152.16	381.61	2.40	1322.34	1.07
14.Kothagudem	0.00	315.77	476.80	204.74	683.54	3.04	1683.88	2.87
15.Paloncha	7.75	180.10	408.17	153.18	294.81	3.15	1047.17	5.60
16.Paloncha WLM	1.41	198.22	214.17	51.91	208.34	12.34	686.38	3.95
Total	**18.58**	**1322.60**	**2024.94**	**848.92**	**1755.83**	**24.39**	**5995.26**	**13.79**
VI. NIZAMABAD CIRCLE								
17.Kamareddy	0.00	315.83	424.00	56.30	181.46	3.70	981.29	0.31
18.Medak	0.00	88.00	454.72	224.97	146.37	2.51	916.58	0.05
19.Medak WLM	0.00	21.28	19.99	2.59	2.65	0.03	46.54	0.00
20.Nizamabad	0.00	288.24	266.24	54.07	173.64	4.94	787.13	6.44
Total	**0.00**	**713.35**	**1164.95**	**337.94**	**504.12**	**11.18**	**2731.54**	**6.80**
VII. WARANGAL CIRCLE								
21.Karimnagar East	0.00	640.47	392.34	211.63	136.22	6.14	1386.80	0.27
22.Karimnagar West	0.00	483.49	304.86	93.35	91.01	1.76	974.47	0.72
23.Warangal North	0.00	906.07	909.56	64.00	424.87	5.75	2310.25	4.22
24.Warangal South	0.00	239.74	263.52	29.52	636.76	5.10	1174.65	1.90
25.Warangal WLM	0.00	210.87	258.45	12.14	55.42	1.66	538.55	0.33
Total	**0.00**	**2480.65**	**2128.74**	**410.65**	**1344.27**	**20.41**	**6384.72**	**7.44**
Grand Total	**286.66**	**7789.48**	**8428.19**	**4326.91**	**5930.77**	**141.69**	**26903.70**	**29.08**



Chapter IV

Forest Division-wise results



4.1 ADILABAD DIVISION

4.1.1. Introduction

Adilabad Forest Division lies in Northern Part of Adilabad District between latitudes 19^0 9' 54" N and 19^0 55' 2" N and longitudes 78^0 7'24" E and 79^{0}1' 54" E. The Geographical Area of the Division is **3882.11 Km^2**, which constitutes **24.07%** of the total area of the District. The highest hill ranges are situated in the south-east corner of the Division. They are Kuchanpally 646 M above MSL and Tummidipally gutta 634 m above MSL. The important rivers of the Division are Kadam, Penuganga and Peddavagu; which are tributaries of River Godavari.

Land use pattern of the Division is given in Table 4.1.1.

The climate of the Division is characterized by hot summer and is generally dry except during the south-west monsoon season. The temperature varies from 15^{0}C to 40^{0}C. The average annual rain fall of the Division is 1051mm, received mainly from south-west monsoons.

The soils vary with underlying rock formation. Black cotton Chalka and Red, Sandy loams, Saline and Alkaline soils are found. The District is well endowed with rich reserves of coal, iron ore, lime stone and clays.

The total population of the Division is 0.71million (2011 Census). The Per capita forest area is **0.27 Ha**. The population density is 148 persons per Km^2.

4.1.2. Recorded Forest Area:

The notified forest area of the Division is **1327.90 Km^2** which is **34.20%** of the geographical area. The area under Reserved, Protected and Un-classed Forests is **996.47 Km^2** (75.04%), **317.87 Km^2** (23.94%) and **13.56 Km^2** (1.02%)respectively.

As per Champion and Seth's classification, the Forests of Division fall under Tropical dry deciduous& Bamboo Mixed Forests (Dry Teak bearing Forests, Dry Mixed Forests).

Table 4.1.1: Land use pattern (for entire Geographical area)

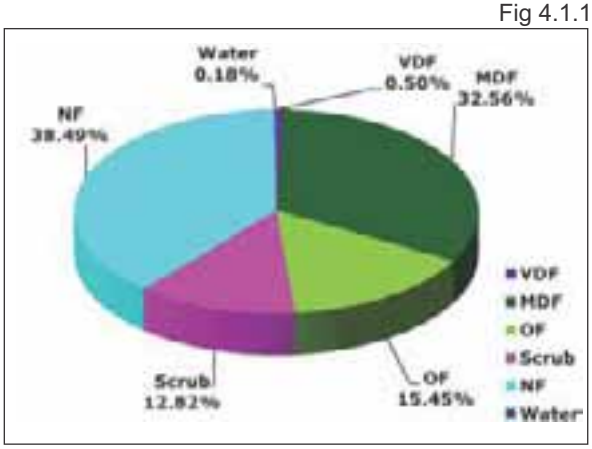
Land use	Area in Km^2	Percentage
Forest including Scrub	1220.82	31.45%
Agriculture	2136.41	55.03%
Land with Scrub	290.73	7.49%
Fallow Lands	76.03	1.96%
Grasslands	0	0.00%
Settlements	19.57	0.50%
Vegetation outside Forest	107.06	2.76%
Water body	31.49	0.81%
Total	**3882.11**	**100.00%**

Source: As per LULC map prepared by NRSC, Hyderabad in 2007

4.1.3. Protected Area:

There is no PA in this Division. Out of the old Adilabad Division an area of **506.6 Km^2** is transferred to **Kawal East TR (Jannaram) & Kawal West TR (Nirmal)**Divisions.

Fig 4.1.1



4.1.4. Community Forest Management:

There are 322 Vana Samrakshana Samities (VSSs) or Joint Forest Protection Committees (JFPCs) in the Division. An area of **308.32 Km^2** forests, which is **23.22 %** of the notified forests, is under the management of the VSSs.

4.1.5. Forest Cover:

The forest cover in the Division based on the interpretation of IRS R2 LISS-III 2013 data (Dec 2013)

and LISS-IV data (2011-2014) is **677.43 Km²** which is **17.45%** of the Geographical area. In terms of the forest canopy density classes the Division has **7.04 Km²** of Very Dense Forests, **454.64 Km²** of Moderately Dense Forests and **215.75 Km²** of Open Forests. The area of the Scrub is **178.99 Km²**, Non-Forest **537.55 Km²** and Water Bodies **2.53 Km²**. The distribution of the forest cover of the Division is shown in Fig 4.1.1.

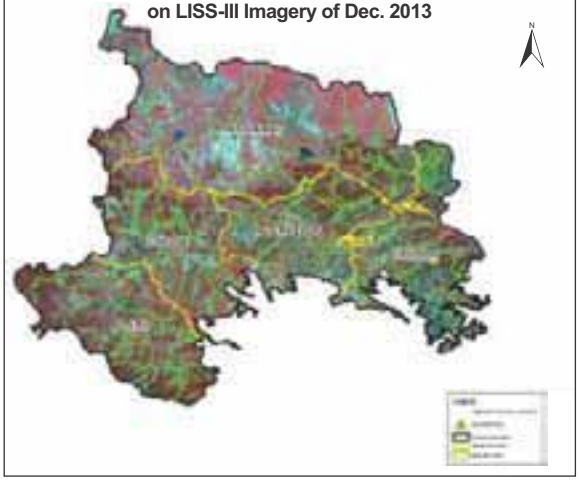
4.1.6. Change in Forest Cover

The Satellite images of 2012 and 2013 have been shown in Fig (4.1.2 & 4.1.3) and the changes between this period are shown on the image of 2013.

Fig 4.1.3: LISS-III Imagery of Adilabad Division of Oct. 2012



Fig 4.1.2: Vegetation Change Locations of Adilabad Division on LISS-III Imagery of Dec. 2013



Comparison of the current forest cover with that of previous assessment year shows a negative change of **2.71 Ha**. However, including the scrub, the total negative change comes to **2.71 Ha**. The forest cover change matrix given in Table 4.1.2 reveals the changes from one class to another class.

The entire negative change is on account of encroachments. Therefore the **net loss of Forest is 2.71 Ha.**

There are 57 Beats in the Division. Negative changes in forest cover are noticed in 1 Beat only. There are no changes in the remaining 56 Beats.

Details of forest cover in all Beats of the Division are shown in Table 4.1.3.

Table 4.1.2. Forest Cover Change Matrix: (Area in Km²)

2012	2013						Total of 2012
	VDF	MDF	OF	Scrub	NF	WATER	
Very Dense Forest	7.04	0.00	0.00	0.00	0.00	0.00	7.04
Moderately Dense Forest	0.00	454.64	0.00	0.00	0.03	0.00	454.67
Open Forest	0.00	0.00	215.75	0.00	0.00	0.00	215.75
Scrub	0.00	0.00	0.00	178.99	0.00	0.00	178.99
Non-Forest	0.00	0.00	0.00	0.00	537.52	0.00	537.52
Water	0.00	0.00	0.00	0.00	0.00	2.53	2.53
Total of 2013	**7.04**	**454.64**	**215.75**	**178.99**	**537.55**	**2.53**	**1396.50**
Net Change	0.00	-0.03	0.00	0.00	0.03	0.00	0.00



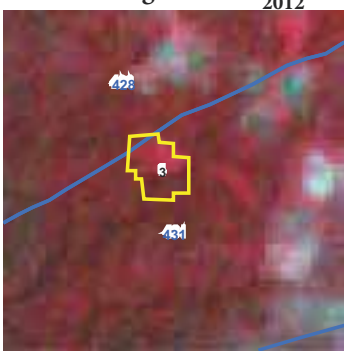
Table 4.1.3. Beat Wise Forest Cover: Area in Ha

Beat	VDF	MDF	OF	SF	NF	WB	Total	Net Change	Encr.
ADILABAD RANGE									
Ankoli	33.88	1,782.54	368.64	250.56	690.37	5.82	3,131.81	0.00	0.00
Arjuni	5.96	802.96	226.92	220.10	988.42	10.31	2,254.66	0.00	0.00
Arli(n)	1.19	212.66	148.53	274.25	451.72	0.09	1,088.44	0.00	0.00
Arli(s)	1.41	324.50	226.45	196.87	390.82	8.50	1,148.55	0.00	0.00
Bhadi	17.04	801.95	228.47	181.74	1,300.69	0.40	2,530.28	0.00	0.00
Devapur	0.07	391.91	111.18	15.45	51.52	0.03	570.15	0.00	0.00
Dhaba	1.72	646.14	228.77	240.52	949.01	1.72	2,067.88	0.00	0.00
Downa	69.36	1,716.73	241.76	199.92	631.68	0.89	2,860.35	0.00	0.00
Khandu	10.86	1,076.21	260.45	205.69	1,499.40	3.81	3,056.41	0.00	0.00
Kosai	19.67	2,073.16	295.49	198.33	392.88	8.96	2,988.50	0.00	0.00
Kuchlapur	9.14	1,361.42	498.33	146.81	112.16	6.45	2,134.31	0.00	0.00
Masala	76.57	1,364.93	196.95	175.72	970.65	0.15	2,784.97	0.00	0.00
Mavala	0.02	569.72	414.41	129.66	355.17	1.87	1,470.85	0.00	0.00
Tamsi	1.18	512.80	184.66	86.22	522.61	0.00	1,307.48	0.00	0.00
Tantoli	0.00	300.36	417.28	193.35	968.54	1.70	1,881.23	0.00	0.00
Toyaguda	54.77	1,389.18	339.72	237.51	936.73	3.68	2,961.60	0.00	0.00
Yapalguda	0.00	125.16	172.49	121.12	1,351.04	0.06	1,769.87	0.00	0.00
Total	**302.84**	**15,452.33**	**4,560.50**	**3,073.82**	**12,563.41**	**54.44**	**36,007.34**	**0.00**	**0.00**
BOATH RANGE									
Arepally	19.66	689.70	618.86	549.29	1,419.18	1.48	3,298.16	0.00	0.00
Boath	4.22	941.12	831.41	697.87	484.01	5.16	2,963.80	0.00	0.00
Bondidi	6.80	504.30	592.52	635.99	793.95	0.64	2,534.21	0.00	0.00
Boregaon	3.31	369.26	543.82	545.06	1,659.35	0.63	3,121.43	0.00	0.00
Jeedipally	1.62	200.37	272.78	312.75	476.53	5.41	1,269.47	0.00	0.00
Kowta	2.11	210.43	307.46	391.34	1,566.35	2.96	2,480.65	0.00	0.00
Marlapally	12.09	2,998.00	1,301.00	620.82	753.82	51.83	5,737.55	0.00	0.00
Neradigonda	10.35	472.76	528.21	407.89	890.32	5.58	2,315.10	0.00	0.00
Pardi	0.83	594.22	356.86	261.14	558.15	10.97	1,782.17	0.00	0.00
Sonala	9.31	1,987.29	942.30	544.55	1,073.37	53.41	4,610.23	0.00	0.00
Wadoorpet	11.17	524.42	481.53	455.35	985.71	0.89	2,459.07	0.00	0.00
Wagdhari	0.40	82.92	92.59	142.05	560.85	0.07	878.88	0.00	0.00
Wankidi(e)	10.18	784.64	517.83	621.05	1,133.75	0.62	3,068.07	0.00	0.00
Wankidi(w)	5.81	581.45	589.75	715.13	930.04	0.32	2,822.50	0.00	0.00
Total	**97.86**	**10,940.88**	**7,976.92**	**6,900.28**	**13,285.38**	**139.97**	**39,341.29**	**0.00**	**0.00**
ECHODA RANGE									
Bharampur	11.97	1,121.26	431.50	318.71	486.71	0.38	2,370.54	0.00	0.00
Bhutai	17.05	777.02	419.41	325.24	1,069.97	0.84	2,609.53	0.00	0.00
Dedra	34.11	1,956.85	457.17	298.29	877.35	5.02	3,628.79	0.00	0.00
Dignoor	5.49	242.30	256.13	230.48	757.08	0.17	1,491.66	0.00	0.00
Echoda	3.92	251.77	353.86	186.64	492.15	0.48	1,288.82	0.00	0.00
Gairjam	3.40	104.14	189.08	134.57	362.47	0.19	793.84	0.00	0.00
Gudihathnoor	13.26	811.66	541.34	273.67	701.67	0.41	2,342.01	0.00	0.00

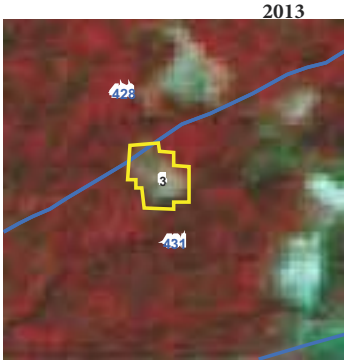
Harkai	11.69	917.46	396.99	230.02	458.83	0.27	2,015.28	0.00	0.00
Jhari	21.51	1,861.17	365.10	201.36	353.05	1.58	2,803.77	0.00	0.00
Madhapur	0.33	53.58	93.55	71.49	313.16	8.65	540.76	0.00	0.00
Talamadri	0.15	32.64	57.83	57.38	118.16	0.03	266.19	0.00	0.00
Total	**122.88**	**8,129.85**	**3,561.96**	**2,327.85**	**5,990.60**	**18.02**	**20,151.19**	**0.00**	**0.00**
INDERVELLY RANGE									
Chorgaon	3.82	785.01	492.73	399.92	2,483.32	2.63	4,167.43	0.00	0.00
Dhanora	0.26	60.06	106.08	161.83	702.77	0.06	1,031.05	0.00	0.00
Indervelly	6.33	1,325.25	639.77	680.78	2,009.78	1.34	4,663.26	0.00	0.00
Muthnoor	1.50	305.32	113.77	89.48	504.17	0.54	1,014.77	0.00	0.00
Pataguda	12.37	1,422.35	285.04	205.14	1,028.53	1.70	2,955.13	0.00	0.00
Pochampally(n)	0.33	119.02	393.59	456.80	1,994.51	0.91	2,965.15	0.00	0.00
Sayeedpur	21.86	1,279.80	297.07	248.63	992.86	2.86	2,843.08	0.00	0.00
Shampur	0.01	7.98	27.35	43.99	175.88	0.01	255.20	0.00	0.00
Tosham	14.72	651.60	184.17	68.68	563.34	0.11	1,482.62	0.00	0.00
Wadgaon	3.00	243.43	423.20	314.89	1,082.53	0.10	2,067.16	0.00	0.00
Total	**64.20**	**6,199.82**	**2,962.77**	**2,670.14**	**11,537.69**	**10.26**	**23,444.85**	**0.00**	**0.00**
UTNOOR RANGE									
Chinnakohinoor	1.53	16.41	16.44	20.83	53.29	0.00	108.49	0.00	0.00
Daboli	32.56	907.90	546.49	767.89	1,521.88	4.74	3,781.46	-2.71	2.71
Gadiguda	2.93	90.63	36.17	35.53	1,138.22	0.97	1,304.45	0.00	0.00
Gudamamada	10.18	799.12	425.60	755.66	1,346.22	4.72	3,341.49	0.00	0.00
Hasnapur	0.07	13.94	22.85	24.60	41.27	0.00	102.74	0.00	0.00
Kobbaiguda	10.98	260.20	217.43	185.10	792.77	0.37	1,466.87	0.00	0.00
Limbori	6.04	284.17	132.66	200.12	1,832.97	4.79	2,460.76	0.00	0.00
Lokari	8.87	459.09	301.37	229.55	582.73	3.70	1,585.31	0.00	0.00
Netnoor	7.50	68.05	27.65	22.56	74.39	0.00	200.16	0.00	0.00
Raghapur	15.03	104.87	85.26	63.64	169.78	0.00	438.58	0.00	0.00
Sedwai	2.73	271.68	94.76	104.99	821.87	1.70	1,297.74	0.00	0.00
Umri	14.70	994.75	340.38	236.71	1,114.72	1.95	2,703.22	0.00	0.00
Utnoor	0.00	5.82	53.30	81.00	219.45	0.52	360.10	0.00	0.00
Yempally	3.06	464.19	212.54	198.73	668.63	6.86	1,554.00	0.00	0.00
Total	**116.18**	**4,740.82**	**2,512.90**	**2,926.91**	**10,378.19**	**30.32**	**20,705.37**	**-2.71**	**2.71**
Division Total	**703.96**	**45,463.70**	**21,575.05**	**17,899.00**	**53,755.27**	**253.01**	**139,650.04**	**-2.71**	**2.71**

Satellite Imageries

2012



2013



Longitude	78.69947 ° E
Latitude	19.32659 ° N
Area in Ha	3.16
Change	DF TO NF
Comp No.	431
Beat	Shampur
Range	Indervelly
Division	**Adilabad**

4.2 BELLAMPALLY DIVISION

4.2.1. Introduction

Bellampally Forest Division lies in Adilabad District between latitudes 18°56' 20" N and 19°37' 1" N and longitudes 78° 56' 3" E and 79° 56' 48" E. Geographical Area of the Division is **2916.15 Km²** which is **18.08%** of the area of the District. The terrain is undulating with a fringe of low hills in different directions. The general elevation of hill ranges varies from 125 m to 570 m above MSL. Deccan gutta is the highest peak with an elevation of 633 m above MSL.

Land use pattern of the Division is given in Table 4.2.1.

The temperature varies from 15°C to 40°C. The average annual rainfall of the Division is 1051 mm received mainly from south-west monsoons.

The soils are predominantly black cotton and red and the sandy loams are found mostly in the middle and eastern portion of the Division. The Saline and Alkaline soils are also found but to a lesser extent.

The prominent geological formations are Archean Granites and Gneisses, the Deccan trap and the Gondwana sand stones. The lower Gondwanas bear coal seams which are being mined by Singareni Collieries Company Limited in the Bellampally-Mancherial belt. The Division has rich reserves of coal, lime stone and clays.

The population of the Division is 0.40 million (2011 Census). The per capita forest area is **0.37 Ha**. The population density is 116 persons per Km².

Table 4.2.1: Land use pattern (for entire Geographical area)

Land use	Area in Km²	Percentage
Forest including Scrub	1040.56	23.63%
Agriculture	1555.51	35.32%
Land with Scrub	126.72	2.88%
Fallow Lands	7.24	0.16%
Grasslands	0.1	0.00%
Settlements	11.18	0.25%
Vegetation outside Forest	93.92	2.13%
Water Bodies	80.92	1.84%
Total	**2916.15**	**100.00%**

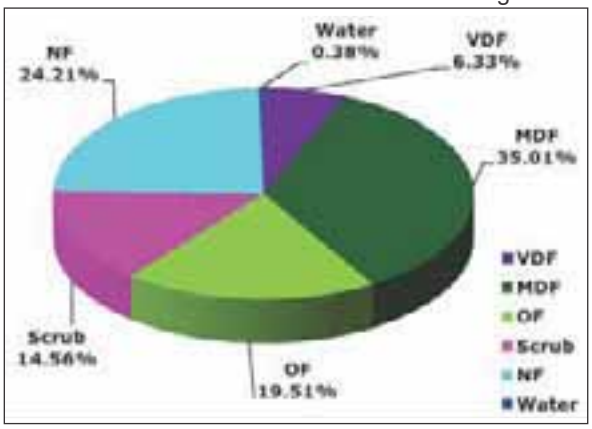
Source: As per LULC map prepared by NRSC, Hyderabad in 2007

4.2.2. Recorded Forest Area:

The area of notified forests of the Division is **1179.26 Km²** which is **40.44%** of the geographical area. Reserved, Protected and un-classed forests comprise of **976.44 Km²** (82.80%), **163.58 Km²** (13.87%) and **39.24 Km²** (3.33%)of the forest area respectively.

As per Champion and Seth's classification the Forests of Division fall under Tropical Dry Deciduous forests but for the convenience of forest management classified as Teak forests and Mixed forests.

Fig 4.2.1



4.2.3. Protected Area:

There is no Protected Area in the Division.

4.2.4. Community Forest Management:

There are 201 Vana Samrakshana Samities (VSSs) or Joint Forest Protection Committees (JFPCs) in the Division. An area of **178.30 Km²** forests, which is **15.12%** of the notified forests, is under the management of the VSSs.

4.2.5. Forest Cover:

The forest cover in the Division based on the

interpretation of IRS R2 LISS-III 2013 data (Dec 2013) and LISS-IV data (2011-2014) is **707.93 Km²** which is **24.28%** of the geographical area. In terms of the forest canopy density classes the Division has **73.60 Km²** of Very Dense Forests, **407.30 Km²** of Moderately Dense Forests and **227.03 Km²** of Open Forests. The area of the Scrub is **169.46 Km²**, Non-Forest **281.64 Km²** and Water Bodies **4.46 Km²**. The distribution of the forest cover of the division is shown in Fig 4.2.1.

4.2.6. Change in Forest Cover

The Satellite images of 2012 and 2013 are shown in Figures (4.2.2 & 4.2.3) and the changes between this period are shown on the image of 2013.

Fig 4.2.2: LISS-III Imagery of Bellampalli Division of Oct. 2012

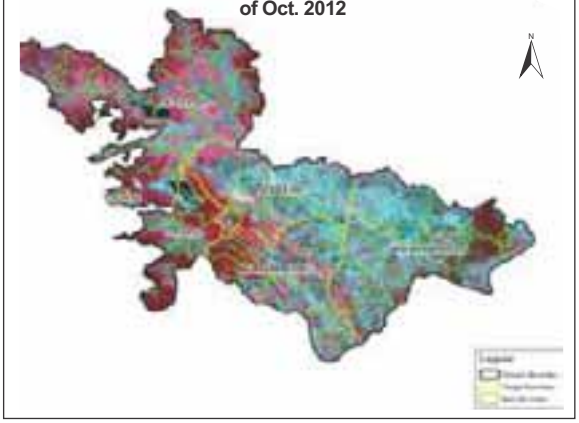
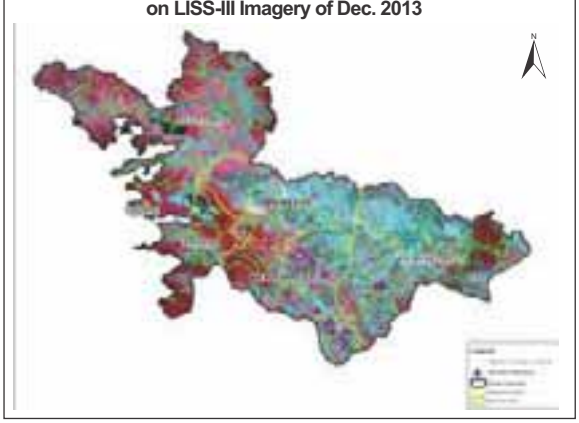


Fig 4.2.3: Vegetation Change Locations of Bellampalli Division on LISS-III Imagery of Dec. 2013



Comparison of the current forest cover with that of previous assessment year shows a negative change of **130.85 Ha**. However, including the scrub, the total negative change comes to **359.47 Ha**. The forest cover change matrix given in Table 4.1.2 reveals the changes from one class to another class.

The entire total negative change, is on account of clearance of jungle growth for raising of plantations. As clearance of jungle growth for raising of plantation is a management intervention the same is not considered as loss of forest cover. Only the negative change due to encroachments is taken as loss of forest cover. Therefore, there is no **net loss of forest in the Division.**

There are 47 Beats in the Division. Negative changes in forest cover are noticed in 7 Beats. There are no changes in remaining 40 Beats.

Details of forest cover in all Beats of the Division are shown in Table 4.2.3.

Table 4.2.2. Forest Cover Change Matrix: (Area in Km²)

2012	2013						Total of 2012
	VDF	MDF	OF	Scrub	NF	WATER	
Very Dense Forest	73.60	0.00	0.00	0.00	0.00	0.00	73.60
Moderately Dense Forest	0.00	407.30	0.00	0.94	0.00	0.00	408.24
Open Forest	0.00	0.00	227.03	0.00	0.37	0.00	227.40
Scrub	0.00	0.00	0.00	168.52	2.29	0.00	170.81
Non-Forest	0.00	0.00	0.00	0.00	278.98	0.00	278.98
Water	0.00	0.00	0.00	0.00	0.00	4.46	4.46
Total of 2013	**73.60**	**407.30**	**227.03**	**169.46**	**281.64**	**4.46**	**1163.49**
Net Change	0.00	-0.94	-0.37	-1.35	2.66	0.00	0.00

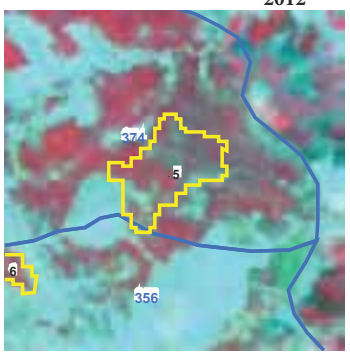
Table 4.2.3. Beat Wise Forest Cover: Area in Ha

Beat	VDF	MDF	OF	SF	NF	WB	Total	Net Change	Encr.
ASIFABAD RANGE									
Asifabad	58.34	634.09	409.28	367.52	457.99	62.58	1,989.80	0.00	0.00
Bambara	287.56	1105.54	534.96	303.76	1024.30	1.01	3,257.13	0.00	0.00
Chichpally	6.29	202.11	490.90	880.11	1611.99	2.80	3,194.21	0.00	0.00
Chirrakunta	43.56	610.92	373.58	338.97	282.79	0.34	1,650.16	0.00	0.00
Dantanpally	44.55	975.51	951.95	2232.39	893.00	10.62	5,108.02	0.00	0.00
Dhanora	0.20	65.21	86.84	115.07	181.98	0.17	449.46	0.00	0.00
Goyegoan	17.00	501.20	338.32	545.82	467.48	0.67	1,870.49	0.00	0.00
Indapur	8.96	434.00	450.62	451.36	1148.91	15.92	2,509.77	0.00	0.00
Indhani	6.98	176.05	274.61	544.64	1180.89	59.35	2,242.53	0.00	0.00
Kanergoan	307.18	536.61	181.22	80.35	467.33	0.23	1,572.92	0.00	0.00
Karangjiwada	14.76	917.18	1064.44	1336.88	3140.04	16.71	6,490.01	0.00	0.00
Keremeri	7.70	761.96	544.87	890.67	1235.47	28.83	3,469.49	0.00	0.00
Nawdhari	7.07	224.31	408.67	516.56	914.52	1.79	2,072.93	0.00	0.00
Sangvi	23.24	701.04	755.27	638.35	1717.66	1.99	3,837.54	0.00	0.00
Wankidi	14.08	217.73	434.00	618.23	1399.73	1.11	2,684.87	0.00	0.00
Welgi	362.27	1498.70	414.05	73.22	954.86	17.43	3,320.52	0.00	0.00
Total	**1209.76**	**9562.17**	**7713.56**	**9933.89**	**17078.94**	**221.55**	**45719.86**	**0.00**	**0.00**
BELLAMPALLY RANGE									
Adilpet	128.92	936.44	522.68	237.42	113.86	1.89	1,941.21	0.00	0.00
Bellampally	60.53	541.89	1002.09	532.04	644.18	7.32	2,788.04	-45.18	0.00
Dharmaraopet	610.22	755.23	222.23	93.38	61.57	21.30	1,763.93	0.00	0.00
Madaram	220.56	1033.33	419.90	78.55	185.90	0.07	1,938.32	0.00	0.00
Murliguda	346.16	1541.31	499.75	157.50	331.50	0.02	2,876.23	0.00	0.00
Narwaipet	75.11	808.09	543.34	284.60	320.83	3.64	2,035.61	-143.25	0.00
Rallapet	0.60	350.31	518.45	228.28	188.86	1.27	1,287.77	-44.06	0.00
Tandur	114.57	719.69	456.18	123.50	71.21	1.57	1,486.71	-27.77	0.00
Venkatapur	550.76	1059.85	277.41	104.03	47.21	0.21	2,039.47	0.00	0.00
Total	**2107.43**	**7746.14**	**4462.03**	**1839.31**	**1965.11**	**37.28**	**18157.30**	**-260.26**	**0.00**
KUSHNEPALLY RANGE									
Girelly	0.04	17.37	115.51	122.01	327.66	3.02	585.60	0.00	0.00
Gopalpet	906.11	2829.99	184.48	20.68	99.19	0.56	4,041.01	0.00	0.00
Hathni	0.16	23.24	299.05	470.59	900.09	1.23	1,694.35	0.00	0.00
Kushnepally	19.28	820.20	560.60	150.42	262.61	3.38	1,816.49	0.00	0.00
Lingala	17.68	956.55	497.06	141.94	149.36	0.83	1,763.42	0.00	0.00
Nagaram	44.94	1703.78	473.21	55.92	244.50	0.22	2,522.57	0.00	0.00
Nennel	142.05	800.50	366.95	81.06	60.05	1.87	1,452.48	0.00	0.00
Rampur	317.77	1238.43	124.58	28.07	89.26	0.10	1,798.21	0.00	0.00
Rangapet	68.18	1142.71	736.33	233.18	830.74	53.72	3,064.86	0.00	0.00
Rebbena[kpl]	24.09	955.48	880.38	239.59	429.05	0.31	2,528.91	-74.73	0.00
Vemanpally	469.76	3364.96	1217.14	177.87	409.26	8.74	5,647.74	-11.18	0.00
Total	**2010.06**	**13853.22**	**5455.29**	**1721.34**	**3801.77**	**73.97**	**26915.65**	**-85.91**	**0.00**

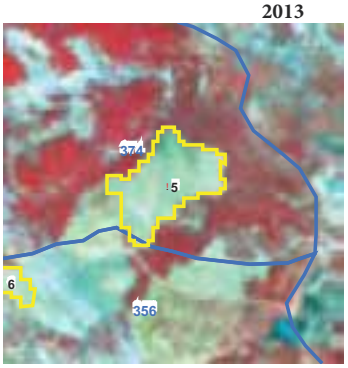
REBBENA RANGE									
Abbapur	103.48	660.85	357.66	86.34	522.85	9.89	1,741.07	0.00	0.00
Ameenguda	212.65	896.72	265.63	54.46	34.95	0.02	1,464.43	-13.30	0.00
Dharmaram	2.42	552.03	999.97	467.42	881.06	19.11	2,921.99	0.00	0.00
Edulawada	538.41	722.48	226.66	124.56	256.89	0.21	1,869.20	0.00	0.00
Rebbena	5.50	81.27	173.43	83.16	1114.35	2.70	1,460.40	0.00	0.00
Takkallapally	4.09	416.18	420.76	99.74	401.29	1.45	1,343.50	0.00	0.00
Total	**866.53**	**3329.52**	**2444.10**	**915.67**	**3211.39**	**33.38**	**10800.60**	**-13.30**	**0.00**
TIRYANI RANGE									
Devaiguda	500.69	1450.22	284.12	233.27	265.79	61.50	2,795.59	0.00	0.00
Gudipet	14.21	467.15	244.22	746.53	883.02	5.64	2,360.77	0.00	0.00
Gundal[east]	150.65	1298.60	685.81	185.01	97.81	0.03	2,417.91	0.00	0.00
Irkepally	79.37	838.94	444.00	877.16	346.31	0.77	2,586.55	0.00	0.00
Kannepally	264.18	1571.51	743.11	336.93	272.16	0.62	3,188.53	0.00	0.00
Meddi	157.12	612.15	226.98	156.87	241.87	11.27	1,406.26	0.00	0.00
Total	1166.22	6238.58	2628.24	2535.77	2106.96	79.83	14755.60	0.00	0.00
Division Total	**7360.00**	**40729.64**	**22703.21**	**16945.98**	**28164.17**	**446.00**	**116349.00**	**-359.47**	**0.00**

Satellite Imageries

2012



2013



Longitude	79.57226 ° E
Latitude	19.00964 ° N
Area in Ha	20.56
Change	SF to NF
Comp No.	374
Beat	Narwaipet
Range	Bellampally
Division	**Bellampally**



4.3 KAGAZNAGAR DIVISION

4.3.1. Introduction

Kagaz Nagar Forest Division lies in the North Eastern side of Adilabad District between latitudes 19^0 11' 51" N and 19^0 36' 20" N and longitudes 79^0 22' 28" E and 79^0 58' 21" E. Geographical area of the Division is **1645.05 Km²** which is**10.20%** of the area of the District. The important rivers and streams of the Division are Wardha, Pranahitha and Peddavagu, which finally join River Godavari.

Land use pattern of the Division is given in Table 4.3.1.

The climate of the Division is generally dry and hot. The temperatures vary from 15^0C to 40^0C. The normal Annual rainfall of the Division is 904 mm, received mainly from south-west monsoons.

The rock formations in the Division are Archaean Granites and Gneiss, the Deccan trap and the Gondwana sand stones. Soils formed from these rocks support good Teak forests. Soil types are Black cotton, Chalka and Red loams, Sandy loams, Saline and Alkaline.

The total population of the Division is 0.25 million (2011 Census). The Per capita forest area is **0.35 Ha**. The population density is 155persons per Km².

4.3.2. Recorded Forest Area:

The notified forest area of the Division is **858.81 Km²** which is **52.21%** of the geographical area. Reserved, Protected and Un-classed Forests constitute **650.62 Km²** (75.76%), **206.58 Km²** (24.05%) and **1.61 Km²** (0.19%)of the forest area respectively.

As per Champion and Seth's classification the forests of Division fall under Tropical Dry Deciduous & Bamboo Mixed Forests.

Table 4.3.1: Land use pattern (for entire Geographical area)

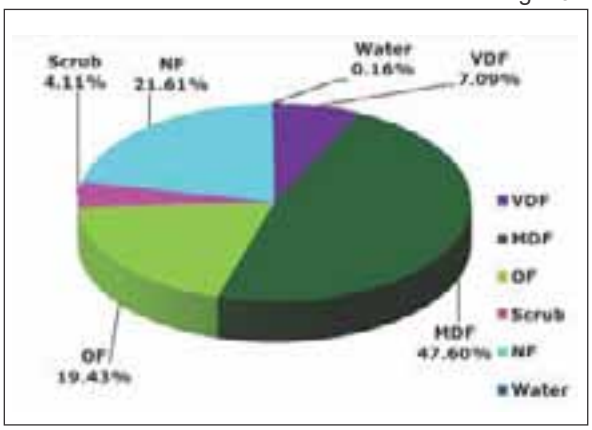
Land use	Area in Km²	Percentage
Forest including Scrub	777.61	47.27%
Agriculture	706.05	42.92%
Land with Scrub	72.37	4.40%
Fallow Lands	11.61	0.71%
Settlements	8.51	0.52%
Vegetation outside Forest	34.68	2.11%
Water Bodies	34.22	2.08%
Total	**1645.05**	**100.00**

Source: As per LULC map prepared by NRSC, Hyderabad in 2007

4.3.3. Protected Area:

There is no Protected Area in the Division. However certain parts of the division fall in the wildlife corridor linking **Kawal Tiger Reserve & Tadoba Andhari Tiger Reserve (M.H)**. A portion of **Bejjur Range** has been proposed to be notified as conservation Reserve for converting the vultures.

Fig 4.3.1



4.3.4. Community Forest Management:

There are 113 Vana Samrakshana Samities (VSSs) in the Division.**148.42 Km²** forest area, which is **17.27%** of the forest area, is under the management of the VSSs.

4.3.5. Forest Cover:

The forest cover in the Division, based on the interpretation of IRS R2 LISS-III 2013 data (Oct 2013) and LISS-IV data (2011-2014) is **662.14 Km²** which is **40.25%** of the Geographical area. In terms of the forest canopy density classes, the Division has **63.37 Km²** of

Very Dense Forests, **425.21 Km²** of Moderately Dense Forests and **173.56 Km²** of Open Forests. The area of the Scrub is **36.69 Km²**, Non-Forests **193.04 Km²** and Water Bodies **1.42 Km²**. The distribution of the forest cover of the division is shown in Fig 4.3.1.

4.3.6. Change in Forest Cover

The Satellite images of 2012 and 2013 are shown in Figures 4.3.2 & 4.3.3 respectively and the changes during this period are shown on the image of 2013.

Fig 4.3.2: LISS-III Imagery of Kagaznagar Division of Oct. 2012

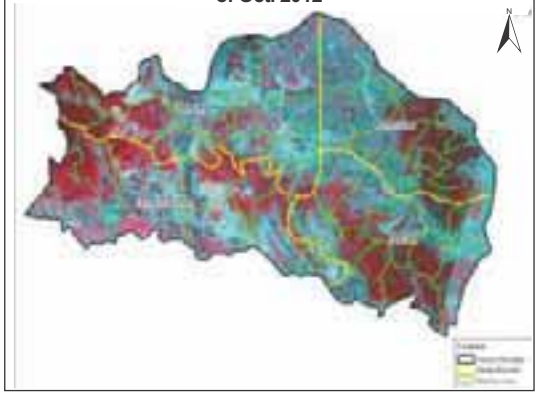
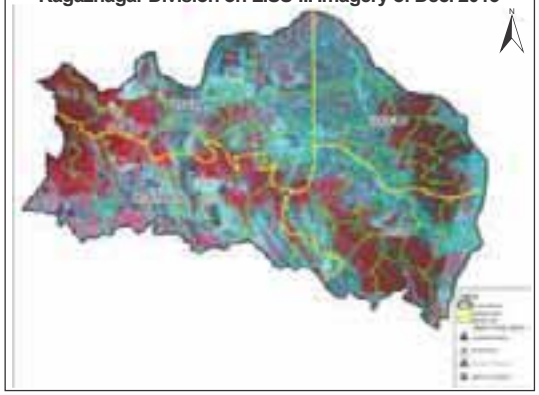


Fig 4.3.3: Vegetation Change Locations of Kagaznagar Division on LISS-III Imagery of Dec. 2013



Comparison of the current forest cover with that of previous assessment year shows a **negative change of 31.21 Ha**. However, including the scrub, total **Positive change comes 52.58 Ha** and the **total negative change** comes to **87.15 Ha**. The forest cover change matrix given in Table 4.3.2 reveals the changes from one class to another class.

The entire total Positive change is on account of growth in plantations raised. Out of the total negative change including scrub, **36.47 Ha** is on account of carrying advance operations for raising of plantation, **43.89 Ha** is on account of harvesting of plantations and **6.79 Ha** is on account of encroachments. As advance operations and harvesting of plantations etc. are forest management interventions; the same are not considered as loss of forest cover. Hence the negative change on account of encroachments alone is taken as loss of forest cover. Therefore, the **net loss of forest in the Division 6.79 Ha** only.

There are 39 Beats in the Division. Negative changes in Forest Cover are noticed in 6 Beats and positive change in 3 Beats. There are no changes in remaining 30 Beats.

Details of forest cover in all Beats of the Division are shown in Table 4.3.3.

Table 4.3.2. Forest Cover Change Matrix: (Area in Km²)

2012	2013						Total of 2011
	VDF	MDF	OF	Scrub	NF	WATER	
Very Dense Forest	63.37	0.00	0.00	0.00	0.00	0.00	63.37
Moderately Dense Forest	0.00	425.21	0.00	0.10	0.00	0.00	425.31
Open Forest	0.00	0.00	173.56	0.00	0.21	0.00	173.77
Scrub	0.00	0.00	0.00	36.06	0.56	0.00	36.62
Non-Forest	0.00	0.00	0.00	0.53	192.27	0.00	192.80
Water	0.00	0.00	0.00	0.00	0.00	1.42	1.42
Total of 2013	**63.37**	**425.21**	**173.56**	**36.69**	**193.04**	**1.42**	**893.29**
Net Change	0.00	-0.10	-0.21	0.07	0.24	0.00	0/.00



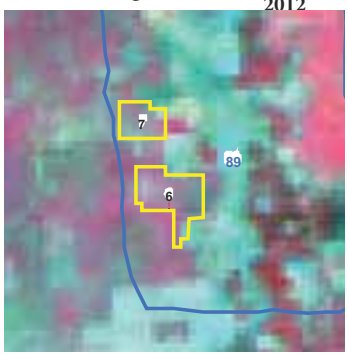
Table 4.3.3. Beat Wise Forest Cover: Area in Ha

Beat	VDF	MDF	OF	SF	NF	WB	Total	Net Change	Encr.
BIJJUR RANGE									
Bijjur	148.16	1,575.05	425.98	70.72	618.63	0.00	2,838.54	0.00	0.00
Ellur	691.23	1,526.91	168.15	11.14	30.88	0.00	2,428.30	0.00	0.00
Gundepally	426.47	1,881.89	545.71	53.51	192.16	0.96	3,100.69	0.00	0.00
Indergaon	5.45	589.52	582.11	29.90	149.95	0.00	1,356.93	0.00	0.00
Kondapally	159.91	973.79	477.07	125.82	896.31	0.59	2,633.48	0.00	0.00
Kuntalamanepally	50.36	797.57	109.55	18.23	977.62	0.70	1,954.03	0.00	0.00
Lodpally	275.01	982.72	213.39	47.84	105.43	1.25	1,625.64	0.00	0.00
Mogelly	29.78	907.42	308.07	49.58	529.50	0.84	1,825.18	0.00	0.00
Murliguda	56.45	1,576.05	863.59	186.79	303.00	1.94	2,987.81	0.00	0.00
Papanpet	74.80	1,390.66	253.40	23.21	480.35	5.74	2,228.16	0.00	0.00
Sulgupally	111.74	913.41	115.98	12.24	1,020.35	2.44	2,176.17	-1.69	1.69
Total	**2,029.36**	**13,114.97**	**4,063.00**	**628.96**	**5,304.20**	**14.45**	**25,154.93**	**-1.69**	**1.69**
KAGAZNAGAR RANGE									
Ankoda	369.90	1,318.27	416.94	115.97	200.84	0.49	2,422.41	-2.16	0.00
Bombaiguda	18.88	450.21	378.08	192.09	355.92	1.97	1,397.16	0.00	0.00
Chedwai	252.51	1,359.56	565.73	176.13	656.25	85.88	3,096.06	0.00	0.00
Kadamba	163.38	1,926.39	728.68	85.35	247.08	0.00	3,150.87	-14.37	0.00
Korsini	429.77	1,769.01	582.45	123.58	505.41	3.49	3,413.71	0.00	0.00
Kothapet	455.76	1,818.39	745.10	202.78	444.63	1.98	3,668.62	-15.70	0.00
Raspalli	27.38	484.32	523.87	296.55	425.32	2.73	1,760.18	-2.94	0.00
Vempalli	692.60	1,432.68	674.57	99.32	271.28	1.44	3,171.89	-5.10	5.10
Total	**2,410.17**	**10,558.83**	**4,615.41**	**1,291.77**	**3,106.74**	**97.99**	**22,080.91**	**-40.27**	**5.10**
KARJELLI RANGE									
Ankoda	2.31	182.03	156.37	7.83	868.19	0.51	1,217.24	0.00	0.00
Dimda	6.10	540.84	167.56	11.51	934.55	0.06	1,660.63	0.00	0.00
Gudem	64.30	1,683.68	603.39	78.18	877.07	0.08	3,306.70	0.00	0.00
Gudlabori	0.81	26.11	45.79	9.77	894.20	0.00	976.68	0.00	0.00
Karjelly	42.73	1,192.05	296.11	12.00	434.81	0.00	1,977.71	0.00	0.00
Katepally	55.75	1,011.07	370.20	71.46	365.36	0.00	1,873.83	0.00	0.00
Keethani	20.38	1,253.63	182.11	4.03	134.18	0.18	1,594.50	0.00	0.00
Korsana	18.80	1,222.30	410.06	54.60	237.61	0.03	1,943.38	0.00	0.00
Kukuda	116.26	1,060.46	428.70	71.05	125.34	7.08	1,808.90	0.00	0.00
Total	**327.44**	**8,172.17**	**2,660.28**	**320.42**	**4,871.31**	**7.94**	**16,359.57**	**0.00**	**0.00**
SIRPUR RANGE									
Bhupal_patnam	18.43	920.45	452.09	72.49	118.21	0.28	1,581.94	1.75	0.00
Cheelapally	344.89	2,109.73	1,037.20	107.61	840.47	0.10	4,440.00	0.00	0.00
Chintakunta	92.54	987.69	511.92	100.66	188.92	0.13	1,881.87	0.00	0.00
Dabba	7.41	276.95	270.75	112.23	854.22	0.00	1,521.56	0.00	0.00
Kanki	11.41	422.15	357.56	88.15	941.51	0.25	1,821.02	0.00	0.00

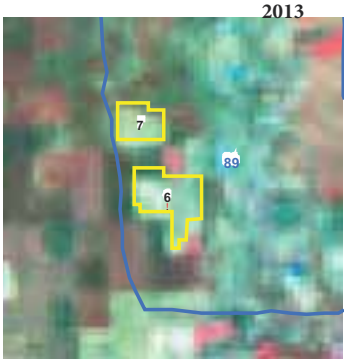
Loanvelly	23.00	489.48	522.70	225.40	296.16	0.27	1,557.02	5.64	0.00
Makodi	432.20	1,238.93	704.10	145.60	1,132.43	0.84	3,654.10	0.00	0.00
Malini	477.59	1,770.60	404.72	78.37	213.88	0.00	2,945.16	0.00	0.00
Muthampet	34.52	811.60	842.49	253.70	640.15	3.29	2,585.75	0.00	0.00
Rebbena	118.74	960.90	263.88	52.70	472.97	0.03	1,869.22	0.00	0.00
Sirpur	9.31	686.68	649.99	191.19	323.37	16.43	1,876.97	0.00	0.00
Total	**1,570.04**	**10,675.14**	**6,017.41**	**1,428.10**	**6,022.29**	**21.62**	**25,734.61**	**7.39**	**0.00**
Division Total	**6,337.00**	**42,521.11**	**17,356.10**	**3,669.25**	**19,304.54**	**142.00**	**89,330.01**	**-34.57**	**6.79**

Satellite Imageries

2012



2013



Longitude	79.56315 ° E
Latitude	19.39380 ° N
Area in Ha	3.46
Change	SF to NF
Comp No.	89
Beat	Vempalli
Range	Kagaznagar
Division	**Kagaznagar**



4.4 MANCHERIAL DIVISION

4.4.1. Introduction

Mancherial Forest Division lies in the south-eastern part of Adilabad District between latitudes 18°40' 10" N and 19°8' 42" N and longitudes 79°10' 15" E and 79°57' 53" E. Geographical area of the Division is **2347.64 Km²** which is **14.56%** of the area of the District. The elevation of hill ranges varies from 135 m–540 m above MSL. The highest point in the Division is 556 m above MSL. Godavari and Pranahita are the major rivers of the Division. River Pranahita forms eastern boundary and the River Godavari forms southern boundary of the Division.

Land use pattern of the Division is given in Table 4.4.1.The temperature varies from 15°C to 40°C. The average annual rainfall of the Division is 1100 mm received mainly from south-west monsoon.

The soils of Mancherial Division range from Black cotton, Chalka, sandy loam, Red loam to saline and alkaline. The Black cotton, Chalka and Red loamy soils are found throughout the Division and the sandy loams are found mostly in the middle portion of the Division. Coal is found in the Barakar sand stone of Gondwanas and the limestone deposits are found in Rally block, well suited for cement manufacture.

Population of the Division is 0.56 million (2011 Census),per capita forest area is **0.20 Ha** and the population density is 261 persons per Km².

4.4.2. Recorded Forest Area:

The notified forest area of the Division is **1205.83 Km²** which is **51.85 %** of the geographical area. Reserved, Protected and Un-classed Forests constitute **1180.64 Km²** (97.91%), **24.09 Km²** (2.00%) and **1.10 Km²** (0.09 %) of the forest area respectively.

As per Champion and Seth's classification the Forests of this Division fall under Tropical Dry Deciduous & Bamboo Mixed Forests (Dry Teak bearing Forests, Dry Mixed Forests).

Table 4.4.1: Land use pattern (for entire Geographical area)

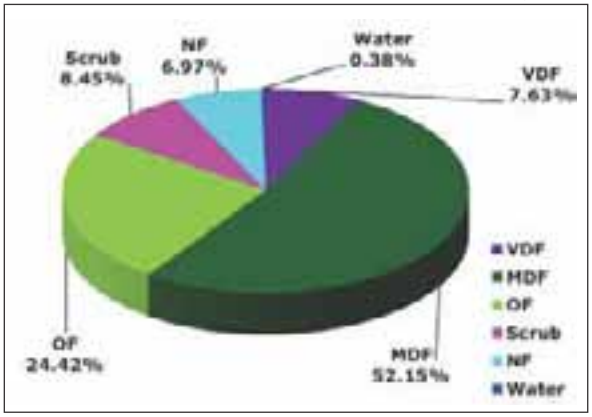
Land use	Area in Km²	Percentage
Forest including Scrub	1026.02	43.70%
Agriculture	983.23	41.88%
Land with Scrub	134.86	5.74%
Fallow Lands	63.42	2.70%
Settlements	13.76	0.59%
Vegetation outside Forest	65.25	2.78%
Water bodies	61.10	2.60%
Total	**2347.64**	**100.00**

Source: AS per LULC map prepared by NRSC, Hyderabad in 2007

4.4.3. Protected Area:

There are 2 Protected Areas in the Division. The **Pranahita Wild Life Sanctuary** with an area of **68.37 Km²** or **2.9%** of the geographic area of the Division, and a part of **Shivaram Wild Life Sanctuary** which includes 2 Beats of the Division with an area of **14.23 Km²**.

Fig 4.4.1



4.4.4. Community Forest Management:

There are 113 Vana Samrakshana Samities (VSSs) in the Division.**137.67 Km²** or **11.41%** of notified forest area is under the management of VSSs.

4.4.5. Forest Cover:

The forest cover in the Division based on the interpretation of IRS R2 LISS III 2013data (Dec 2013)and

LISS IV data (2011-2014) is **939.20 Km²** which is **40.01%** of the Geographical area. In terms of the forest canopy density classes, the Division has **85.11 Km²** of Very Dense Forests, **581.67 Km²** of Moderately Dense Forests and **272.42 Km²** of Open Forests. The area of the Scrub is **94.2 Km²**, Non-Forest **77.72 Km²** and Water Bodies **4.24 Km²**. The distribution of the forest cover of the division is shown in Fig 4.4.1.

4.4.6. Change in Forest Cover

The Satellite images of 2012 and 2013 are shown in Figures 4.4.2 & 4.4.3 respectively and the changes during this period are shown on the image of 2013.

Fig 4.4.2: LISS-III Imagery of Mancherial Division of Oct. 2012

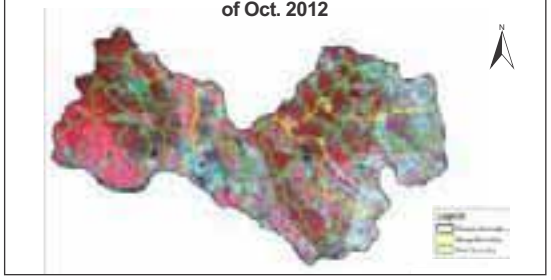
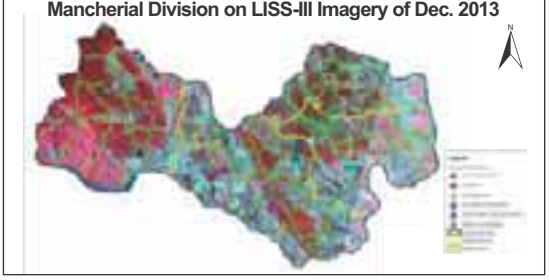


Fig 4.4.3: Vegetation Change Locations of Mancherial Division on LISS-III Imagery of Dec. 2013



Comparison of the current forest cover with that of previous assessment year shows a positive change of **119.53 Ha** and is a negative change of **242.47 Ha**. However, including the scrub, the positive change comes to **352.02 Ha** and the negative change **330.01 Ha**.The forest cover change matrix given in Table 4.4.2 reveals the changes from one class to another class.

Out of the total positive including scrub, **279.10 Ha** is on account of growth in plantations raised, **72.92 Ha** is improvement of forest due to protection and management interventions. Out of the total negative change including scrub, **232.19 Ha** is on account of carrying advance operations for raising of plantation, **66.72 Ha** is on account of harvesting of plantations, **29.11 Ha** is an account of diversion of forest lands for non-forestry purpose and **1.99 Ha** is on account of encroachments. As advance operations and harvesting of plantations, diversion of forest lands etc. are forest management interventions; the same are not considered as loss of forest cover. Hence the negative change on account of encroachments alone is taken as loss of forest cover. Therefore, **the net loss of forest in the Division 1.99 Ha** only.

There are 50 Beats in the Division. Negative changes in the forest cover are noticed in 7 Beats and positive change in 10 Beats. There are no changes in remaining 33 Beats.

Details of forest cover in all Beats of the Division are shown in Table 4.4.3.

Table 4.4.2. Forest Cover Change Matrix: (Area in Km²)

2012	2013						Total of 2012
	VDF	MDF	OF	Scrub	NF	WATER	
Very Dense Forest	85.11	0.00	0.00	0.00	0.00	0.00	85.11
Moderately Dense Forest	0.00	581.32	0.00	0.81	0.00	0.00	582.13
Open Forest	0.00	0.00	271.57	0.70	0.92	0.00	273.19
Scrub	0.00	0.35	0.85	90.38	0.88	0.00	92.46
Non-Forest	0.00	0.00	0.00	2.32	75.92	0.00	78.24
Water	0.00	0.00	0.00	0.00	0.00	4.24	4.24
Total of 2013	**85.11**	**581.67**	**272.42**	**94.21**	**77.72**	**4.24**	**1115.37**
Net Change	0.00	-0.46	-0.77	1.75	-0.52	0.00	0.00

Table 4.4.3. Beat Wise Forest Cover: Area in Ha

Beat	VDF	MDF	OF	SF	NF	WB	Total	Net Change	Encr.
CHENNUR RANGE									
Annaram	187.87	1,213.96	328.40	70.78	120.27	1.94	1,923.22	0.00	0.00
Chinnoor	247.76	1,742.46	525.98	205.91	94.31	4.31	2,820.74	0.00	0.00
Kistampet	660.02	1,831.49	793.11	327.47	173.71	5.91	3,791.71	0.00	0.00
Kotpally	213.07	1,579.29	865.95	241.70	104.06	2.17	3,006.23	45.92	0.00
Lingannapet	511.12	957.57	168.36	41.85	40.97	1.97	1,721.84	0.00	0.00
Nagampet	243.23	1,184.61	242.79	53.28	288.38	1.97	2,014.27	0.00	0.00
Perpally	119.99	1,176.95	278.26	37.17	170.18	2.27	1,784.82	0.00	0.00
Pongain_somaram	327.68	1,246.99	414.94	120.33	77.96	0.25	2,188.16	0.00	0.00
Sirsa	74.07	776.46	376.32	113.03	182.54	9.83	1,532.24	0.00	0.00
Venkatapur	465.15	1,659.57	462.52	144.76	63.03	0.00	2,795.03	0.00	0.00
Total	**3,049.96**	**13,369.35**	**4,456.63**	**1,356.28**	**1,315.41**	**30.62**	**23,578.26**	**45.92**	**0.00**
LUXETTIPET RANGE									
Devapur	159.51	1,954.47	1,438.30	616.15	341.91	6.63	4,516.98	0.00	0.00
Gadpur	42.13	882.03	706.14	334.19	93.26	0.31	2,058.07	0.00	0.00
Hanmanthpally	201.94	2,129.94	757.90	53.80	13.57	0.05	3,157.20	0.00	0.00
Karichelma	488.77	1,219.92	315.01	59.06	26.13	0.00	2,108.89	0.00	0.00
Medaram	90.78	800.44	504.59	246.34	123.66	2.16	1,767.98	0.00	0.00
Mulkalla	13.37	536.57	718.66	363.28	80.82	140.66	1,853.36	0.00	0.00
Muthampelly	174.23	1,352.39	755.23	294.61	102.02	0.74	2,679.20	0.00	0.00
Old_mancherial	10.31	498.41	646.21	387.97	125.52	0.40	1,668.82	0.00	0.00
Peddampet	265.20	1,188.98	417.03	167.33	25.01	0.33	2,063.88	0.00	0.00
Rally	24.38	1,266.00	1,211.65	256.72	75.23	2.05	2,836.02	0.00	0.00
Sonapur	408.73	2,207.89	760.19	232.38	226.84	1.90	3,837.93	0.00	0.00
Teekannapally	46.95	1,663.41	1,749.71	645.43	94.17	0.46	4,200.13	0.00	0.00
Venkatapur	262.06	964.57	401.80	74.62	36.37	0.04	1,739.45	0.00	0.00
Total	**2,188.36**	**16,665.02**	**10,382.42**	**3,731.88**	**1,364.51**	**155.73**	**34,487.91**	**0.00**	**0.00**
MANCHERIAL RANGE									
AREPALLY	29.40	1,018.18	593.15	223.51	82.68	0.57	1,947.48	0.00	0.00
ASNAD	116.97	1,672.65	687.56	273.06	207.63	0.60	2,958.46	0.00	0.00
AUDAM	164.15	696.36	223.56	80.87	37.95	0.00	1,202.88	6.56	0.00
BHEEMARAM	78.51	794.99	625.29	282.33	184.64	53.72	2,019.48	0.00	0.00
BURGUPALLY	177.77	1,140.57	444.12	158.33	94.96	142.78	2,158.53	0.00	0.00
DAMPUR	133.09	1,285.70	334.45	53.56	16.57	0.52	1,823.89	0.00	0.00
GUDIPALLY	433.31	908.56	263.62	124.17	40.61	0.82	1,771.10	0.00	0.00
INDARAM	26.63	672.28	732.34	455.71	356.30	0.82	2,244.08	-15.00	0.00
JAIPUR	174.94	601.02	257.82	104.49	49.58	5.41	1,193.27	7.81	0.00
KUNDARAM	325.17	1,076.57	389.37	173.55	66.68	0.68	2,032.02	47.29	0.00
MANCHERIAL	41.85	699.14	579.85	351.75	595.00	5.85	2,273.43	-70.09	0.00
MANDAMARRI	4.38	83.63	322.82	104.21	604.90	6.30	1,126.24	3.77	0.00
PEGADAPALLY	166.97	890.89	405.96	172.73	168.12	1.24	1,805.90	17.71	1.99
PONNOOR	199.78	1,048.37	342.01	123.00	26.09	0.80	1,740.03	0.00	0.00

SARANGAPALLY	53.56	716.60	647.63	363.19	621.04	1.69	2,403.71	65.21	0.00
SOMANPALLY	30.93	521.23	469.46	339.76	169.22	0.76	1,531.36	0.00	0.00
Total	**2,157.41**	**13,826.74**	**7,319.01**	**3,384.22**	**3,321.97**	**222.56**	**30,231.86**	**63.26**	**1.99**
NEELWAI RANGE									
Bopparam	90.01	1,034.07	260.38	55.52	102.88	0.19	1,543.03	0.00	0.00
Karji	65.66	1,131.57	236.88	28.91	163.28	0.05	1,626.35	0.00	0.00
Katepally	86.31	1,189.37	337.17	78.51	84.01	0.75	1,776.11	-18.84	0.00
Kothur	209.16	1,514.24	569.42	118.07	154.31	0.30	2,565.50	10.92	0.00
Mailaram	325.21	1,404.87	495.15	100.16	109.15	0.72	2,435.26	0.00	0.00
Mallampet	70.33	1,636.70	454.52	64.01	75.49	0.57	2,301.62	0.00	0.00
Nakkalapally	56.13	1,193.96	265.03	16.26	95.83	0.27	1,627.50	0.00	0.00
Neelwai	25.90	915.78	557.94	137.96	89.17	1.20	1,727.96	0.00	0.00
Sawanpally	61.06	1,095.79	345.54	44.91	436.48	0.00	1,983.79	0.00	0.00
Shankaparur	95.64	1,741.01	646.19	133.24	85.99	0.52	2,702.59	-79.25	0.00
Venchapally	29.86	1,448.04	916.16	170.93	373.75	10.54	2,949.27	0.00	0.00
Total	**1,115.27**	**14,305.40**	**5,084.38**	**948.48**	**1,770.34**	**15.11**	**23,238.98**	**-87.17**	**0.00**
Division Total	**8,511.00**	**58,166.51**	**27,242.44**	**9,420.86**	**7,772.23**	**424.02**	**111,537.01**	**22.01**	**1.99**

Satellite Imageries

2012



2013



Longitude	79.66025 ° E
Latitude	18.78656 ° N
Area in Ha	34.63
Change	SF to DF
Comp No.	36
Beat	Kundaram
Range	Mancherial
Division	**Mancherial**



4.5 KAWAL TR EAST (JANNARAM) DIVISION

4.5.1. Introduction

Kawal TR East (Jannaram) Division lies in the central portion of Adilabad District between latitudes 18^0 55' 12" N and 19^0 26' 49"N and longitudes $78^0$42'52" E and 79^0 15' 32" E. Geographical Area of the Division is **1550.34 Km^2** which is **9.61%** of the geographical area of the District. The north western corner of this Division is Birsaipet plateau which is 396 m above MSL. This plateau is all undulating and drains from either side into Peddavagu stream which runs across the plateau from north-east to south-west.

Land use pattern of the Division is given in Table 4.5.1.

The temperature varies from 15^0C to 40^0C. Average annual Rainfall of the Division is 750 mm, received mainly from south-west monsoons.

In this Division about 30 seasonal streams are identified. The area serves as a catchment for many streams, which drain into Kaddam reservoir and Godavari River. There are a large number of small, medium and big tanks scattered through out the Division inside and outside the Reserve Forest. Red soils are extensive, followed by Black soils. Alluvial and laterite soils are found occasionally to a small extent.

Population of the Division is 0.10 million (2011 Census); Per capita forest area is **0.63 Ha** and the population density is 144 persons per Km^2.

4.5.2. Recorded Forest Area:

The notified forest area of the Division is **1218.74 Km^2** which is **78.62%** of the geographical area. Reserved and Protected Forests constitute **442.12 Km^2** (36.28 %) and **776.62 Km^2** (63.72 %) of the forest area respectively.

As per Champion and Seth's classification the forests of Division fall under Tropical Dry Deciduous& Bamboo Mixed Forests (Dry Teak bearing Forests and Dry Mixed Forests).

Table 4.5.1: Land use pattern (for entire Geographical area)

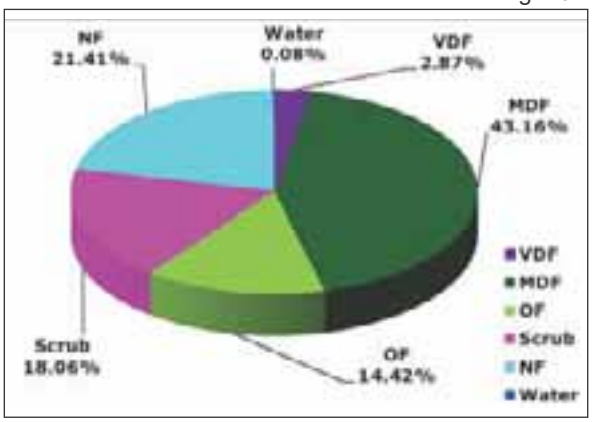
Land use	Area in Km^2	Percentage
Forest including Scrub	1212.97	78.24%
Agriculture	257.18	16.59%
Land with Scrub	19.22	1.24%
Fallow Lands	6.83	0.44%
Grasslands	0	0.00%
Settlements	13.53	0.87%
Vegetation outside Forest	15.6	1.01%
Water Bodies	25.01	1.61%
Total	**1550.34**	**100.00%**

Source: AS per LULC map prepared by NRSC, Hyderabad in 2007

4.5.3. Protected Area:

Large part of the **Kawal Wildlife Sanctuary & Tiger Reserve (TR)** falls in this Division. The entire notified forest area of the Division is included in **Kawal WLS & TR**.

Fig 4.5.1



4.5.4. Community Forest Management:

There are 133 Vana Samrakshana Samities (VSSs) or Joint Forest Protection Committees (JFPCs) in the Division. An area of **184.70 Km^2** forests which is **15.15%** of of the notified forests, is under the management of the VSSs /EDCs.

4.5.5. Forest Cover:

The forest cover in the Division, based on the

interpretation of IRS R2 LISS-III 2013 data (Dec 2013)and LISS-IV (2011-2014) is **752.30 Km²** which is **48.52%** of the Geographical area. In terms of the forest canopy density classes the Division has **35.78 Km²** of Very Dense Forests, **537.11 Km²** of Moderately Dense Forests and **179.41 Km²** of Open Forests. The area of the Scrub is **224.76 Km²**, Non-Forest **266.50 Km²** and Water Bodies **0.98 Km²**. The distribution of the forest cover of the division is shown in Fig 4.5.1.

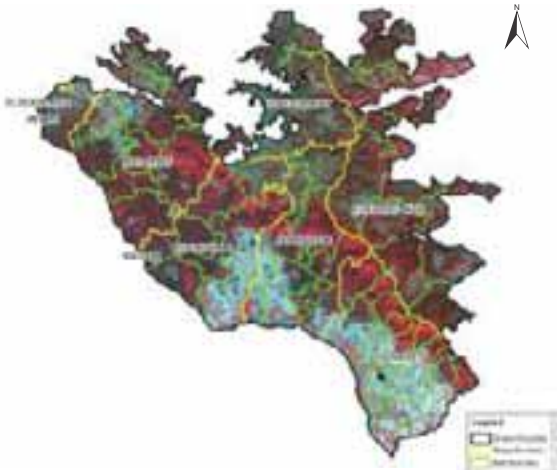
4.5.6. Change in Forest Cover

The Satellite images of the Division of 2012 and 2013 seasons are shown in Figures 4.5.2 & 4.5.3 respectively and the changes during this period are shown on the image of 2013.

Fig 4.5.2: LISS-III Imagery of Kawal TR East (Jannaram) Division of Oct. 2012



Fig 4.5.3: Vegetation Change Locations of Kawal TR East (Jannaram) Division on LISS-III Imagery of Dec. 2013



Comparison of the current forest cover with that of previous assessment year does not show any change. The forest cover change matrix given in Table 4.5.2 reveals the changes from one class to another class.

There are 65 beats in the Division. There are no changes in 65 Beats.

Details of forest cover in all Beats of the Division are shown in Table 4.5.3.

Table 4.5.2. Forest Cover Change Matrix: (Area in Km²)

2012	2013						Total of 2012
	VDF	MDF	OF	Scrub	NF	WATER	
Very Dense Forest	35.78	0.00	0.00	0.00	0.00	0.00	35.78
Moderately Dense Forest	0.00	537.11	0.00	0.00	0.00	0.00	537.11
Open Forest	0.00	0.00	179.41	0.00	0.00	0.00	179.41
Scrub	0.00	0.00	0.00	224.76	0.00	0.00	224.76
Non-Forest	0.00	0.00	0.00	0.00	266.50	0.00	266.50
Water	0.00	0.00	0.00	0.00	0.00	0.98	0.98
Total of 2013	**35.78**	**537.11**	**179.41**	**224.76**	**266.50**	**0.98**	**1244.54**
Net Change	0.00	0.00	0.00	0.00	0.00	0.00	0.00



Table 4.5.3. Beat Wise Forest Cover: Area in Ha

Beat	VDF	MDF	OF	SF	NF	WB	Total	Net Change	Encr.
ASIFABAD-KTR RANGE									
Balhanpur	10.31	293.83	350.57	343.55	511.91	0.08	1,510.25	0.00	0.00
Bhimrelly	38.21	817.48	367.66	1,080.58	634.49	0.29	2,938.71	0.00	0.00
Chintaguda	28.12	1,033.74	636.40	489.77	522.22	0.87	2,711.11	0.00	0.00
Chintalamadira	5.63	430.39	560.46	655.15	300.56	0.22	1,952.41	0.00	0.00
Dhanora	14.19	847.24	585.94	936.35	752.43	0.74	3,136.89	0.00	0.00
Ginnedhari	16.99	549.52	362.60	931.06	505.07	1.23	2,366.48	0.00	0.00
Gopera	39.54	1,478.44	561.48	713.11	746.65	1.79	3,540.99	0.00	0.00
Goyena	50.64	2,062.42	1,141.71	1,299.59	1,667.70	1.91	6,223.98	0.00	0.00
Gundal[west]	229.28	1,496.65	299.72	556.50	174.28	0.07	2,756.50	0.00	0.00
Kodanmovad[north]	20.50	723.68	420.41	473.16	295.32	1.65	1,934.73	0.00	0.00
Kodanmovad[south]	5.27	706.85	344.81	377.89	155.23	1.52	1,591.57	0.00	0.00
Mangi	236.22	1,985.80	260.84	285.77	240.92	0.04	3,009.58	0.00	0.00
Waudham	34.35	404.86	505.10	514.85	866.53	0.46	2,326.15	0.00	0.00
Total	**729.25**	**12,830.90**	**6,397.70**	**8,657.33**	**7,373.31**	**10.87**	**35,999.35**	**0.00**	**0.00**
BIRSAIPET RANGE									
Birsaipet-e	31.84	939.51	453.75	282.01	237.20	0.27	1,944.58	0.00	0.00
Birsaipet-w	14.35	1,232.69	658.85	314.95	411.63	6.77	2,639.25	0.00	0.00
Dantanpalli-e	68.14	1,003.85	459.81	346.59	1,036.48	0.22	2,915.09	0.00	0.00
Dantanpalli-w	3.14	318.75	375.51	276.04	1,410.46	0.11	2,384.02	0.00	0.00
Gandigopalpur	283.07	3,796.45	550.99	353.56	516.02	2.17	5,502.26	0.00	0.00
Maisampet	32.93	2,362.17	840.26	460.18	60.93	5.58	3,762.05	0.00	0.00
Rampur	31.62	1,441.19	529.79	173.42	28.69	0.55	2,205.27	0.00	0.00
Total	**465.09**	**11,094.61**	**3,868.96**	**2,206.75**	**3,701.41**	**15.67**	**21,352.52**	**0.00**	**0.00**
INDANPALLI RANGE									
Dosthnagar	1.20	847.42	111.25	471.19	74.21	2.61	1,507.88	0.00	0.00
Indanpalli	18.77	877.40	242.34	524.38	80.05	4.11	1,747.04	0.00	0.00
Islampur	123.78	2,099.39	523.77	330.75	225.50	1.59	3,304.79	0.00	0.00
Kalamadugu	3.68	133.79	142.63	143.64	785.92	0.74	1,210.42	0.00	0.00
Kalleda	53.35	1,645.17	205.74	457.86	70.02	3.25	2,435.40	0.00	0.00
Kawal	189.08	2,157.19	414.89	468.49	480.49	5.02	3,715.16	0.00	0.00
Kothapalli	71.94	416.43	104.71	153.85	1,258.36	0.10	2,005.40	0.00	0.00
Narlapur	3.22	1,430.25	128.60	431.73	42.01	6.77	2,042.58	0.00	0.00
Total	**465.02**	**9,607.04**	**1,873.93**	**2,981.89**	**3,016.56**	**24.19**	**17,968.67**	**0.00**	**0.00**
JANNARAM RANGE									
Alinagar	119.02	2,022.81	160.90	247.60	9.34	1.62	2,561.29	0.00	0.00
Chintaguda	5.46	731.72	105.94	284.83	52.31	2.91	1,183.17	0.00	0.00
Dongapalli	260.13	2,477.76	203.16	156.36	293.62	0.21	3,391.24	0.00	0.00

Jamuldhara	11.88	596.52	224.77	279.35	1,192.13	3.27	2,307.92	0.00	0.00
Jannaram	0.52	536.17	87.22	479.84	118.28	4.02	1,226.05	0.00	0.00
Kistapur	77.55	1,096.18	144.34	239.94	320.92	2.03	1,880.95	0.00	0.00
Mamidipalli	36.34	246.68	109.95	118.72	1,063.48	9.64	1,584.80	0.00	0.00
Paidipalli	0.47	647.98	104.17	270.92	42.15	2.74	1,068.43	0.00	0.00
Total	**511.37**	**8,355.82**	**1,140.45**	**2,077.56**	**3,092.23**	**26.44**	**15,203.85**	**0.00**	**0.00**
TADLAPET RANGE									
Chintapalli	157.02	574.77	11.93	98.79	133.63	0.00	976.14	0.00	0.00
Dammannapet	173.66	323.14	4.35	52.48	131.27	0.00	684.90	0.00	0.00
Lingapur	147.70	444.09	12.50	106.93	165.24	0.00	876.46	0.00	0.00
Makulpet	172.93	397.52	10.75	49.62	69.72	0.00	700.54	0.00	0.00
Mallial	98.40	1,776.71	154.98	363.68	30.67	3.47	2,427.91	0.00	0.00
Mohammadabad	11.61	619.49	60.34	235.10	77.52	1.24	1,005.30	0.00	0.00
Patha Mamidipalli	115.70	345.54	6.70	46.53	57.58	0.00	572.06	0.00	0.00
Ralli	63.54	206.97	1.46	23.54	32.51	0.00	328.02	0.00	0.00
Singaraipet	85.34	786.16	73.13	104.32	12.44	0.18	1,061.57	0.00	0.00
Tadlapet	127.75	816.27	54.35	59.65	8.50	0.02	1,066.55	0.00	0.00
Tanimadugu	81.44	402.90	5.74	59.55	27.42	0.00	577.05	0.00	0.00
Total	**1,235.09**	**6,693.56**	**396.23**	**1,200.19**	**746.50**	**4.91**	**10,276.50**	**0.00**	**0.00**
UTNOOR-KTR RANGE									
Chinnakohinoor	25.04	231.39	133.87	127.02	394.77	0.12	912.22	0.00	0.00
Ghanpur	3.55	250.40	272.52	242.39	631.40	0.30	1,400.56	0.00	0.00
Hasnapur	29.92	575.64	285.98	228.12	920.22	0.16	2,040.04	0.00	0.00
Netnoor	49.25	1,879.38	1,508.27	2,093.10	4,154.42	10.38	9,694.81	0.00	0.00
Raghapur	42.48	734.79	400.48	346.84	561.63	0.24	2,086.46	0.00	0.00
Rasimetta	17.10	718.37	555.60	1,096.47	1,039.28	4.22	3,431.04	0.00	0.00
Utnoor	4.80	739.12	1,107.01	1,218.31	1,018.24	0.50	4,087.99	0.00	0.00
Total	**172.14**	**5,129.09**	**4,263.73**	**5,352.25**	**8,719.96**	**15.92**	**23,653.12**	**0.00**	**0.00**
Division Total	**3,577.96**	**53,711.02**	**17,941.00**	**22,475.97**	**26,649.97**	**98.00**	**124,454.01**	**0.00**	**0.00**

Satellite Imageries

2012



2013



Longitude	79.11699 ° E
Latitude	19.08039 ° N
Area in Ha	0.94
Change	DF to NF
Comp No.	371
Beat	Tadlapet
Range	Tadlapet
Division	**Jannaram**

4.6 KAWAL TR WEST(NIRMAL) DIVISION

4.6.1. Introduction

Kawal TR West (Nirmal) Forest Division lies in the western part of Adilabad District between latitudes 18^0 50' 36" N and 19^0 25' 27"N and longitudes 77^0 45' 42" E and 78^0 56' 40" E. Geographical area of the Division is **3786.21 Km²** which is **23.47%** of the area of the District. Godavari is the major river of the Division and forms its southern boundary. Siddha and Kadamare other important rivers, which are tributaries of River Godavari.

Land use pattern of the Division is given in Table 4.6.1.

The temperature varies from15^0C to 40^0C. The normal Annual rainfall of the Division is 800 mm received mainly from south-west monsoons.

Soils found in the Division are black, chalka and red, sandy loams, saline and alkaline. The Division has reserves of iron ore, lime stone and clays.

Population of the Division is 0.68 million (2011 Census), per capita forest area is **0.15 Ha** and the population density is 209 persons per Km².

4.6.2. Recorded Forest Area:

The total notified forest area of the Division is **1441.35 Km²**, which is **38.06%** of the total geographical area. Reserved, Protected and un-classed Forests Constitute **354.57 Km²** (24.60%), **1006.12 Km²** (69.80%) and **80.66 Km²** (5.60%) of the total forest area respectively.

As per Champion and Seth's classification the forests of Division fall under Tropical Dry Deciduous & Bamboo Mixed Forests (Dry Teak bearing Forests, Dry Mixed Forests).

Table 4.6.1: Land use pattern (for entire Geographical area)

Land use	Area in Km²	Percentage
Forest including Scrub	1175.93	31.06%
Agriculture	1955.52	51.65%
Land with Scrub	76.52	2.02%
Fallow Lands	75.74	2.00%
Grasslands	0.46	0.01%
Settlements	32.95	0.87%
Vegetation outside Forest	145.99	3.86%
Water body	323.1	8.53%
Total	**3786.21**	**100.00%**

Source: AS per LULC map prepared by NRSC, Hyderabad in 2007

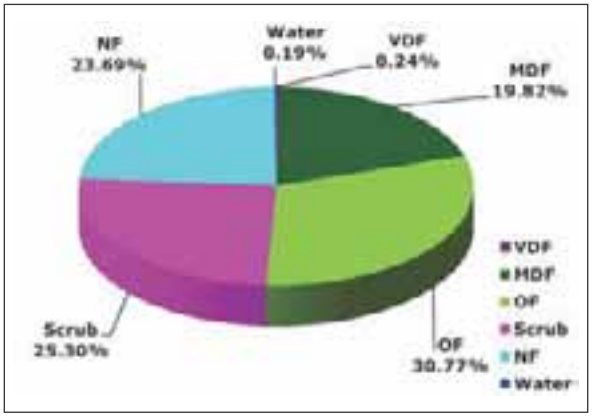
4.6.3. Protected Area:

The entire notified forests and geographical area of the division is included in the **Kawal Wildlife Sanctuary & Tiger Reserve**.

4.6.4. Community Forest Management:

There are 242 Vana Samrakshana Samities (VSSs) in the Division. An area of **309.57 Km²** forests, which is **21.47%** of the notified forests, is under the management of the VSSs.

Fig 4.6.1



4.6.5. Forest Cover:

The forest cover in the Division, based on the interpretation of IRS R2 LISS-III 2013 data (Dec 2013) and LISS-IV data (2011-2014) is **654.63 Km²** which is **17.29%** of the geographical area. In terms of the forest canopy density classes the Division has **3.03 Km²** of Very

Dense Forests, **255.31** Km^{2}of Moderately Dense Forests and **396.29 Km^2** of Open Forests. The area of the Scrub is **325.95 Km^2**, Non-Forest **305.09 Km^2** and Water Bodies **2.44 Km^2**. The distribution of the forest cover of the Division is shown in Fig 4.6.1.

4.6.6. Change in Forest Cover

The Satellite images of 2012and 2013 are shown in Fig 4.6.2 & Fig 4.6.3 respectively and the changes during this period are shown on the image of 2012.

Fig 4.6.2: LISS-III Imagery of Kawal TR West (Nirmal) Division of Oct. 2012

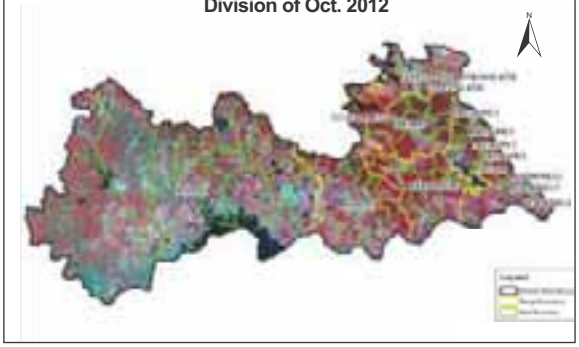
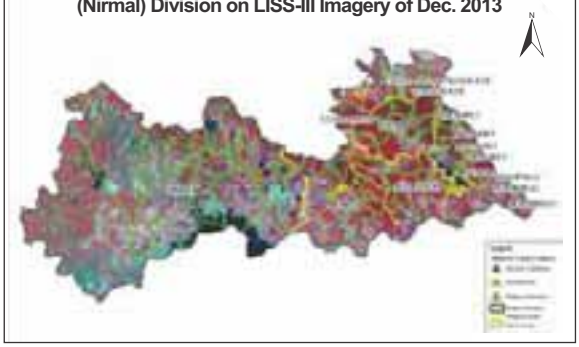


Fig 4.6.3: Vegetation Change Locations of Kawal TR West (Nirmal) Division on LISS-III Imagery of Dec. 2013



Comparison of the current forest cover with that of previous assessment year shows a no change. However, including the scrub, the negative change is1**10.87 Ha** and positive change is **30.12 Ha**. The forest cover change matrix given in Table 4.6.2 reveals the changes from one class to another class.

The entire total positive change, is on account of growth in raising plantations. Out of the total negative change including scrub **69.63 Ha** is on account of clearance of jungle growth for raising of plantations and **41.24 Ha** is on account of encroachments. As clearance of jungle growth for raising of plantations are forest management interventions the same are not considered as loss of forest cover. Thus only the negative change due to encroachments is taken as loss of forest cover. Therefore the **net loss of forest is 41.24 Ha** in the Division.

There are 56 Beats in the division. Negative changes in forest cover are noticed in10 Beats and positive in 2 Beats. There are no changes in the remaining 44 Beats.

Details of forest cover in all Beats of the Division are shown in Table 4.6.3.

Table 4.6.2. Forest Cover Change Matrix: (Area in Km^2)

2012	2013						Total of 2012
	VDF	MDF	OF	Scrub	NF	WATER	
Very Dense Forest	3.03	0.00	0.00	0.00	0.00	0.00	3.03
Moderately Dense Forest	0.00	255.31	0.00	0.00	0.06	0.00	255.37
Open Forest	0.00	0.00	396.29	0.00	0.00	0.00	396.29
Scrub	0.00	0.00	0.00	325.65	1.11	0.00	326.76
Non-Forest	0.00	0.00	0.00	0.30	303.92	0.00	304.22
Water	0.00	0.00	0.00	0.00	0.00	2.44	2.44
Total of 2013	**3.03**	**255.31**	**396.29**	**325.95**	**305.09**	**2.44**	**1288.11**
Net Change	0.00	-0.06	0.00	-0.81	0.87	0.00	0.00

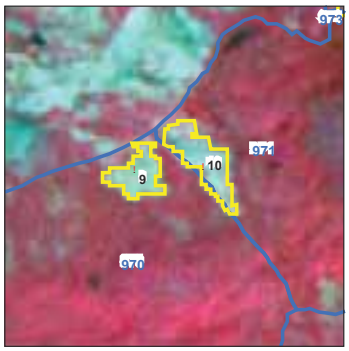
Table 4.6.3. Beat Wise Forest Cover: Area in Ha

Beat	VDF	MDF	OF	SF	NF	WB	Total	Net Change	Encr.
ECHODA-KTR RANGE									
Gairjam	1.02	169.69	341.80	195.61	318.35	0.32	1,026.80	0.00	0.00
Kuntala	0.09	38.60	134.29	198.89	127.34	0.03	499.24	0.00	0.00
Madhapur	0.65	124.49	231.67	197.49	795.01	0.51	1,349.82	0.00	0.00
Pisra	5.07	666.34	928.97	651.17	701.56	0.71	2,953.82	0.00	0.00
Pochampally(s)	0.78	231.70	720.82	967.03	1,694.07	0.09	3,614.49	0.00	0.00
Shampur	5.32	478.09	913.67	777.22	1,505.14	0.15	3,679.58	0.00	0.00
Sirchalma	3.00	441.95	795.77	495.55	1,156.05	0.49	2,892.82	0.00	0.00
Sirkonda	0.13	57.81	192.92	345.90	1,282.04	0.06	1,878.86	0.00	0.00
Talamadri	2.09	247.61	529.52	372.28	902.21	0.30	2,054.00	0.00	0.00
Waipet	0.58	122.55	401.62	828.75	1,235.63	0.12	2,589.25	0.00	0.00
Waipet[south]	0.55	419.20	823.04	1,430.82	903.31	0.34	3,577.27	0.00	0.00
Total	**19.28**	**2,998.02**	**6,014.11**	**6,460.71**	**10,620.70**	**3.13**	**26,115.94**	**0.00**	**0.00**
KADAM RANGE									
Alampally_east	6.64	831.49	736.44	542.26	317.98	0.29	2,435.11	0.00	0.00
Alampally_west	1.91	776.95	797.23	438.85	281.09	0.05	2,296.07	0.00	0.00
Dasturabad	1.95	470.36	147.74	349.06	146.93	7.12	1,123.18	0.00	0.00
Dattojipet	10.99	976.36	997.78	574.42	228.19	0.59	2,788.32	0.00	0.00
Dildarnagar	0.00	39.94	127.43	225.76	31.14	30.65	454.91	0.00	0.00
Gangapur	1.73	474.14	695.99	1,087.43	566.81	0.22	2,826.32	0.00	0.00
Lakshmipur	9.89	696.54	801.29	1,085.76	160.99	0.47	2,754.93	0.00	0.00
Munial	83.25	464.27	88.60	70.63	502.44	3.20	1,212.38	0.00	0.00
Pandavapur	10.56	594.83	841.03	830.14	371.62	4.70	2,652.90	0.00	0.00
Peddur	0.12	323.89	970.32	436.04	211.66	17.43	1,959.46	0.00	0.00
Total	**127.04**	**5,648.76**	**6,203.85**	**5,640.37**	**2,818.84**	**64.72**	**20,503.58**	**0.00**	**0.00**
KHANAPUR RANGE									
Beernandi	2.61	297.63	503.99	541.11	461.23	0.16	1,806.72	0.00	0.00
Iqbalpur	0.11	318.23	512.27	203.22	16.11	15.51	1,065.44	0.00	0.00
Khanapur	0.32	292.06	666.10	578.67	92.96	22.94	1,653.06	0.00	0.00
Mandapally	0.88	261.52	571.32	707.78	129.82	0.00	1,671.32	0.00	0.00
Maskapur	0.02	331.49	496.76	239.56	24.02	16.62	1,108.46	-23.56	0.00
Muthyampet	0.31	269.84	620.66	321.80	274.07	3.10	1,489.78	0.00	0.00
Nagapur	1.81	470.33	773.79	879.12	158.15	0.01	2,283.21	0.00	0.00
Pochampally	2.47	199.05	435.57	388.61	668.10	0.48	1,694.27	0.00	0.00
Rajura	2.60	318.42	538.54	430.23	252.44	0.58	1,542.82	0.00	0.00
Sattanpally	2.44	249.30	490.43	440.17	172.02	3.81	1,358.17	0.00	0.00
Singapur	2.79	426.11	661.35	476.85	252.94	0.28	1,820.32	0.00	0.00
Somwarpet	0.15	147.74	509.55	516.65	497.81	0.27	1,672.17	0.00	0.00
Total	**16.51**	**3,581.72**	**6,780.32**	**5,723.76**	**2,999.67**	**63.76**	**19,165.75**	**-23.56**	**0.00**
MAMDA RANGE									
Arepally	5.34	321.33	828.13	511.80	781.96	1.86	2,450.41	-22.79	22.79
Bandal Khanapur	0.09	153.74	1,042.58	652.06	213.07	14.78	2,076.32	0.00	0.00
Boregaon	10.08	378.42	525.75	380.82	492.22	0.69	1,787.97	-18.45	18.45

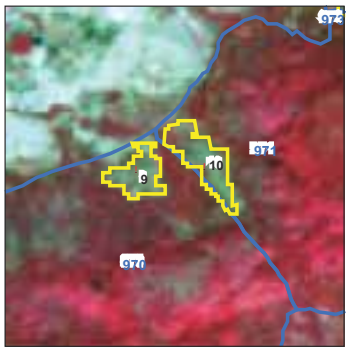
Dimmadurthy	0.08	347.55	666.47	240.45	57.17	17.19	1,328.90	0.00	0.00
Gaidpally	12.71	381.15	257.80	161.69	508.69	0.13	1,322.17	0.00	0.00
Kappanpally	2.65	423.60	721.45	445.52	119.44	9.54	1,722.20	0.00	0.00
Mamda	3.77	295.46	583.74	241.50	162.26	3.07	1,289.79	0.00	0.00
Medpally	16.18	482.43	576.65	367.41	504.58	0.84	1,948.10	-6.09	0.00
Naldurthy	0.21	720.52	1,127.24	414.58	160.25	27.84	2,450.66	0.00	0.00
Ranapur	4.18	265.01	364.40	276.20	227.30	0.50	1,137.60	0.00	0.00
Total	**55.29**	**3,769.21**	**6,694.20**	**3,692.04**	**3,226.94**	**76.45**	**17,514.13**	**-47.33**	**41.24**
NIRMAL RANGE									
Bamini	3.54	202.14	326.32	108.67	142.78	14.92	798.36	13.44	0.00
Chincholi	3.15	187.52	486.04	348.43	170.21	0.30	1,195.66	3.51	0.00
Dhani	3.16	202.92	549.60	410.98	458.03	0.65	1,625.33	-5.66	0.00
Dilawarpur	0.75	61.14	267.96	132.29	93.52	0.32	555.97	-6.79	0.00
Doderna	4.82	365.38	402.79	123.58	196.50	0.76	1,093.84	0.00	0.00
Jam	5.52	288.01	426.12	326.62	576.05	0.50	1,622.82	0.00	0.00
Jewly	4.33	558.15	347.06	242.93	1,104.97	4.14	2,261.58	0.00	0.00
Koutla	4.35	348.09	491.84	382.14	620.86	4.10	1,851.38	0.00	0.00
Kubeer	13.96	761.56	633.04	235.20	808.10	0.91	2,452.77	0.00	0.00
Kuntala	2.29	693.29	521.22	322.95	517.05	0.20	2,056.99	0.00	0.00
Mogli	14.68	164.65	363.59	319.06	221.99	0.34	1,084.32	0.00	0.00
Narsapur	1.18	322.29	420.00	141.08	106.86	0.78	992.19	0.00	0.00
Neelaipet	2.39	144.89	388.64	288.47	377.47	0.41	1,202.27	-7.68	0.00
Ola	0.94	608.48	609.07	406.72	775.34	0.31	2,400.85	0.00	0.00
Pyaramoor	1.37	165.60	221.28	284.31	236.03	1.43	910.02	-6.68	0.00
Total	**66.42**	**5,074.09**	**6,454.57**	**4,073.43**	**6,405.74**	**30.07**	**22,104.33**	**-9.86**	**0.00**
PEMBI RANGE									
Domdhari	1.16	850.89	1,274.66	1,093.38	384.19	0.79	3,605.07	0.00	0.00
Englapur	1.92	741.55	678.92	364.93	305.22	0.06	2,092.60	0.00	0.00
Itkial	0.44	265.01	652.90	1,009.97	672.44	0.82	2,601.59	0.00	0.00
Paspula	5.35	723.02	1,254.27	693.57	713.40	1.31	3,390.92	0.00	0.00
Pembi	2.53	490.84	1,274.91	1,466.65	569.69	0.31	3,804.92	0.00	0.00
R.d.nala	0.28	256.49	645.66	929.92	163.13	0.04	1,995.51	0.00	0.00
Raidhari	3.93	331.80	587.64	445.06	910.94	0.76	2,280.12	0.00	0.00
Tatiguda	0.67	343.98	692.12	533.21	376.35	1.74	1,948.06	0.00	0.00
Yapaguda	2.21	455.66	420.86	468.01	341.75	0.04	1,688.52	0.00	0.00
Total	**18.47**	**4,459.22**	**7,481.93**	**7,004.70**	**4,437.11**	**5.87**	**23,407.30**	**0.00**	**0.00**
Division Total	**303.00**	**25,531.03**	**39,628.98**	**32,595.01**	**30,509.01**	**244.00**	**128,811.02**	**-80.75**	**41.24**

Satellite Imageries

2012



2013



Longitude	78.34746 ° E
Latitude	19.13736 ° N
Area in Ha	5.4
Change	NF to SF
Comp No.	970
Beat	Chincholi
Range	Nirmal
Division	**Nirmal**

4.7 ACHAMPET WLM DIVISION

4.7.1. Introduction

Achampet WLM Forest Division lies in the south eastern part of MahaboobNagar District between latitudes16^0 08' 50" N & 16^0 37' 45" N and longitudes 78^0 4' 30" E & 78^0 58' 50" E. The Geographical Area of the Division is **4405.88 Km^2**, which is **23.85%** of the geographical area of the District. The Division has two physiographic zones, the Amrabad plateau of Nallamalai hills having an altitude of 500 to 876 m and the plains having an altitude of 200 to 500 m. The River Krishna forms Southern boundary of the Division as well as the District. Major tributaries of Krishna falling in Division are Dindi, Bhumunikolanu vagu, Nallavagu, Buggavagu and Yemulapayavagu.

Land use pattern of the Division as in Achampet division is given in Table 4.7.1.

The climate of this Division is generally dry with temperatures ranging from 15^{0}C to 40^{0}C. The annual rainfall is about 700 mm received mainly from Southwest monsoons. Srisailam quartzite occupies most part of the Division. The soil types found mainly are Black cotton, Red and Brown sandy loam.

The total population of the Division is 0.49 million (2011 Census) which constitutes 12.25% of the total population of the District. The per capita forest area is **0.49 Ha**. The population density is 10persons per Km^2. The livestock population is 4.82 million.

4.7.2. Recorded Forest Area:

The notified forest area of the Division is **2423.36 Km^2**, which is **55.00%** of the geographical area. Extents of Reserved-, Protected- and Un-classed forests are**1881.51 Km^2** (77.64%), **376.72 Km^2** (15.55%) and **165.03 Km^2** (6.81%) respectively of the total forest area.

As per Champion and Seth's classification the Forests of Division fall under Tropical dry deciduous, Tropical Moist deciduous, Tropical Semi-evergreenand Tropical Thorn Forest types.

Table 4.7.1: Land use pattern (for entire Geographical area)

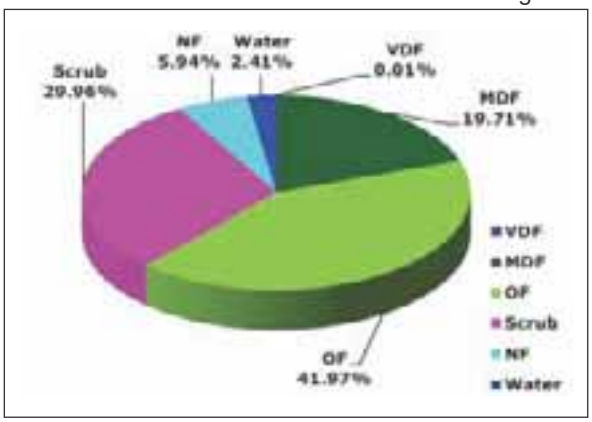
Land use	Area in Km^2	Percentage
Forest including Scrub	2993.29	52.05%
Agriculture	804.03	18.25%
Land with Scrub	286.07	6.49%
Fallow Lands	155.27	3.52%
Grasslands	127.72	2.90%
Settlements	4.03	0.09%
Not available for cultivation	645.24	14.64%
Water bodies	90.23	2.09%
Total	**4405.88**	**100.00%**

Source: AS per LULC map prepared by NRSC, Hyderabad in 2007

4.7.3. Protected Area:

The Division is one of the 4 constituent Divisions of erstwhile **NagarjunaSagar–Srisailam Tiger Reserve (NSTR)** and now named as **Amrabad Tiger Reserve.** Out of **2,423.36 Km^2** of forest area an area of **1750 Km^2** is included in the ATR.

Fig 4.7.1



4.7.4. Community Forest Management:

There are 79 Vana Samrakshana Samities (VSSs) or JFPCs in the Division. **216.73 Km^2** or **8.95%** of forest area of the Division is under management of the VSSs.

4.7.5. Forest Cover:

The forest cover in the Division based on the

interpretation of IRS R2 LISS-III 2013 data (Feb 2014)and LISS-IV data (2011-2014) is **1494.93 Km²** which is **33.93%** of the Geographical area. In terms of the forest canopy density classes the Division has **0.15 Km²** of Very Dense Forests, **477.75 Km²** of Moderately Dense Forests and **1017.03 Km²** of Open Forests. The area of the Scrub is **726.00 Km²** that of Non-Forest **144.00 Km²** and Water Bodies **58.44 Km²**. The distribution of the forest cover of the Division is shown in Fig 4.7.1.

4.7.6. Change in Forest Cover

The Satellite images of 2012 and 2013 are shown in Figures 4.7.2 & 4.7.3 respectively and the changes during this period are shown on the image of 2013.

Fig 4.7.2: LISS-III Imagery of Achampet WLM Division of Oct. 2012



Fig 4.7.3: Vegetation Change Locations of Achampet WLM Division on LISS-III Imagery of Dec. 2013



Comparison of the current forest cover with that of previous assessment year shows a negative change of **1.16 Ha**. However, including the scrub, the total positive change comes to **16.50 Ha** and negative change comes to **25.27 Ha**. The forest cover change matrix given in Table 4.7.2 reveals the changes from one class to another class.

The entire total Positive change is on account of growth in plantations raised. Out of the total negative change including scrub, **11.54 Ha** is on account of carrying advance operations for raising of plantation, **9.17 Ha** is on account of harvesting of plantations and **4.56 Ha** is on account of encroachments. As advance operations and harvesting of plantations etc. are forest management interventions; the same are not considered as loss of forest cover. Hence the negative change on account of encroachments alone is taken as loss of forest cover. Therefore, the **net loss of forest in the Division 4.56 Ha** only.

There are 70 Beats in the Division. Negative changes in forest cover are seen in 5 Beats and positive in 1 Beat only. There is no change in the remaining 64 Beats.

Details of forest cover in all Beats of the Division are shown in Table 4.7.3.

Table 4.7.2. Forest Cover Change Matrix: (Area in Km²)

2012	2013						Total of 2012
	VDF	MDF	OF	Scrub	NF	WATER	
Very Dense Forest	0.15	0.00	0.00	0.00	0.00	0.00	0.15
Moderately Dense Forest	0.00	477.75	0.00	0.00	0.00	0.00	477.75
Open Forest	0.00	0.00	1017.03	0.00	0.01	0.00	1017.04
Scrub	0.00	0.00	0.00	725.83	0.24	0.00	726.07
Non-Forest	0.00	0.00	0.00	0.17	143.75	0.00	143.92
Water	0.00	0.00	0.00	0.00	0.00	58.44	58.44
Total of 2013	**0.15**	**477.75**	**1017.03**	**726.00**	**144.00**	**58.44**	**2423.37**
Net Change	0.00	0.00	-0.01	-0.07	0.08	0.00	0.00



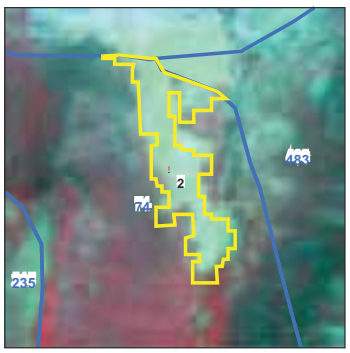
Table 4.7.3. Beat Wise Forest Cover: Area in Ha

Beat	VDF	MDF	OF	SF	NF	WB	Total	Net Change	Encr.
ACHAMPET RANGE									
Achampet	0.00	499.60	895.67	150.10	1.65	0.00	1,547.02	0.00	0.00
Banala(n)	0.00	865.05	731.93	36.91	0.00	0.00	1,633.89	0.00	0.00
Banala(s)	0.00	1,567.80	499.52	32.79	3.34	61.50	2,164.95	0.00	0.00
Billakal	0.00	581.65	463.16	50.59	0.00	0.31	1,095.71	0.00	0.00
Bommanapally	0.00	506.45	1,372.04	195.50	27.09	0.00	2,101.08	0.00	0.00
Choutapally	0.00	1,296.40	535.13	29.06	0.00	0.00	1,860.59	0.00	0.00
Ganapur	0.00	14.59	1,308.57	1,535.43	86.24	1.81	2,946.64	0.00	0.00
Inole	0.00	11.72	236.82	1,017.77	86.98	2.76	1,356.05	0.00	0.00
Kondanagul	0.00	431.18	991.91	127.35	10.42	0.00	1,560.86	0.00	0.00
Mannevari Pally	0.07	15.24	1,346.35	2,023.64	191.02	5.53	3,581.85	0.00	0.00
Rangapur	0.00	1,171.51	911.04	140.95	4.65	0.00	2,228.15	0.00	0.00
Siddapur-(e)	0.66	231.38	1,207.74	1,089.93	144.36	4.18	2,678.25	15.34	1.16
Siddapur-(w)	0.00	8.63	533.82	1,140.91	36.57	3.98	1,723.91	0.00	0.00
Total	**0.73**	**7,201.20**	**11,033.70**	**7,570.93**	**592.31**	**80.07**	**26,478.94**	**15.34**	**1.16**
AMRABAD RANGE									
Amrabad	0.00	722.51	3,015.35	2,561.78	524.36	0.61	6,824.61	0.00	0.00
Domarlagundi	2.82	8.84	1,034.52	4,726.14	794.89	722.66	7,289.87	0.00	0.00
Ippalapally	0.00	1.00	657.51	1,255.41	115.78	217.85	2,247.55	0.00	0.00
Kollampenta	0.00	1,679.58	1,407.28	454.43	59.81	0.00	3,601.10	0.00	0.00
Macharam-(n)	0.00	251.01	1,181.02	1,147.07	177.65	3.25	2,760.00	-6.56	0.00
Macharam-(s)	0.00	666.87	2,350.21	1,496.34	323.69	0.60	4,837.71	0.00	0.00
Maddimadugu	0.51	38.78	1,492.52	10,066.38	3,097.97	158.03	14,854.19	0.00	0.00
Maredugu	0.00	68.26	5,295.86	9,252.43	1,273.20	206.46	16,096.21	0.00	0.00
New Road Farhabad	0.00	2,422.98	1,707.08	387.61	24.54	0.00	4,542.21	0.00	0.00
Padara	0.00	182.56	2,717.71	4,127.80	1,275.91	0.19	8,304.17	0.00	0.00
Tirmalapur	0.00	522.78	6,107.22	4,433.23	374.01	0.47	11,437.71	0.00	0.00
Ummanpenta	2.08	0.00	524.63	4,443.21	1,033.82	284.61	6,288.35	0.00	0.00
Vatvarlapally(e)	0.40	1,647.60	7,465.42	1,840.81	656.88	79.00	11,690.11	0.00	0.00
Vatvarlapally(n)	0.00	277.71	1,814.49	367.04	0.00	0.00	2,459.24	0.00	0.00
Total	**5.81**	**8,490.48**	**36,770.82**	**46,559.68**	**9,732.49**	**1,673.73**	**103,233.01**	**-6.56**	**0.00**
KOLLAPUR RANGE									
Amaragiri	0.00	5.49	390.83	1,011.62	222.02	211.17	1,841.13	0.00	0.00
Ankilpenta(n)	0.00	1,885.67	212.36	10.50	0.00	0.00	2,108.53	0.00	0.00
Ankilpenta(s)	0.00	1,284.32	448.86	25.09	0.00	0.00	1,758.27	0.00	0.00
Bollaram	0.28	644.10	1,573.61	746.97	196.94	460.24	3,622.14	0.00	0.00
Chintapally_s-ii	0.00	84.41	614.02	587.18	29.15	0.00	1,314.76	0.00	0.00
Chintapally-s-i	0.00	74.22	511.55	507.49	104.42	83.29	1,280.97	0.00	0.00
Kollapur	0.00	66.70	543.50	405.93	102.38	39.36	1,157.87	0.00	0.00
Medarvote	0.00	131.45	618.35	732.31	246.08	13.10	1,741.29	0.00	0.00
Narlapur	0.74	7.12	237.72	1,351.94	1,106.54	19.71	2,723.77	0.00	0.00
Peddavote	0.00	1,090.10	1,336.95	251.39	4.53	0.83	2,683.80	0.00	0.00
Somasila	0.78	52.91	724.31	754.07	297.78	33.21	1,863.06	0.00	0.00
Sukkalagundam	0.00	906.61	775.44	103.24	2.15	140.15	1,927.59	0.00	0.00
Yeddulagundam	0.00	1,641.64	790.67	53.85	0.00	0.00	2,486.16	0.00	0.00

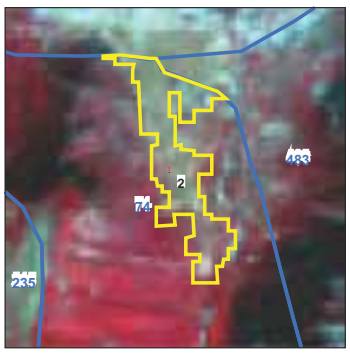
Yellore	0.00	1.27	49.21	571.44	98.44	258.16	978.52	-3.40	3.40
Yerragundam Penta	0.00	1,047.91	1,493.15	266.62	4.12	187.72	2,999.52	0.00	0.00
Yerrapenta	0.00	2,328.21	2,844.89	355.48	4.34	288.74	5,821.66	0.00	0.00
Yetham	0.00	0.03	20.86	385.91	315.75	2.60	725.15	0.00	0.00
Total	**1.80**	**11,252.16**	**13,186.28**	**8,121.03**	**2,734.62**	**1,738.28**	**37,034.17**	**-3.40**	**3.40**
LINGAL RANGE									
Appaipally	0.00	428.89	616.01	120.08	0.00	0.00	1,164.98	0.00	0.00
Bacharam	0.00	0.00	136.11	992.40	78.59	5.19	1,212.29	-11.54	0.00
Balmoor	0.00	229.21	468.21	43.56	16.53	0.00	757.51	0.00	0.00
Dhararam	0.00	391.45	557.05	45.89	5.37	0.00	999.76	0.00	0.00
Gorremadug S-i	0.00	20.81	580.48	367.17	0.36	0.00	968.82	0.00	0.00
Gorremadug S-ii	0.00	228.57	558.31	86.61	0.00	0.00	873.49	0.00	0.00
Lingal	0.43	127.79	924.95	472.69	376.79	32.53	1,935.18	0.00	0.00
Mareddinne	0.00	1.06	142.34	208.27	18.38	14.17	384.22	-2.61	0.00
Marlapaya	0.00	1,323.03	796.07	46.89	4.01	2.34	2,172.34	0.00	0.00
Padmanapally	0.00	755.69	587.05	41.70	19.21	6.74	1,410.39	0.00	0.00
Rayawaram	0.00	17.43	514.63	182.13	380.02	0.00	1,094.21	0.00	0.00
Sathapur	1.09	2.20	297.26	1,298.07	271.91	53.39	1,923.92	0.00	0.00
Total	**1.52**	**3,526.13**	**6,178.47**	**3,905.46**	**1,171.18**	**114.36**	**14,897.12**	**-14.15**	**0.00**
MANNANUR RANGE									
Appapur	0.00	717.04	1,016.69	39.19	0.00	25.09	1,798.01	0.00	0.00
Behirapur-(n)	0.00	1,986.99	3,929.65	244.23	6.30	403.71	6,570.88	0.00	0.00
Behirapur-(s)	0.00	193.07	1,264.14	408.43	5.81	255.79	2,127.24	0.00	0.00
Burujugundal	0.00	1,758.78	1,388.61	242.05	0.00	0.00	3,389.44	0.00	0.00
Eagalapenta	2.61	279.63	2,451.78	690.90	61.55	427.55	3,914.02	0.00	0.00
Farahabad(e)	0.00	1,285.87	2,530.95	664.90	50.47	0.00	4,532.19	0.00	0.00
Farahabad(w)	0.00	771.21	1,090.44	328.38	0.00	0.00	2,190.03	0.00	0.00
Farhabad(s)	0.00	1,152.15	2,716.91	266.96	0.00	3.50	4,139.52	0.00	0.00
Mannanur-(n)	0.00	811.69	819.54	421.01	4.55	0.00	2,056.79	0.00	0.00
Mannanur-(s)	0.00	2,467.19	1,853.15	173.26	0.00	3.10	4,496.70	0.00	0.00
Pullaipally	0.00	2,269.60	3,104.31	262.79	0.00	0.00	5,636.70	0.00	0.00
Rampur	0.00	1,512.72	1,782.88	322.27	1.38	4.64	3,623.89	0.00	0.00
Sangadigundal	2.51	1,642.02	8,771.85	2,076.01	24.06	970.83	13,487.28	0.00	0.00
Vatvarlapally(s)	0.00	457.43	1,813.08	278.01	38.65	143.90	2,731.07	0.00	0.00
Total	**5.12**	**17,305.39**	**34,533.98**	**6,418.39**	**192.78**	**2,238.11**	**60,693.77**	**0.00**	**0.00**
Division Total	**14.98**	**47,775.36**	**101,703.25**	**72,575.49**	**14,423.38**	**5,844.55**	**242,337.01**	**-8.77**	**4.56**

Satellite Imageries

2012



2013



Longitude	78.89647° E
Latitude	16.49880° N
Area in Ha	16.5
Change	NF TO SF
Comp No.	74
Beat	Siddapur(E)
Range	Achampet
Division	**Achampet WLM**

4.8 NAGARJUNA SAGAR WLM DIVISION

4.8.1. Introduction

Nagarjuna Sagar WLM Forest Division is situated in Nalgonda district. It is located between latitudes16^{0}21' 18" N & 16^{0}55' 04" N and longitudes 78^{0}51' 18" E & 79^{0}27' 57" E. Geographical area of the Division is **1685.72 Km^2**, which is **11.84%** of the geographical area of the District. The Division has an average altitude of 615 m above MSL. The River Krishna is Main River of the Division.

Land use pattern of the Division as in Nagarjuna Sagar Division is given in Table 4.8.1.

The climate of this Division is extreme hot and arid. It experiences very hot summers with temperatures soaring up to high as 40^{0}C especially during March or May and June. The winters are comparatively pleasant and cool. The winter temperatures fall down to 10^{0}C. The Nagarjuna Sagar Wildlife Sanctuary experiences heavy rainfall caused by the south west monsoons from the month of June to October.

This Division contains very rich minerals like Limestone, Quartzite, Granite, Feldspar etc. The soil types found mainly are black cotton, red and brown sandy loam.

Population of the Division is 0.40 million (2011 Census) which constitutes 11.49% of the total populations of the District. The per capita forest area is **0.097 Ha** and the population density is 240 persons per Km^2.

4.8.2. Recorded Forest Area:

The notified forest area of the Division is **386.64 Km^2** which is **22.94%** of the geographical area. As per Champion and Seth's classification the forests of the Division fall under Tropical Dry Deciduous and Tropical Thorn Forest types.

Table 4.8.1: Land use pattern (for entire Geographical area)

Land use	Area in Km^2	Percentage
Forests Including Scrub	555.52	32.96%
Agriculture	795.53	47.19%
Fallow Lands	27.7	1.64%
Grass Lands	14.29	0.85%
Settlements	5.92	0.35%
Vegetation outside Forest	80.88	4.80%
Water bodies	205.83	12.21%
Total	**1685.67**	**100.00%**

Source: AS per LULC map prepared by NRSC, Hyderabad in 2007

4.8.3. Protected Area:

Nagarjuna Sagar WL Division is one of the 4constituent Divisions of erstwhile **Nagarjuna Sagar–Srisailam Tiger Reserve (NSTR)**, now named as **Amrabad Tiger Reserve**. An area of **386.64 Km^2** is included in the Tiger Reserve.

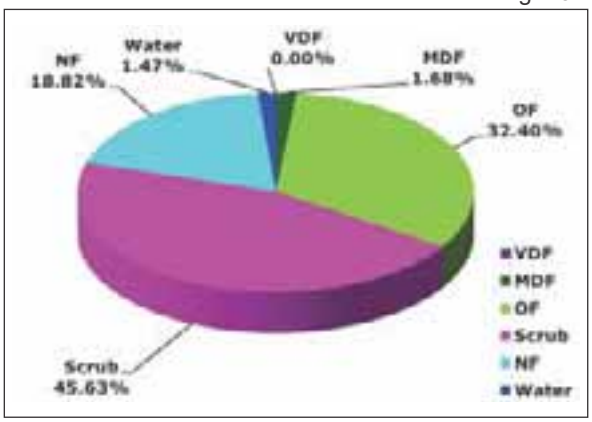
4.8.4. Community Forest Management:

There are 79 Vana Samrakshana Samities (VSSs) in the Division. An area of **176.23 Km^2** forests which is **21.19%** of the notified forests is under the management of the VSSs.

4.8.5. Forest Cover:

The forest cover in the Division based on the interpretation of IRS R2 LISS-III 2013 data (Feb 2014) is **152.38 Km^2** which is **9.04%** of the geographical area. In terms of the forest canopy density classes the Division has

Fig 4.8.1



7.50 Km² of Moderately Dense Forest and **144.88 Km²** of Open Forest. The area of the Scrub is **204.04 Km²**, Non-Forest **84.14 Km²** and Water Bodies **6.59 Km²**.The distribution of the forest cover of the Division is shown in Fig 4.8.1.

4.8.6. Change in Forest Cover

The Satellite images of 2012 and 2013 are shown in Fig (4.8.2 & 4.8.3) and the changes between this period are shown on the image of 2013.

Fig 4.8.2: LISS-III Imagery of Nagarjunasagar Division of Nov. 2012



Fig 4.8.3: Vegetation Change Locations of Nagarjunasagar Division on LISS-III Imagery of Feb. 2014



Comparison of the current forest cover with that of previous assessment year shows a negative change of **8.08 Ha**. However including the scrub, the total positive change comes to **6.44 Ha** and the total negative change comes to **22.70 Ha**. The forest cover change matrix is given in Table 4.8.2 reveals the changes from one class to another class.

Out of the total positive change, **2.07 Ha** is on account of evacuation of encroached land and consequent improvement in the greenness and **4.37 Ha** is improvement of forest due to protection and management interventions. The entire total negative change, is on account of encroachments alone is taken as loss of forest cover. Therefore the **net loss of forest in the Division is 22.70 Ha** only.

There are 12 Beats in the Division. Negative changes in forest cover are noticed in 10 Beats and positive change in 2 Beats only.

Details of forest cover in all Beats of the Division are shown in Table 4.8.3.

Table 4.8.2. Forest Cover Change Matrix: (Area in Km²)

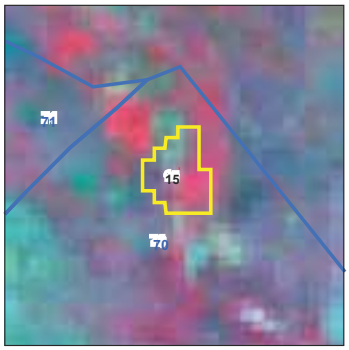
2012	2013						Total of 2012
	VDF	MDF	OF	Scrub	NF	WATER	
Very Dense Forest	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Moderately Dense Forest	0.00	7.50	0.00	0.00	0.00	0.00	7.50
Open Forest	0.00	0.00	144.88	0.02	0.06	0.00	144.96
Scrub	0.00	0.00	0.00	203.96	0.15	0.00	204.11
Non-Forest	0.00	0.00	0.00	0.06	83.93	0.00	83.99
Water	0.00	0.00	0.00	0.00	0.00	6.59	6.59
Total of 2013	**0.00**	**7.50**	**144.88**	**204.04**	**84.14**	**6.59**	**447.15**
Net Change	0.00	0.00	-0.08	-0.07	0.15	0.00	0.00

Table 4.8.3. Beat Wise Forest Cover: Area in Ha

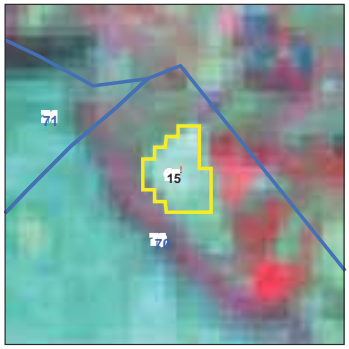
Beat	VDF	MDF	OF	SF	NF	WB	Total	Net Change	Encr.
DEVARAKONDA RANGE									
Bollaram	0.00	59.68	1,874.47	2,431.18	1,467.67	20.43	5,853.43	-3.76	8.13
Chitriyala	0.00	229.59	1,290.70	1,247.05	1,126.38	3.98	3,897.70	0.00	0.00
Kamballapaalli	0.00	355.60	2,867.56	1,739.95	628.85	63.72	5,655.67	-0.96	0.96
Kothapally	0.00	21.66	1,344.90	2,494.59	566.84	0.59	4,428.58	-3.64	3.64
Pogilla	0.00	14.63	766.92	2,507.73	603.24	152.30	4,044.82	0.00	0.00
Rekularam	0.00	26.15	2,412.88	2,237.08	453.47	122.96	5,252.53	-2.92	2.92
Total	**0.00**	**707.30**	**10,557.43**	**12,657.58**	**4,846.44**	**363.98**	**29,132.74**	**-11.28**	**15.65**
NAGARJUNASAGAR RANGE									
Nagarjunasagar	0.00	7.66	649.29	1,707.85	1,101.50	36.52	3,502.81	-2.05	2.05
Nellikal	0.00	25.57	1,425.34	863.70	133.20	135.10	2,582.90	-2.52	2.52
Pedagattu	0.00	6.61	697.29	2,126.68	999.80	103.08	3,933.45	0.72	1.35
Tunkinuthala	0.00	2.78	372.70	1,285.62	798.12	5.70	2,464.92	0.00	0.00
Waddipatla	0.00	0.00	288.03	1,170.30	280.35	14.05	1,752.72	-3.71	3.71
Yellapur	0.00	0.62	497.96	593.55	254.83	0.70	1,347.65	2.79	0.00
Total	**0.00**	**43.24**	**3,930.60**	**7,747.69**	**3,567.79**	**295.15**	**15,584.46**	**-4.77**	**9.63**
Division Total	**0.00**	**750.54**	**14,488.03**	**20,405.27**	**8,414.23**	**659.13**	**44,717.20**	**-16.05**	**25.28**

Satellite Imageries

2012



2013



Longitude	79.33168° E
Latitude	16.61833° N
Area in Ha	2.05
Change	OF TO NF
Comp No.	70
Beat	Nagarjuna Sagar
Range	Nagarjuna Sagar
Division	**Nagarjuna Sagar**



4.9 HYDERABAD DIVISION

4.9.1. Introduction:

Hyderabad Forest Division consists of Hyderabad & Rangareddy Districts. Hyderabad Forest Division lies between latitudes 16° 50' 39" N & 17° 42' 28" N and Longitudes 77° 21' 49" E & 78° 49' 49" E. The Geographical Area of the Division is **7718.52 Km²**. The average altitude is 536 m above MSL. Twin cities of Hyderabad and Secunderabad fall in this Division which is the capital of the state. The highest point in the city is Banjara Hills, which is 665 m above MSL. The contour level falls gradually from west to east creating almost a trough near the Musi River which runs through the city.

Land use pattern of the Division as in Hyderabad division is given in Table 4.9.1.

The climate of this Division is generally dry with temperatures ranging from 14°C to 45°C and the normal rain fall of the District is 786.8 mm, received mainly from Southwest monsoons.

Granites are found in the Division. The soil types mainly are Black cotton, Red and Brown sandy loam.

The population of the Division is 9.30 millions (2011 Census) .The per capita forest area is **0.01 Ha** and the population density is 1207 persons per Km². The livestock population is 1.6 million.

4.9.2. Recorded Forest Area:

The notified forest area of the Division is **730.75 Km²** which is **9.48%** of the geographical area. Reserved, Protected and Un-classed Forests Constitute **379.96 Km²** (52%), **244.70 Km²** (33.49%) and **106.09 Km²** (14.52%) of the forest area respectively.

As per Champion and Seth's classification the forests of Division fall under Tropical Dry Deciduous and Tropical Thorn Forest types.

Table 4.9.1: Land use pattern (for entire Geographical area)

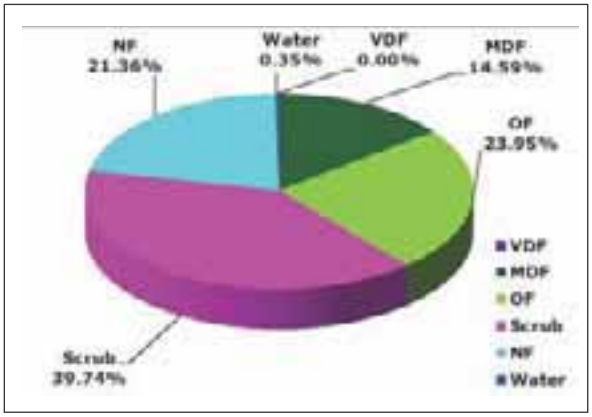
Land use	Area in Km²	Percentage
Forest including Scrub	730.75	9.47%
Agriculture	5916.47	76.65%
Land with Scrub	444.08	5.75%
Fallow Lands	14.15	0.18%
Grass Lands	0.79	0.01%
Settlements	424.91	5.51%
Not available for cultivation	27.36	0.35%
Water Bodies	160.01	2.07%
Total	**7718.52**	**100.00%**

Source: As per LULC map prepared by NRSC, Hyderabad in 2007

4.9.3. Protected Area:

There are 3 Protected Areas in the Division. These are **Chilkur National Park (4.87 Km²), KBR National Park (1.70 Km²) and of Mahaveer Harina Vanasthali Deer Park (14.12 Km²).**

Fig 4.9.1



4.9.4. Community Forest Management:

There are 123 Vana Samrakshana Samities (VSSs) in the Division. An area of **353.49 Km²** forests, which is **48.37%** of the notified forests, is under the management of the VSSs.

4.9.5. Forest Cover:

The forest cover in the Division based on the Interpretation of IRS R2 LISS-III 2013 data (Dec 2013) and LISS-IV data (2011-2014) is **292.49 Km²** which is

3.79% of the Geographical area. In terms of the forest canopy density classes the Division has **110.70 Km²** of Moderately Dense Forest and **181.79 Km²** of Open Forest. The area of the Scrub is **301.59 Km²**, Non-Forest **162.13 Km²** and Water Bodies **2.67 Km²**. The distribution of the forest cover of the Division is shown in Fig 4.9.1.

4.9.6. Change in Forest Cover

The Satellite images of 2012 and 2013 are shown in Figs 4.9.2 & 4.9.3 respectively and the changes between this period are shown on the image of 2012.

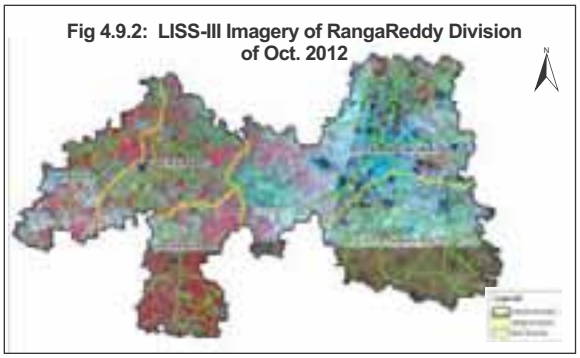


Fig 4.9.2: LISS-III Imagery of RangaReddy Division of Oct. 2012

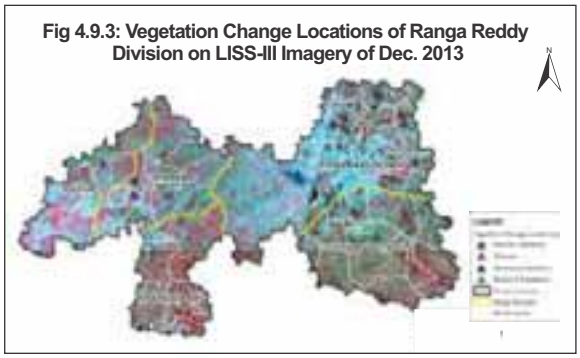


Fig 4.9.3: Vegetation Change Locations of Ranga Reddy Division on LISS-III Imagery of Dec. 2013

Comparison of the current forest cover with that of previous assessment year shows a positive change of **17.10 Ha** and is a negative change of **1.60 Ha**. However, including the scrub, the positive change comes to **230.05 Ha** and the negative change **84.30 Ha**. The forest cover change matrix given in Table 4.9.2 reveals the changes from one class to another class.

Out of the total positive including scrub of, **214.22 Ha** is on account of growth in plantations raised, **15.83 Ha** is improvement of forest due to protection and management interventions. Out of the total negative change including scrub of **74.88 Ha** is on account of carrying advance operations for raising of plantation and **9.42 Ha** is on account of encroachments. As advance operations are forest management interventions; the same are not considered as loss of forest cover. Hence the negative change on account of encroachments alone is taken as loss of forest cover. Therefore the **net loss of forest in the Division 9.42 Ha** only.

There are 62 Beats in the Division. Negative changes in forest cover are noticed in 9 Beats and positive changes noticed in 9 Beats only. There are no changes in the remaining 44 Beats.

Details of forest cover in all Beats of the Division are shown in Table 4.9.3.

Table 4.9.2. Forest Cover Change Matrix: (Area in Km²)

2012	2013						Total of 2012
	VDF	MDF	OF	Scrub	NF	WATER	
Very Dense Forest	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Moderately Dense Forest	0.00	110.70	0.00	0.00	0.00	0.00	110.70
Open Forest	0.00	0.00	181.62	0.00	0.02	0.00	181.64
Scrub	0.00	0.00	0.00	299.46	0.83	0.00	300.29
Non-Forest	0.00	0.00	0.17	2.13	161.28	0.00	163.58
Water	0.00	0.00	0.00	0.00	0.00	2.67	2.67
Total of 2013	**0.00**	**110.70**	**181.79**	**301.59**	**162.13**	**2.67**	**758.87**
Net Change	0.00	0.00	0.15	1.30	-1.45	0.00	0.00

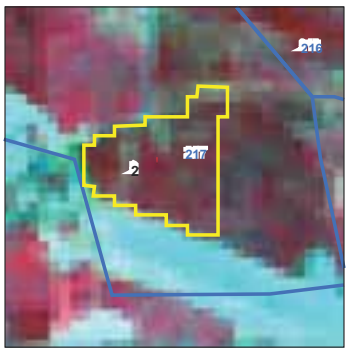
Table 4.9.3. Beat Wise Forest Cover: Area in Ha

Beat	VDF	MDF	OF	SF	NF	WB	Total	Net Change	Encr.
HYDERABAD_NORTH RANGE									
Amberpet	0.00	15.60	73.46	1,666.81	435.25	0.00	2,191.12	0.00	0.00
Ganganpahad	0.00	0.00	0.25	296.34	207.82	0.00	504.41	0.00	0.00
Keesra	0.00	46.76	155.95	1,114.69	645.13	34.99	1,997.52	0.00	0.00
Laxmapur	0.00	115.24	143.63	177.27	254.63	1.55	692.32	0.00	0.00
Medchal	0.00	0.60	26.53	518.72	280.40	0.00	826.25	29.06	0.00
Medpally	0.00	0.54	28.19	704.31	168.88	0.00	901.92	-7.82	7.82
Mudmiyal	0.00	9.49	111.78	1,157.71	153.13	0.00	1,432.11	0.00	0.00
Pochampally	0.00	20.36	332.68	606.61	84.08	0.00	1,043.73	0.00	0.00
Shamirpet	0.00	4.52	145.18	645.48	56.07	0.00	851.25	0.00	0.00
Suraram	0.00	0.00	22.23	473.44	117.40	0.00	613.07	0.00	0.00
Turkapally	0.00	312.96	493.30	791.92	286.66	0.00	1,884.84	15.83	0.00
Total	**0.00**	**526.07**	**1,533.18**	**8,153.30**	**2,689.45**	**36.54**	**12,938.54**	**37.07**	**7.82**
HYDERABAD_SOUTH RANGE									
Dardumailaram	0.00	33.38	237.18	1,222.16	332.01	0.00	1,824.73	0.00	0.00
Gollur	0.00	21.92	113.84	552.81	23.41	0.00	711.98	17.10	0.00
Gungal	0.00	53.66	447.49	769.28	39.68	0.00	1,310.11	10.61	0.00
Ibrahimpatnam	0.00	0.66	9.87	768.69	226.70	0.00	1,005.92	-0.70	0.00
Kongrakalan	0.00	30.37	171.76	1,311.22	93.17	0.00	1,606.52	15.17	0.00
Lemoor	0.00	0.01	75.87	919.88	84.63	0.00	1,080.39	0.00	0.00
Mankhal	0.00	0.50	46.17	481.57	125.57	0.00	653.81	-20.08	0.00
Nalavelly	0.00	20.79	73.27	670.65	39.63	0.00	804.34	0.00	0.00
Pahadishareef	0.00	89.47	139.51	1,312.43	344.28	14.53	1,900.22	0.00	0.00
Phulmamidi	0.00	78.96	454.01	637.20	120.19	0.00	1,290.36	0.00	0.00
Rachnoor	0.00	15.27	291.71	812.01	147.27	0.00	1,266.26	45.70	0.00
Rangapur	0.00	35.64	314.91	626.98	233.79	0.00	1,211.32	0.00	0.00
Tatparthy	0.00	192.47	850.50	474.72	104.12	3.52	1,625.33	0.00	0.00
Yacharam	0.00	56.38	460.76	608.46	83.00	0.00	1,208.60	0.00	0.00
Total	**0.00**	**629.48**	**3,686.85**	**11,168.06**	**1,997.45**	**18.05**	**17,499.89**	**67.80**	**0.00**
MOHMMADABAD RANGE									
Ananthasagar	0.00	413.19	400.40	112.42	439.36	0.00	1,365.37	0.00	0.00
Gadisingapur	0.00	146.44	955.67	276.84	185.03	2.28	1,566.26	39.73	0.00
Gadriyal	0.00	421.51	527.48	88.47	127.63	2.37	1,167.46	0.00	0.00
Ibrahimpur	0.00	42.69	596.35	406.62	290.34	0.00	1,336.00	0.00	0.00
Kalman Kalva	0.00	643.24	287.27	71.72	40.34	0.00	1,042.57	0.00	0.00
Komreddypally	0.00	42.61	396.17	941.12	441.35	0.00	1,821.25	-10.93	0.00
Kothapally	0.00	813.82	245.70	43.91	35.37	0.00	1,138.80	0.00	0.00
Kulkacherla	0.00	384.27	564.55	168.60	376.94	1.01	1,495.37	0.00	0.00
Mohammabad	0.00	1,138.54	524.32	118.31	162.42	0.95	1,944.54	0.00	0.00
Mujahidpur	0.00	306.38	177.01	14.92	66.29	0.00	564.60	0.00	0.00

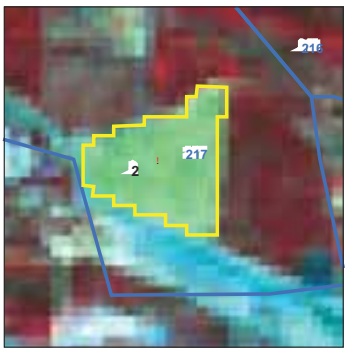
Pargi	0.00	295.87	288.95	426.97	659.77	0.00	1,671.56	0.00	0.00
Rangammaguda	0.00	378.00	124.36	61.02	37.32	0.00	600.70	0.00	0.00
Venkatapur	0.00	41.46	534.64	175.58	187.44	0.00	939.12	0.00	0.00
Total	**0.00**	**5,068.02**	**5,622.87**	**2,906.50**	**3,049.60**	**6.61**	**16,653.60**	**28.80**	**0.00**
TANDUR RANGE									
Adikicherla	0.00	231.75	231.71	287.54	136.78	0.00	887.78	0.00	0.00
Gingurthy	0.00	617.93	127.45	117.40	62.76	4.67	930.21	0.00	0.00
Indur	0.00	1,167.27	412.36	371.12	340.92	0.00	2,291.67	0.00	0.00
Juntpally	0.00	74.50	486.50	203.05	287.76	0.00	1,051.81	0.00	0.00
Kalkhoda	0.00	174.58	323.73	631.95	238.13	0.00	1,368.39	13.68	0.00
Mailwar	0.00	19.63	515.14	765.94	561.74	0.00	1,862.45	0.00	0.00
Nagulpally	0.00	399.30	340.24	253.21	698.72	5.61	1,697.08	0.00	0.00
Rampally	0.00	69.92	224.00	385.63	429.42	1.69	1,110.66	0.00	0.00
Tandur	0.00	0.00	0.00	215.35	25.19	0.00	240.54	0.00	0.00
Tattepally	0.00	113.97	93.43	50.77	135.42	0.00	393.59	0.00	0.00
Total	**0.00**	**2,868.85**	**2,754.56**	**3,281.96**	**2,916.84**	**11.97**	**11,834.18**	**13.68**	**0.00**
VIKARABAD RANGE									
Adhalpur	0.00	534.83	1,287.31	380.00	826.78	1.36	3,030.28	0.00	0.00
Dharpur	0.00	65.25	625.24	421.42	275.69	0.35	1,387.95	0.00	0.00
Dornal	0.00	45.79	227.44	276.86	390.44	0.00	940.53	0.00	0.00
Ekamamidi	0.00	68.39	322.71	499.05	631.61	0.00	1,521.76	0.00	0.00
Kothrepally	0.00	236.22	515.77	626.66	216.19	0.00	1,594.84	0.00	0.00
Madanpally	0.00	110.89	170.22	354.12	816.35	3.22	1,454.80	-1.60	1.60
Mansanpally	0.00	37.19	298.56	410.78	208.51	2.45	957.49	0.00	0.00
Mothukpally	0.00	224.92	325.08	394.55	818.59	0.00	1,763.14	0.00	0.00
Munnorsomaram	0.00	104.39	112.36	350.70	507.53	16.59	1,091.57	0.00	0.00
Rasnam	0.00	3.53	87.08	37.45	187.72	0.00	315.78	0.00	0.00
Rudraram	0.00	33.37	347.67	342.09	455.64	169.86	1,348.63	0.00	0.00
Vikarabad	0.00	512.58	261.86	555.25	225.83	0.00	1,555.52	0.00	0.00
Total	**0.00**	**1,977.35**	**4,581.30**	**4,648.93**	**5,560.88**	**193.83**	**16,962.29**	**-1.60**	**1.60**
Grand Total	**0.00**	**11,069.77**	**18,178.76**	**30,158.75**	**16,214.22**	**267.00**	**75,888.50**	**145.75**	**9.42**

Satellite Imageries

2012



2013



Longitude	78.49733° E
Latitude	17.59997° N
Area in Ha	7.73
Change	SF TO NF
Comp No.	217
Beat	Medchal
Range	Hyderabad (north)
Division	Hyderabad

4.10 MAHABOOBNAGAR DIVISION

4.10.1. Introduction

MahaboobNagar Forest Division lies in the western part of Mahaboobnagar District between latitudes 15^0 50' 12" N & 17^0 14' 13" N and longitudes 77^0 14' 55" E & 78^0 48' 07" E. Geographical area of the Division is **14068.25 Km^2** which is **76.15%** of the area of the District. The Division has an average altitude of 498 m above MSL. The district can be physiographically divided into more or less 2 distinct regions; the plains with low lying scattered hills and the extensive Amarabad-Farhabad plateau- a continuous range of hills of an average elevation of about 800 m above MSL extending more or less east-west along the Krishna river on the southern boundary of the district. The hill range is interspersed by several deep valleys which are almost inaccessible from the plains. Two important rivers, viz. Krishna and Tungabhadra flow through the district.

Land use pattern of the Division as in Mahaboobnagar is given in Table 4.10.1.

The climate of this Division is generally dry with temperatures ranging from 16.9^0 C to 45^{0}C and the annual rainfall is about 754 mm received mainly from south-west monsoons. The soils found in the Division are red sandy, black cotton and loamy.

Population of the Division is 3.54 million (2011 Census) which constitutes about 77.75 % of the population of the district, per capita forest area is **0.02 Ha** and the population density is 257 persons per Km^2. The livestock population is 4.82 million.

4.10.2. Record Forest Area:

The notified forest area of the Division is **573.18 Km^2** which **4.07%** of the geographical area. Reserved, Protected and un-classed forests constitute **442.44 Km^2** (77.19%), **118.77 Km^2** (20.72%) and **11.97 Km^2** (2.09%) of the forest area respectively.

As per Champion and Seth's classification the Forests of Division fall under Tropical Dry Deciduous, Tropical Moist deciduous, Tropical Semi-evergreen and Tropical Thorn Forest types.

Table 4.10.1: Land use pattern (for entire Geographical area)

Land use	Area in Km^2	Percentage
Forest including Scrub	616.85	4.38%
Agriculture	11853.49	84.26%
Land with Scrub	436.22	3.10%
Fallow Lands	412.62	2.93%
Settlements	36.58	0.26%
Not available for cultivation	250.11	1.78%
Water Bodies	462.38	3.29%
Total	**14068.25**	**100.00%**

Source: AS per LULC map prepared by NRSC, Hyderabad in 2007

4.10.3. Protected Area:

There is no Protected Area in the Division.

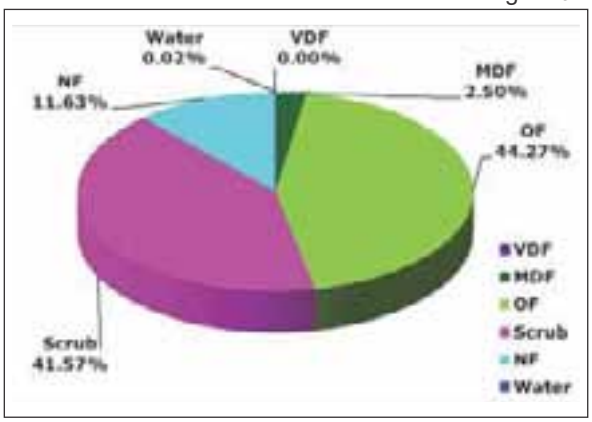
4.10.4. Community Forest Management:

There are 207 Vana Samrakshana Samities (VSSs) in the Division. An area of **455.62 Km^2** forests which is **79.49%** of the notified forests, is under the management of the VSSs.

4.10.5. Forest Cover:

The forest cover in the Division based on the interpretation of IRS R2 LISS-III 2013 (Dec 2013) and

Fig 4.10.1



LISS-IV data (2011-2014) is **289.75 Km²** which is **2.06%** of the geographical area. In terms of the forest canopy density classes the Division has **15.50 Km²** of Moderately Dense Forest and **274.25 Km²** Open Forest. The area of the Scrub is **257.52 Km²**, Non-Forest **72.06 Km²** and Water Bodies **0.15 Km²**. The distribution of the forest cover of the Division is shown in Fig 4.10.1.

4.10.6. Change in Forest Cover

The satellite images of 2012 and 2013 are shown in Figs 4.10.2 & 4.10.3 respectively and the changes during this period on the image of 2013.

Fig 4.10.2: LISS-III Imagery of Mahabubnagar Division of Oct. 2012



Fig 4.10.3: Vegetation Change Locations of Mahabubnagar Division on LISS-III Imagery of Dec. 2013



Comparison of the current forest cover with that of previous assessment year shows a positive change of **16.81 Ha** and is a negative change of **15.35 Ha**. However including the scrub, the positive change comes to **79.85 Ha** and the negative change **24.48 Ha**. The forest cover change matrix given in Table 4.10.2 reveals the changes from one class to another class.

The entire total positive change, is on account of growth in plantations raised. Out of the total negative change including scrub, **21.10 Ha** is on account of carrying advance operations for raising of plantation and **3.38 Ha** is on account of encroachments. As advance operations for raising of plantation are forest management interventions; the same are not considered as loss of forest cover. Hence the negative change on account of encroachments alone is taken as loss of forest cover. Therefore the **net loss of forest in the Division 3.38 Ha** only.

There are 51 Beats in the Division. Negative changes in forest cover are seen in 3 Beats and positive changes in 5 Beats only. There are no changes in remaining 43 Beats.

Details of forest cover in all Beats of the Division are shown in Table 4.10.3.

Table 4.10.2. Forest Cover Change Matrix: (Area in Km²)

2012	2013						Total of 2012
	VDF	MDF	OF	Scrub	NF	WATER	
Very Dense Forest	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Moderately Dense Forest	0.00	15.50	0.00	0.00	0.00	0.00	15.50
Open Forest	0.00	0.00	274.08	0.00	0.15	0.00	274.23
Scrub	0.00	0.00	0.00	256.89	0.09	0.00	256.98
Non-Forest	0.00	0.00	0.17	0.63	71.82	0.00	72.62
Water	0.00	0.00	0.00	0.00	0.00	0.15	0.15
Total of 2013	**0.00**	**15.50**	**274.25**	**257.52**	**72.06**	**0.15**	**619.48**
Net Change	0.00	0.00	0.02	0.54	-0.56	0.00	0.00

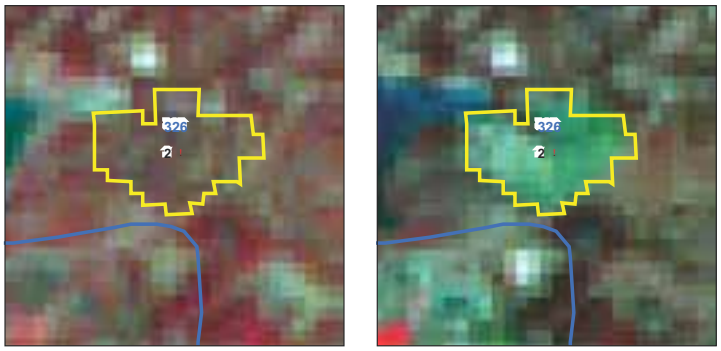
Table 4.10.3. Beat Wise Forest Cover: Area in Ha

Beat	VDF	MDF	OF	SF	NF	WB	Total	Net Change	Encr.
AMANGAL RANGE									
Amangal	0.00	0.00	189.11	424.75	30.48	0.00	644.34	0.00	0.00
Chandrayanpally	0.00	0.00	47.25	1,082.96	170.59	0.66	1,301.46	14.07	0.00
Charakonda	0.00	1.23	319.08	1,168.58	248.08	0.00	1,736.97	0.00	0.00
Cherikonda	0.00	3.33	822.18	812.35	196.60	1.08	1,835.54	0.00	0.00
Cherkur	0.00	0.00	32.73	539.55	67.89	1.81	641.98	0.00	0.00
Chhepununthala	0.00	0.00	240.48	529.56	58.21	0.00	828.25	0.00	0.00
Gokaram	0.00	2.91	623.45	789.05	109.37	0.00	1,524.78	10.32	0.00
Kadthal	0.00	3.98	1,083.68	452.80	25.90	0.00	1,566.36	0.00	0.00
Kamadhan	0.00	2.09	328.45	43.91	26.89	0.00	401.34	0.00	0.00
Karkalpahad	0.00	1.04	669.54	491.63	136.63	0.00	1,298.84	0.00	0.00
Mudwin	0.00	1.37	911.34	484.58	39.74	0.82	1,437.85	0.00	0.00
Total	**0.00**	**15.95**	**5,267.29**	**6,819.72**	**1,110.38**	**4.37**	**13,217.71**	**24.39**	**0.00**
KODANGAL RANGE									
Bomraspet	0.00	83.68	388.75	352.96	216.76	0.00	1,042.15	0.00	0.00
Dudyal	0.00	0.49	150.88	150.66	76.88	1.98	380.89	0.00	0.00
Gokafaslabad	0.00	0.00	127.52	408.88	28.85	0.00	565.25	0.00	0.00
Kodangal	0.00	12.89	440.65	237.76	84.22	0.00	775.52	0.00	0.00
Kothur	0.00	82.60	1,211.79	444.08	145.09	0.00	1,883.56	0.00	0.00
Tekulkote	0.00	11.80	383.16	440.17	191.82	0.00	1,026.95	0.00	0.00
Total	**0.00**	**191.46**	**2,702.75**	**2,034.51**	**743.62**	**1.98**	**5,674.32**	**0.00**	**0.00**
MAHBUBNAGAR RANGE									
Acharyapur	0.00	12.66	901.11	791.40	76.12	0.00	1,781.29	0.00	0.00
Appaipalli	0.00	57.70	883.11	641.95	68.71	0.00	1,651.47	0.00	0.00
Appannapally	0.00	235.68	1,104.05	51.39	49.50	0.00	1,440.62	0.00	0.00
Boyapally	0.00	166.12	822.14	139.19	58.28	0.00	1,185.73	8.20	0.00
Chandraspally	0.00	0.00	96.82	629.25	333.69	0.00	1,059.76	0.00	0.00
Darpally	0.00	5.48	814.14	360.34	242.60	0.00	1,422.56	16.28	0.00
Dhanwada	0.00	16.44	1,135.89	638.14	56.29	0.00	1,846.76	0.00	0.00
Gaddiguda	0.00	1.41	274.68	423.06	34.13	1.08	734.36	0.00	0.00
Gajulpet	0.00	3.29	905.77	449.94	113.44	0.00	1,472.44	0.00	0.00
Garlapad	0.00	20.86	918.36	686.16	128.29	0.00	1,753.67	9.88	0.00
Gundiyal	0.00	8.54	572.14	452.02	301.82	0.00	1,334.52	0.00	0.00
Jatram	0.00	0.00	624.02	1,139.71	165.53	2.27	1,931.53	0.00	0.00
Kistapur	0.00	24.77	1,060.83	930.63	148.16	0.00	2,164.39	0.00	0.00
Kotakonda	0.00	12.77	708.74	1,346.51	528.54	2.06	2,598.62	0.00	0.00
Mahaboobnagar	0.00	1.26	607.72	342.18	202.77	0.00	1,153.93	0.00	0.00
Malkapur-g	0.00	228.58	652.21	71.58	0.00	0.00	952.37	0.00	0.00
Malkapur-k	0.00	72.78	976.58	298.82	66.28	0.00	1,414.46	0.00	0.00
Manikonda	0.00	127.07	1,223.12	276.78	121.83	0.00	1,748.80	0.00	0.00
Teegalpally	0.00	134.39	751.92	13.07	69.67	0.00	969.05	0.00	0.00
Total	**0.00**	**1,129.80**	**15,033.35**	**9,682.12**	**2,765.63**	**5.41**	**28,616.31**	**34.36**	**0.00**

WANAPARTI RANGE									
Agrahar	0.00	3.16	357.60	748.37	505.89	1.82	1,616.84	0.00	0.00
Dattaipally	0.00	1.07	62.34	377.74	54.45	0.00	495.60	0.00	0.00
Gangaram	0.00	84.95	804.42	152.95	33.94	0.00	1,076.26	0.00	0.00
Gattu	0.00	0.00	2.04	520.68	152.74	0.00	675.46	0.00	0.00
Ghanpur	0.00	1.55	563.56	880.04	138.50	0.00	1,583.65	0.00	0.00
Gopalpet	0.00	4.73	95.72	215.82	46.43	0.00	362.70	0.00	0.00
Gudipally	0.00	0.00	3.31	164.49	12.94	0.79	181.53	0.00	0.00
Jangamaiahpally	0.00	102.81	985.46	351.24	70.46	0.00	1,509.97	0.00	0.00
Kashimnagar	0.00	0.23	153.46	307.25	481.60	0.00	942.54	0.00	0.00
Madhavaraopally	0.00	0.00	80.66	454.85	63.82	0.00	599.33	0.00	0.00
Pangal	0.00	6.60	80.15	410.88	87.29	0.00	584.92	0.00	0.00
Peedagudem	0.00	0.04	102.89	542.49	154.17	0.00	799.59	0.00	0.00
Remaddula	0.00	3.16	64.82	1,026.19	159.13	0.00	1,253.30	-3.38	3.38
Veeraipally	0.00	0.00	698.08	645.32	406.22	0.35	1,749.97	0.00	0.00
Wanaparthy	0.00	0.00	354.81	416.20	237.70	0.00	1,008.71	0.00	0.00
Total	**0.00**	**208.30**	**4,409.32**	**7,214.51**	**2,605.27**	**2.96**	**14,440.36**	**-3.38**	**3.38**
Division Total	**0.00**	**1,545.51**	**27,412.71**	**25,750.86**	**7,224.90**	**14.72**	**61,948.70**	**55.37**	**3.38**

Satellite Imageries

2012 **2013**



Longitude	77.94456° E
Latitude	16.77420° N
Area in Ha	5.75
Change	SF TO NF
Comp No.	326
Beat	Darpally
Range	Mahbubmagar
Division	**Mahbubmagar**



4.11 NALGONDA DIVISION

4.11.1. Introduction

Nalgonda Forest Division and District lies in the southern part of Telangana State between latitudes 16^0 21' 19" N & 17^0 48' 42" N and longitudes 78^0 36' 43" E & 80^0 04' 27" E. Geographical area of the Division is **12550.35 Km^2** Which is **88.16%** of the District. The Division has an average altitude of 421 M above MSL. Major streams falling in Division are Musi, Dindi, Peddavagu, Kangal, Alair and Halia, which are tributaries of Krishna river.

Land use pattern of the Division as in Nalgonda Division is given in Table 4.11.1.

The climate of this Division is generally dry with temperatures ranging from 17^0C to 40^0C and the annual rainfall is about 772 mm, received mainly from south-west monsoons.

Much of the soil is of red yellow type. Many areas have deep red soils derived from the decomposition of the granitic base rock. Riverine tracts have alluvial soils where paddy is grown. Due to the semi-arid climate, poor soils and lack of adequate irrigation, dry land farming is widely prevalent. Horticulture is also practiced; there are a number of Citrus and Mango plantations.

Population of the Division is 3.48 million (2011 Census), per capita forest area is **0.03 Ha** and the population density is 244 persons per Km^2. The livestock population is 1.35 million.

4.11.2. Recorded Forest Area:

The notified forest area of the Division is **450.29 Km^2** which is **3.59%** of the geographical area. As per Champion and Seth's classification the forests of Division fall under Tropical Dry Deciduous Forest type.

Table 4.11.1: Land use pattern (for entire Geographical area)

Land use	Area in Km^2	Percentage
Forest including Scrub	281.41	2.24%
Agriculture	10714.96	85.38%
Land with Scrub	833.94	6.64%
Fallow Lands	171.14	1.36%
Settlements	104.70	0.83%
Not available for cultivation	30.79	0.25%
Water Bodies	413.41	3.29%
Total	**12550.35**	**100.00%**

Source: AS per LULC map prepared by NRSC, Hyderabad in 2007

4.11.3. Protected Area:

There is no Protected Area in the Division.

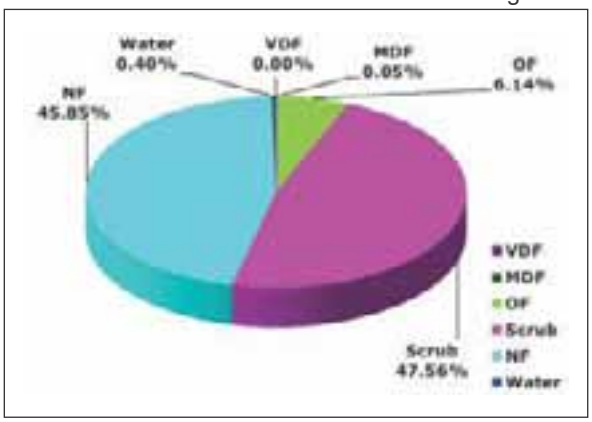
4.11.4. Community Forest Management:

There are 95 Vana Samrakshana Samities (VSSs) in the Division. An area of **188.41 Km^2** forests, which is **21.19%** of the notified forests, is under the management of the VSSs.

4.11.5. Forest Cover:

The forest cover in the Division based on the interpretation of IRS R2 LISS-III 2013 data (Oct-2012 to Feb-2014) and LISS-IV data (2011-2014) is **27.35 Km^2** which is **0.22%** of the geographical area. In terms of the forest canopy density classes the Division has **0.21** Km^2 of Moderately Dense Forest and **27.14 Km^2** of Open Forest. The area of the Scrub is **210.21 Km^2**, Non-Forest **202.65 Km^2** and Water Bodies **1.79 Km^2**. The distributions of the forest cover of the Division is shown in Fig 4.11.1.

Fig 4.11.1



4.11.6. Change in Forest Cover

The Satellite images of 2012 and 2013 are shown in Figs 4.11.2 & 4.11.3 respectively and the changes during this period are shown on the image of 2013.

Fig 4.11.2: LISS-III Imagery of Nalgonda Division of Oct. 2012

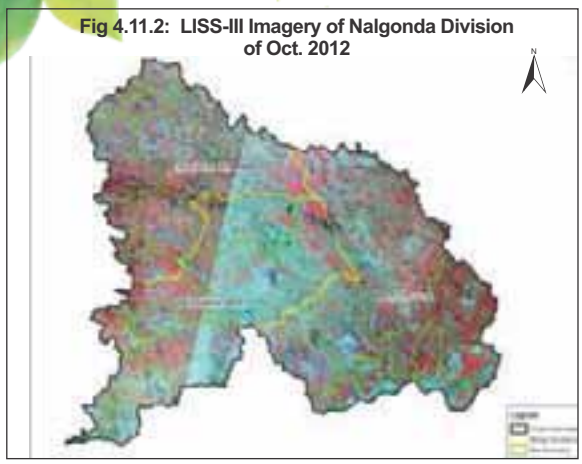
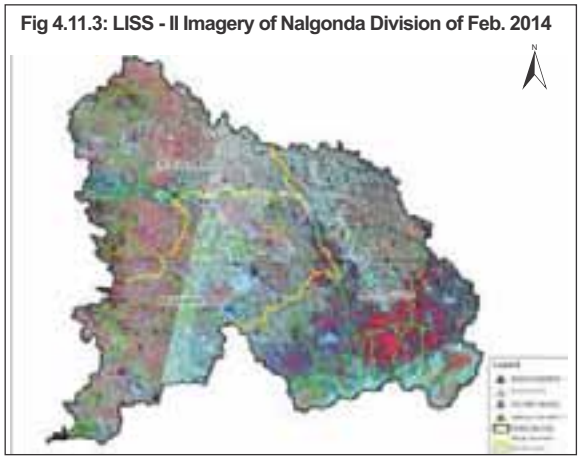


Fig 4.11.3: LISS - II Imagery of Nalgonda Division of Feb. 2014



Comparison of the current forest cover with that of previous assessment year shows a positive change of **35.95 Ha**. However including the scrub, the positive change comes to **89.53 Ha** and the negative change **34.08 Ha**. The forest cover change matrix given in Table 4.11.2 reveals the changes from one class to another class.

Out of the total positive change including scrub of, **81.70 Ha** is on account of growth in raised of plantations and **7.83 Ha** is improvement of forest due to protection and management interventions. Of the total negative change including scrub of, **28.03 Ha** is on account of clearance of jungle growth for raising of plantations and **6.05 Ha** is on account of encroachments. As clearance of jungle growth for raising of plantations is a forest management intervention the same is not considered as loss of forest cover. Thus only the negative change due to encroachments is taken as loss of forest cover. Therefore the **net loss of forest is 6.05 Ha** in the Division.

There are 36 Beats in the Division. Negative changes in forest cover are noticed in 3 Beats and Positive changes in forest cover are noticed in only 5 Beats. There are no changes in remaining 28 Beats.

Details of forest cover in all Beats of the Division are shown in Table 4.11.3.

Table 4.11.2. Forest Cover Change Matrix: (Area in Km^2)

2012	2013						Total of 2012
	VDF	MDF	OF	Scrub	NF	WATER	
Very Dense Forest	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Moderately Dense Forest	0.00	0.21	0.00	0.00	0.00	0.00	0.21
Open Forest	0.00	0.00	26.78	0.00	0.00	0.00	26.78
Scrub	0.00	0.00	0.00	209.67	0.34	0.00	210.01
Non-Forest	0.00	0.00	0.36	0.54	202.31	0.00	203.21
Water	0.00	0.00	0.00	0.00	0.00	1.79	1.79
Total of 2013	**0.00**	**0.21**	**27.14**	**210.21**	**202.65**	**1.79**	**442.00**
Net Change	0.00	0.00	0.36	0.20	-0.56	0.00	0.00



Table 4.11.3. Beat Wise Forest Cover: Area in Ha

Beat	VDF	MDF	OF	SF	NF	WB	Total	Net Change	Encr.
CHOUTUPPAL RANGE									
Aallapur	0.00	0.00	33.09	1,331.43	832.96	0.00	2,197.47	0.00	0.00
Bibinagar	0.00	0.00	57.06	614.95	193.41	0.54	865.96	0.00	0.00
Choutuppal	0.00	0.00	0.00	33.89	255.30	0.00	289.18	6.97	0.00
Dattaipally	0.00	0.00	113.70	462.10	116.76	0.00	692.56	0.00	0.00
Jalasingaram	0.00	0.00	145.97	188.11	6.25	0.00	340.34	0.00	0.00
Malkapur	0.00	0.00	0.49	207.03	702.80	0.00	910.32	0.00	0.00
Narayanpur	0.00	0.92	105.23	1,455.25	877.68	1.66	2,440.73	0.00	0.00
Raigir	0.00	0.00	0.72	115.64	46.52	0.00	162.88	0.00	0.00
Tippaiguda	0.00	0.00	70.93	948.40	1,115.56	3.16	2,138.05	0.00	0.00
Vasalamarri	0.00	0.00	300.15	662.36	91.91	0.00	1,054.43	0.00	0.00
Veerareddypalli	0.00	0.00	313.08	171.70	36.58	0.00	521.36	0.00	0.00
Total	**0.00**	**0.92**	**1,140.43**	**6,190.85**	**4,275.73**	**5.35**	**11,613.28**	**6.97**	**0.00**
DEVARAKONDA RANGE									
Chityal	0.00	3.78	74.28	172.91	45.07	2.10	298.13	-3.47	3.47
Goneboinapally	0.00	0.09	82.64	1,245.62	1,621.70	37.94	2,987.99	0.00	0.00
Gundlapally	0.00	0.92	49.45	1,037.71	752.26	25.05	1,865.39	39.52	0.00
Marriguda	0.00	0.00	101.53	600.64	114.12	1.55	817.85	0.00	0.00
Mohammadapur	0.00	0.00	8.02	208.80	125.51	0.00	342.33	0.00	0.00
Mudigonda	0.00	1.44	17.73	435.70	430.13	0.00	884.99	-28.03	0.00
Nalgonda	0.00	1.42	9.94	15.78	9.40	0.00	36.53	0.00	0.00
Takkadlapally	0.00	1.17	229.45	628.32	171.71	0.51	1,031.14	0.00	0.00
Yelgapally	0.00	0.00	47.12	935.98	259.68	0.56	1,243.34	0.00	0.00
Total	**0.00**	**8.81**	**620.15**	**5,281.44**	**3,529.58**	**67.71**	**9,507.70**	**8.02**	**3.47**
MIRYALGUDA RANGE									
Adavidevulapally	0.00	3.60	45.61	818.99	280.45	33.05	1,181.69	0.00	0.00
Chintlammaguda	0.00	0.00	2.80	118.62	1,549.15	0.00	1,670.56	0.00	0.00
Damercherla	0.00	0.29	8.38	673.37	1,057.13	15.36	1,754.55	0.00	0.00
Gorlaguda	0.00	0.16	24.79	375.40	815.51	0.00	1,215.86	0.00	0.00
Gundlapahad	0.00	0.00	32.03	314.83	607.22	0.09	954.17	0.00	0.00
Indergonda	0.00	3.23	129.31	292.33	81.57	0.00	506.44	0.00	0.00
Janpahad	0.00	0.00	20.39	728.38	1,633.24	0.00	2,382.01	0.00	0.00
Kallepally	0.00	0.00	10.47	1,099.56	472.98	0.00	1,583.01	5.04	0.00
Mallareddigudem	0.00	1.22	18.79	1,156.37	2,001.16	4.49	3,182.03	0.00	0.00
Miryalguda	0.00	2.05	24.14	298.05	202.58	5.75	532.57	0.00	0.00
Mulkacherla	0.00	0.25	396.33	811.80	65.14	21.34	1,294.86	0.00	0.00
Ragadapa	0.00	0.29	199.29	1,451.86	560.00	0.00	2,211.43	35.21	0.00
Raghunathapalem	0.00	0.00	0.91	612.92	1,409.51	7.01	2,030.35	0.00	0.00
Veeralapalem	0.00	0.17	40.24	795.74	1,724.49	18.84	2,579.49	0.00	0.00
Total	**0.00**	**11.27**	**953.47**	**9,548.21**	**12,460.14**	**105.94**	**23,079.02**	**40.25**	**0.00**
Division Total	**0.00**	**21.00**	**2,714.05**	**21,020.50**	**20,265.45**	**179.00**	**44,200.00**	**55.24**	**3.47**

4.12 BHADRACHALAM NORTH DIVISION

4.12.1. Introduction

Bhadrachalam North Forest Division lies in the northern part of Khammam District between latitudes 17^0 35' 47" N & 18^0 37' 46" N and longitudes 80^0 22' 22" E & 81^0 09' 40" E. Geographical area of the Division is **2048.92 Km²** which is **15.55%** of the area of District. The important rivers which flow through this Division are the Godavari and the Taliperu.

Land use pattern of the Division is given in Table 4.12.1.

The temperature ranges from 17^0 C to 37^0 C. The average rainfall in this Division is 1361.22 mm.

The soil types found mainly are black and red loams. The Rock found in this Division is Gneiss. The Mineral resources in this Division are Iron, Coal, Kankar and Lime stone.

The population of the Division is 0.197 million (2011 Census), per capita forest area **0.64 Ha** and the population density 96 persons per Km².

4.12.2. Recorded Forest Area:

The notified forest area of the Division is **1255.49 Km²** which is **61.28%** of the geographical area. As per Champion and Seth's classification the forests of Division fall under Tropical dry Deciduous, Tropical Moist Deciduous, Tropical Semi-evergreen, Dry Teak and Tropical Thorn Forest types.

4.12.3. Protected Area:

There is no protected area in the Division.

4.12.4. Community Forest Management:

There are 54 Vana Samrakshana Samities (VSSs) or Joint Forest Protection Committees (JFPCs) in the Division. An area of **92.74 Km²**, which is **7.38%** of the forest area, is under the management of VSSs.

4.12.5. Forest Cover:

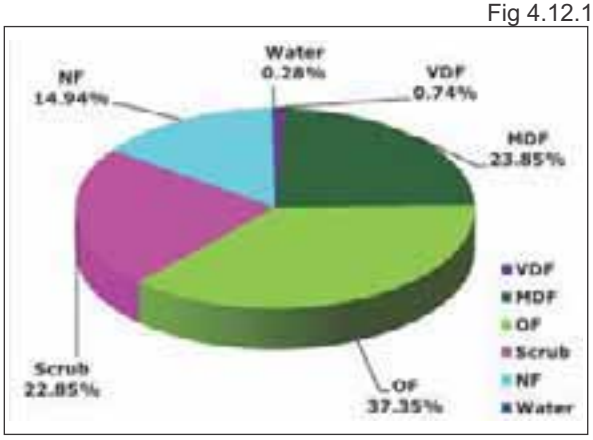
The forest cover in the Division based on the interpretation of IRS R2 LISS-III 2013 data (Feb 2014) and LISS-IV data (2011-2014) is **777.57** Km² which is **37.95%** of the geographical area. In terms of the forest canopy density classes the Division has **9.27 Km²** of Very Dense Forests, **299.39 Km²** of Moderately Dense Forests and **468.91** Km² of Open Forests. The area of the Scrub is **286.93 Km²**, Non-Forest **187.54 Km²** and Water Bodies **3.46 Km²**. The distribution of the forest cover of the Division is shown in Fig 4.12.1.

Table 4.12.1: Land use pattern (for entire Geographical area)

Land use	Area in Km²	Percentage
Forest including Scrub	1128.10	55.06%
Agriculture	506.08	24.70%
Land with Scrub	164.28	8.02%
Fallow Lands	151.07	7.37%
Grasslands	9.34	0.46%
Settlements	6.86	0.33%
Vegetation outside Forest	35.36	1.73%
Water Bodies	47.83	2.33%
Total	**2048.92**	**100.00%**

Source: AS per LULC map prepared by NRSC, Hyderabad in 2007

Fig 4.12.1



4.12.6. Change in Forest Cover

The satellite images of 2012 and 2013 are shown in Fig 4.12.2 & 4.12.3 respectively and the changes between this period on the image of 2013.

Fig 4.12.2: LISS-III Imagery of Badrachalam North Division of Oct. 2012



Fig 4.12.3: Vegetation Change Locations of Badrachalam Notrth Division on LISS-III Imagery of Feb. 2014



Comparison of the current forest cover with that of previous assessment year shows a positive change of **118.43 Ha** and is a negative change of **48.10 Ha**. However including the scrub, the positive change comes to **146.79 Ha** and the negative change **48.10 Ha**. The forest cover change matrix given in Table 4.12.2 reveals the changes from one class to another class.

The entire total positive change is on account of growth in plantations raised. Out of the total negative change of **48.10 Ha** including scrub, **17.90 Ha** is on account of carrying advance operations for raising of plantation and **30.20 Ha** is on account of encroachments. As advance operations for raising of plantation etc. are forest management interventions; the same are not considered as loss of forest cover. Hence the negative change on account of encroachments alone is taken as loss of forest cover. Therefore, the **net loss of forest in the Division 30.20 Ha** only.

There are 52 Beats in the Division. Negative changes are noticed in 6 Beats and positive change in 3 Beats. There is no change in the remaining 43 Beats.

Details of forest cover in all Beats of the Division are shown in Table 4.12.3.

Table 4.12.2. Forest Cover Change Matrix: (Area in Km^2)

2012	2013						Total of 2012
	VDF	MDF	OF	Scrub	NF	WATER	
Very Dense Forest	9.27	0.00	0.00	0.00	0.00	0.00	9.27
Moderately Dense Forest	0.00	299.39	0.00	0.00	0.35	0.00	299.74
Open Forest	0.00	0.00	467.73	0.00	0.14	0.00	467.87
Scrub	0.00	0.00	0.00	286.65	0.00	0.00	286.65
Non-Forest	0.00	0.00	1.18	0.28	187.05	0.00	188.51
Water	0.00	0.00	0.00	0.00	0.00	3.46	3.46
Total of 2013	**9.27**	**299.39**	**468.91**	**286.93**	**187.54**	**3.46**	**1255.49**
Net Change	0.00	-0.35	1.04	0.28	-0.97	0.00	0.00

Table 4.12.3. Beat Wise Forest Cover: Area in Ha

Beat	VDF	MDF	OF	SF	NF	WB	Total	Net Change	Encr.
BHADRACHALAM NORTH RANGE									
Arlagudem	0.00	370.58	371.78	65.27	614.23	1.78	1,423.64	0.00	0.00
Cherupalli	0.00	67.22	114.10	70.12	325.22	9.84	586.50	0.00	0.00
Jaggaram	0.00	301.19	59.38	40.87	3.79	0.00	405.23	0.00	0.00
Kallerukunta	0.00	386.90	193.75	68.39	239.66	0.00	888.70	-1.57	0.00
Madhavaraopet	0.00	3.70	70.33	24.81	30.63	0.00	129.47	0.00	0.00
Nimmalagudem	0.00	175.95	267.51	56.77	225.78	0.00	726.01	9.83	0.00
Palamadugu	0.00	0.00	0.02	0.19	20.05	0.00	20.26	0.00	0.00
Singaram	0.00	264.22	168.23	73.84	1,101.88	0.00	1,608.17	0.00	0.00
Tunikicheruvu	0.00	6.06	69.37	33.53	25.63	0.00	134.59	108.60	0.00
Total	**0.00**	**1,575.82**	**1,314.47**	**433.79**	**2,586.87**	**11.62**	**5,922.57**	**116.86**	**0.00**
CHERLA RANGE									
Alubaka	0.00	63.25	713.08	488.03	216.97	0.00	1,481.33	0.00	0.00
Chalamala	293.26	1,730.84	1,791.03	1,276.71	472.47	1.50	5,565.81	0.00	0.00
Cherla	0.00	138.80	343.79	268.58	384.64	112.04	1,247.85	0.00	0.00
Doli	52.36	1,325.42	1,838.84	2,063.73	945.12	0.00	6,225.47	0.00	0.00
Edira	2.89	570.83	1,124.34	300.38	132.34	0.00	2,130.78	0.00	0.00
Gannavaram Colony	72.29	1,014.65	987.84	329.31	13.19	0.00	2,417.28	0.00	0.00
Oddipeta	5.55	682.36	869.68	568.82	348.41	31.67	2,506.49	0.00	0.00
Pusuguppa	0.00	1,077.52	652.74	116.30	126.08	10.64	1,983.28	-21.70	21.70
Ramachandrapuram	154.21	2,966.12	4,777.46	3,338.61	1,448.65	14.84	12,699.89	0.00	0.00
Subbampeta	26.82	1,250.12	760.73	270.97	132.07	0.08	2,440.79	0.00	0.00
Suraveedu	0.00	167.76	772.20	783.20	390.35	23.10	2,136.61	0.00	0.00
Total	**607.38**	**10,987.67**	**14,631.73**	**9,804.64**	**4,610.29**	**193.87**	**40,835.58**	**-21.70**	**21.70**
DUMMUGUDEM RANGE									
Anjubaka	0.00	140.81	82.74	28.10	247.36	0.00	499.01	0.00	0.00
Bodanelly	10.59	1,320.52	834.49	278.45	201.19	0.00	2,645.24	-3.58	0.00
Devarapally	0.00	272.65	1,126.54	474.11	489.30	0.00	2,362.60	0.00	0.00
Kothuru	0.00	606.15	381.22	214.33	1,065.40	1.12	2,268.22	-7.40	7.40
Kurnapalli	10.16	618.06	601.13	252.02	282.44	0.00	1,763.81	0.00	0.00
Mulakanapalli	0.00	276.23	368.59	159.53	83.69	0.00	888.04	0.00	0.00
Parnasala	0.00	187.70	425.06	79.53	64.99	1.74	759.02	-5.86	0.00
Pedamidisileru	1.55	1,077.68	1,243.66	391.31	389.23	0.00	3,103.43	0.00	0.00
R.kothagudem	0.00	198.62	812.24	308.24	311.92	0.00	1,631.02	0.00	0.00
Tyagada	0.00	477.22	428.20	210.12	1,090.68	0.02	2,206.24	-7.99	1.10
Uyyalamadugu	31.85	2,113.14	2,018.58	1,165.36	969.62	62.79	6,361.34	0.00	0.00
Total	**54.15**	**7,288.78**	**8,322.45**	**3,561.10**	**5,195.82**	**65.67**	**24,487.97**	**-24.83**	**8.50**
VENKATAPURAM RANGE									
Arunachalapuram	4.21	1,469.29	3,265.13	1,676.91	828.52	10.70	7,254.76	0.00	0.00
Bhuvanapalli	0.00	66.69	553.28	360.99	107.10	0.54	1,088.60	0.00	0.00
Cherukuru	0.00	0.03	15.77	39.37	95.24	0.00	150.41	0.00	0.00

Dulapuram	0.00	219.58	1,146.77	685.70	468.46	8.15	2,528.66	0.00	0.00
Kadaikal	0.57	1,325.16	5,274.01	2,928.05	822.50	8.80	10,359.09	0.00	0.00
Nuguru	0.00	40.84	225.90	221.16	374.93	16.09	878.92	0.00	0.00
Pavanoor N	7.41	1,079.52	2,038.40	844.26	112.33	0.00	4,081.92	0.00	0.00
Pavanoor S	68.32	1,027.10	1,743.85	1,643.11	650.66	23.05	5,156.09	0.00	0.00
Penugolu N	102.02	1,625.80	2,401.81	1,766.41	860.27	0.00	6,756.31	0.00	0.00
Penugolu S	49.81	880.36	1,665.05	946.64	170.78	0.00	3,712.64	0.00	0.00
Pragallapally	0.00	329.62	874.24	175.01	32.51	0.00	1,411.38	0.00	0.00
Pusuru	0.00	145.37	577.25	350.85	337.38	0.00	1,410.85	28.36	0.00
Tekulagudem	31.93	1,587.63	2,437.84	3,137.97	1,413.93	7.36	8,616.66	0.00	0.00
Venkatapuram	1.16	289.46	404.01	116.09	87.26	0.00	897.98	0.00	0.00
Total	**265.43**	**10,086.45**	**22,623.31**	**14,892.52**	**6,361.88**	**74.69**	**54,304.28**	**28.36**	**0.00**
Division Total	**926.96**	**29,938.72**	**46,891.96**	**28,692.05**	**18,754.85**	**345.85**	**125,550.39**	**98.69**	**30.20**

Satellite Imageries

2012



2013



Longitude	80.94994° E
Latitude	17.76337° N
Area in Ha	9.83
Change	NF TO OF
Comp No.	36
Beat	Nimmalagudem
Range	Badrachalam
Division	**Badrachalam North**



4.13 KHAMMAM DIVISION

4.13.1. Introduction

Khammam Forest Division lies in the southern part of Khammam district between latitudes 16^0 46' 2" N & 17^0 33' 35" N and longitudes 79^0 48' 10" E & 81^0 16' 37" E. Geographical area of the Division is **6004.05 Km^2** which is **45.55%** of the area of the district. The rivers in this Division are Munneru, Paleru, Akheru and Wyra.

Land use pattern of the Division is given in Table 4.13.1.

The average highest temperature in the summer is 47^0 C and the minimum average temperature in December is 14^{0}C and the average annual rainfall is 997.96 mm, received mainly from Southwest monsoons.

The soil types found mainly in this Division are sandy soils, black, red loamy and skeletal. The rock formations found in this Division are Archaens, Puranas and Gondwanas. The Mineral resources in this Division are coal, Iron ore, lime stone, marble, barytes, graphite, chromite, mica, garnet, kyanite and building stones.

Population of the Division is 1.60 million (2011 Census), per capita forest area is **0.82 Ha** and the population density is 266 persons per Km^2.

4.13.2. Recorded Forest Area:

The notified forest area of the Division is **1246.19 Km^2** which is **20.76%** of the geographical area. Reserved, Protected and un-classed forests constitute **1131.25 Km^2** (90.78 %), **112.74 Km^2** (9.04%) and **2.2 Km^2** (0.18%) of the forest area respectively.

As per Champion and Seth's classification the Forests of Division fall under Tropical dry deciduous, Tropical moist deciduous, Tropical Semi-evergreen, Dry Teak and Tropical Thorn Forest types.

Table 4.13.1: Land use pattern (for entire Geographical area)

Land use	Area in Km^2	Percentage
Forest including Scrub	1242.49	20.69%
Agriculture	4143.12	69.01%
Land with Scrub	126.96	2.11%
Fallow Lands	18.75	0.31%
Settlements	78.02	1.30%
Vegetation outside Forest	303.10	5.05%
Water Bodies	91.61	1.53%
Total	**6004.05**	**100.00%**

Source: AS per LULC map prepared by NRSC, Hyderabad in 2007

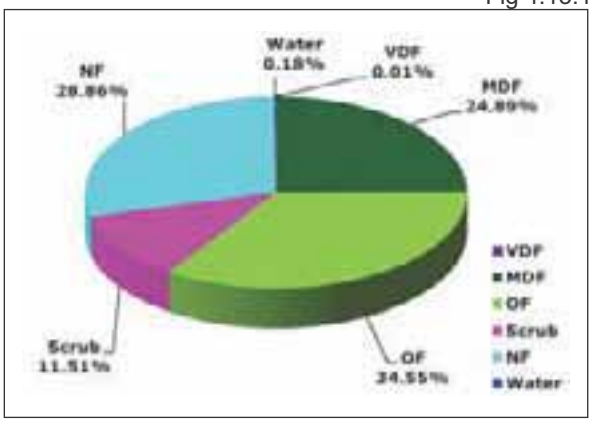
4.13.3. Protected Area:

There is no protected area in the Division.

4.13.4. Community Forest Management:

There are 110 Vana Samrakshana Samithies (VSSs) in the Division. **238.76 Km^2** forest area, which constitutes **18.06%** of the forest area, is under the management of VSSs.

Fig 4.13.1



4.13.5. Forest Cover:

The forest cover in the Division based on the interpretation of IRS R2 LISS-III 2013 data (Jan 2014) and LISS-IV data (2011-2014) is **786.17 Km^2** which is **13.09%** of the geographical area. In terms of the forest canopy density classes the Division has **0.15 Km^2** Very Dense Forests, **329.12 Km^2** Moderately Dense Forests and **456.90 Km^2** Open Forest. The area of the Scrub is **152.16**

Km², Non-Forest **381.61 Km²** and Water Bodies **240** Km². The distribution of the forest cover of the Division is shown in Fig 4.13.1.

4.13.6. Change in Forest Cover

The satellite images of 2012 and 2013 are shown in Figs. 4.13.2 & 4.13.3 respectively and the changes during this period are shown on the image of 2013.

Fig 4.13.2: LISS-III Imagery of Khammam Division of Oct. 2012

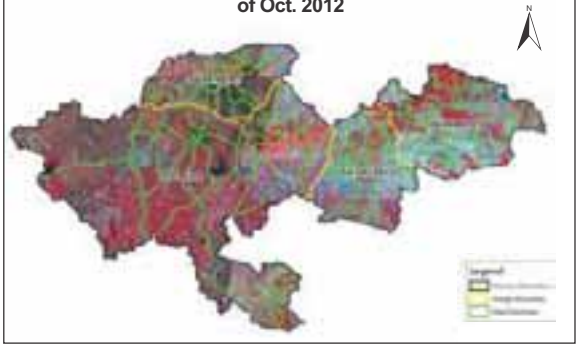
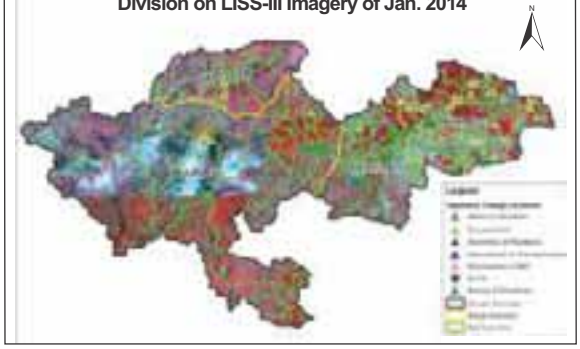


Fig 4.13.3: Vegetation Change Locations of Khammam Division on LISS-III Imagery of Jan. 2014



Comparison of the current forest cover with that of previous assessment year shows a positive change of **7.03 Ha** and negative change of **601.19 Ha**. However, including the scrub, the total positive change comes to **33.27 Ha** and the total negative change comes to **692.90 Ha**. The forest cover change matrix given in Table 4.13.2 reveals the changes from one class to another class.

The entire total positive change, is on account of growth in plantations raised. Out of the total negative change including scrub, **478.05 Ha** is on account of carrying advance operations for raising of plantation, **65.39 Ha** is on account of harvesting of plantations, **42.71 Ha i**s an account of diversion of forest lands for non-forestry purpose and **106.75 Ha** is on account of encroachments. As advance operations and harvesting of plantations, diversion of forest lands etc. are forest management interventions; the same are not considered as loss of forest cover. Hence the negative change on account of encroachments alone is taken as loss of forest cover. Therefore the **net loss of forest in the Division 106.75 Ha** only.

There are 82 Beats in the Division. Negative changes are noticed in 20 Beats and positive change in 2 Beats only. There are no changes in the remaining 60 Beats.

Details of forest cover in all Beats of the Division are shown in Table 4.13.3.

Table 4.13.2. Forest Cover Change Matrix: (Area in Km²)

2012	2013						Total of 2012
	VDF	MDF	OF	Scrub	NF	WATER	
Very Dense Forest	0.15	0.00	0.00	0.00	0.00	0.00	0.15
Moderately Dense Forest	0.00	329.12	0.00	0.00	1.29	0.00	330.41
Open Forest	0.00	0.00	456.83	0.05	4.67	0.00	461.55
Scrub	0.00	0.00	0.00	151.85	0.92	0.00	152.77
Non-Forest	0.00	0.00	0.07	0.26	374.73	0.00	375.06
Water	0.00	0.00	0.00	0.00	0.00	2.40	2.40
Total of 2013	**0.15**	**329.12**	**456.90**	**152.16**	**381.61**	**2.40**	**1322.34**
Net Change	0.00	-1.29	-4.65	-0.61	6.55	0.00	0.00



Table 4.13.3. Beat Wise Forest Cover: Area in Ha

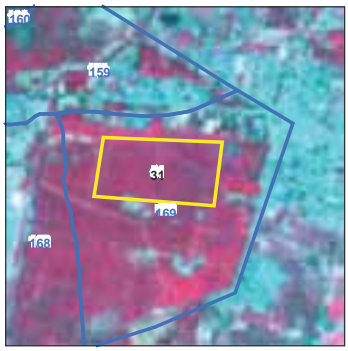
Beat	VDF	MDF	OF	SF	NF	WB	Total	Net Change	Encr.
DAMMAPET RANGE									
Achutapuram	1.85	236.43	750.62	448.49	350.95	0.00	1,788.34	-28.05	0.00
Anantharam	0.00	567.60	638.16	175.52	956.98	12.71	2,350.98	0.00	0.00
Ankampalem	0.00	1,330.20	994.31	240.42	170.36	1.00	2,736.29	0.00	0.00
Aswaraopet	0.00	253.70	1,049.03	439.77	519.07	0.03	2,261.61	0.00	0.00
Dammapet	0.00	259.69	471.84	129.54	546.77	0.00	1,407.84	0.00	0.00
Durdapadu	0.00	468.77	1,319.42	281.25	1,378.66	0.00	3,448.10	-1.97	1.97
Gandugulapalli	0.00	251.26	967.72	178.59	489.89	0.00	1,887.47	-68.37	0.00
Gopannagudem	0.00	372.09	266.23	136.18	1,123.93	0.66	1,899.09	0.00	0.00
Katkur	0.00	2,094.08	599.08	18.16	57.16	2.84	2,771.32	0.00	0.00
Maddulamada	0.00	1,359.36	1,033.98	87.32	301.74	0.35	2,782.75	0.00	0.00
Mandalpalli	0.59	229.05	312.78	64.05	119.90	0.00	726.37	-4.78	0.00
Mustibanda	3.04	433.20	314.79	87.55	208.84	0.00	1,047.42	0.00	0.00
Nagupalli	0.00	876.33	1,201.58	122.64	105.10	1.62	2,307.27	-23.37	0.00
Nallamudi	0.59	661.48	1,619.37	271.15	633.08	0.00	3,185.67	-21.62	3.45
Narayanapuram	0.00	520.51	1,182.79	235.83	881.71	13.85	2,834.69	-58.05	0.00
Patwarigudem	0.00	633.59	506.26	56.09	128.81	0.00	1,324.75	-8.22	8.22
Pusakunta	0.00	2,679.57	639.17	23.90	95.78	0.00	3,438.42	-31.16	0.00
Tirumalkunta	0.00	3,035.01	1,131.73	100.18	307.26	0.00	4,574.19	-2.02	2.02
Vinayakapuram	0.00	882.85	1,283.41	212.56	996.28	0.00	3,375.09	-16.82	0.00
Total	**6.06**	**17,144.79**	**16,282.26**	**3,309.20**	**9,372.28**	**33.07**	**46,147.66**	**-264.43**	**15.66**
KAREPALLI RANGE									
Burdaraghavapuram	0.00	277.10	1,041.89	96.06	471.71	0.00	1,886.76	0.00	0.00
Cheemalapadu	0.02	6.06	286.42	130.00	453.83	0.00	876.32	0.00	0.00
Gadepadu	0.00	2.16	22.94	66.40	756.34	0.00	847.84	0.00	0.00
Kesupalli	0.00	59.94	615.86	190.59	1,086.72	0.00	1,953.11	0.00	0.00
Madampalli	0.00	0.22	30.60	124.47	486.19	0.00	641.48	0.00	0.00
Maddulapalli	0.00	216.31	391.96	221.60	723.43	4.27	1,557.56	0.00	0.00
Muthyalampadu	0.00	1.61	87.15	121.41	2,132.76	0.00	2,342.93	0.00	0.00
N.s. Kothur	0.00	1.70	21.44	134.82	1,304.76	0.00	1,462.72	0.00	0.00
Ootokur	0.00	460.92	430.10	204.87	847.41	0.00	1,943.29	-9.80	9.80
Papkol	0.00	200.66	1,493.86	541.96	417.14	0.00	2,653.62	0.00	0.00
Rajaraopet	0.00	150.06	1,034.44	223.20	318.30	0.00	1,726.00	0.00	0.00
Ramannapalem	0.00	0.13	355.45	232.13	1,288.90	0.00	1,876.61	0.00	0.00
Regaboinagudem	0.00	11.60	160.72	166.11	1,641.35	0.02	1,979.81	0.00	0.00
Relakayalapalli	0.00	15.42	526.18	175.61	769.46	0.00	1,486.67	0.00	0.00
Singareni/karepalli	0.00	2.06	44.59	17.02	127.74	0.00	191.42	0.00	0.00

Tadkalpudi	0.00	0.56	8.86	14.40	469.73	0.00	493.55	0.00	0.00
Timmaraopeta	0.00	281.72	367.84	72.12	599.23	0.00	1,320.90	-4.79	4.79
Total	**0.02**	**1,688.21**	**6,920.29**	**2,732.77**	**13,895.01**	**4.29**	**25,240.59**	**-14.59**	**14.59**
SATHUPALLI RANGE									
Annapureddipalli	0.00	516.13	461.23	37.48	63.54	0.00	1,078.38	0.00	0.00
Bhavanapalem	0.00	63.07	292.26	160.49	284.29	0.07	800.18	0.00	0.00
Buggapadu	0.00	108.53	614.05	252.59	430.03	9.98	1,415.18	-117.98	45.07
Chandraipalem	0.00	499.90	356.74	25.44	32.57	0.00	914.65	0.00	0.00
Cherukupalli	0.00	345.31	644.90	288.67	390.74	8.52	1,678.14	0.00	0.00
Chowdaram	0.00	11.80	225.23	193.37	322.60	0.00	753.00	0.00	0.00
Gollagudem	0.00	2.73	201.66	159.48	279.07	61.70	704.65	-54.55	0.00
Kakarlapalli	0.00	77.02	631.02	408.91	679.45	1.05	1,797.45	-71.86	9.31
Kistaram	0.00	19.20	200.70	107.90	116.40	0.00	444.20	0.00	0.00
Kompalli	0.00	42.83	654.26	377.28	63.66	15.61	1,153.63	-23.91	0.00
Lankapalli	0.00	0.60	127.23	201.21	495.77	0.01	824.82	0.00	0.00
Pentalam	0.00	501.63	953.28	200.53	506.18	0.00	2,161.63	0.00	0.00
R.c. Puram	0.00	197.91	459.82	158.70	205.30	57.73	1,079.46	0.00	0.00
Rajapuram(namaram)	0.00	98.17	1,159.64	492.29	389.50	0.00	2,139.59	0.00	0.00
Rudrakshapalli	0.00	461.47	979.00	94.14	448.62	4.70	1,987.92	-22.12	22.12
Sathupalli	0.00	18.87	444.46	292.32	466.49	0.00	1,222.15	-58.39	0.00
Yatalkunta	0.00	663.99	558.08	171.25	163.50	0.00	1,556.82	0.00	0.00
Total	**0.00**	**3,629.16**	**8,963.54**	**3,622.07**	**5,337.71**	**159.37**	**21,711.85**	**-348.81**	**76.50**
TALLADA RANGE									
Arkalpadu	0.00	167.60	128.37	53.05	899.13	1.83	1,249.98	0.00	0.00
Bhimaram	0.00	183.30	817.46	398.76	80.24	4.94	1,484.71	0.00	0.00
Buchireddipalem	0.00	0.00	138.94	303.10	48.65	0.00	490.70	0.00	0.00
Burugugudem	0.00	734.41	716.90	258.11	226.12	0.00	1,935.54	0.00	0.00
Chintagurthi	0.00	5.51	43.89	51.11	1,159.09	21.68	1,281.27	0.00	0.00
Erlapudi	0.09	248.11	235.44	134.33	1,012.53	1.87	1,632.37	0.00	0.00
Gopalpet	0.00	973.41	446.08	38.97	169.18	0.00	1,627.63	0.00	0.00
Gowraram	0.00	225.75	1,230.49	474.85	90.78	0.00	2,021.87	0.00	0.00
Gubbagurthi	0.00	280.10	467.95	125.35	550.70	0.67	1,424.77	0.00	0.00
Gudur	1.51	805.79	404.01	223.69	236.19	0.00	1,671.19	0.00	0.00
Gundepudi	0.00	47.13	333.57	293.77	662.63	0.68	1,337.78	0.00	0.00
Guntipalligoparam	0.00	37.15	529.11	194.96	47.75	0.00	808.97	0.00	0.00
Kacharam	0.00	20.21	460.87	545.82	143.80	0.00	1,170.71	0.00	0.00
Kallur	0.00	1,009.10	755.81	375.01	156.67	2.62	2,299.20	0.00	0.00
Lingagudem	0.00	169.11	307.79	247.47	179.05	0.00	903.42	-31.80	0.00
Lokaram	7.36	1,495.04	466.20	100.19	29.19	0.00	2,097.98	0.00	0.00
Maddukur	0.00	603.44	1,571.95	239.25	230.82	0.00	2,645.46	0.00	0.00

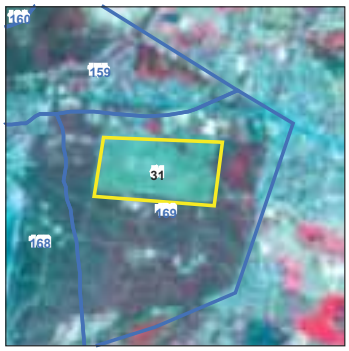
Mekalkunta	0.02	98.45	256.97	172.39	1,115.96	0.68	1,644.47	0.00	0.00
Nacharam	0.00	467.46	566.60	69.57	568.99	0.00	1,672.62	0.00	0.00
Nallabandabodu	0.00	967.39	828.31	134.50	519.94	0.00	2,450.14	0.00	0.00
Pangidi	0.03	4.39	31.56	18.48	113.65	0.00	168.11	0.00	0.00
Ravikampad	0.00	205.11	914.85	326.43	341.85	0.00	1,788.23	0.00	0.00
Remidicherla	0.00	84.20	409.55	186.39	26.71	0.00	706.85	0.00	0.00
Tallapenta	0.00	1,123.12	779.93	204.40	56.98	5.85	2,170.29	0.00	0.00
Tummalapalli	0.00	80.08	258.56	150.34	696.73	2.16	1,187.88	0.00	0.00
Venkatagiri	0.00	413.05	280.11	77.28	151.47	0.83	922.75	0.00	0.00
Venkatapuram	0.00	2.36	142.83	155.60	38.28	0.00	339.07	0.00	0.00
Total	**9.01**	**10,450.76**	**13,524.11**	**5,553.17**	**9,553.10**	**43.82**	**39,133.96**	**-31.80**	**0.00**
Division Total	**15.09**	**32,912.92**	**45,690.20**	**15,217.21**	**38,158.10**	**240.54**	**132,234.06**	**-659.63**	**106.75**

Satellite Imageries

2012



2013



Longitude	80.82227° E
Latitude	17.20827° N
Area in Ha	46.84
Change	OF TO NF
Comp No.	169
Beat	Sathupalli
Range	Sathupalli
Division	**Khammam**



4.14 KOTHAGUDEM DIVISION

4.14.1. Introduction

Kothagudem Forest Division lies in the western part of Khammam district between latitudes 17^0 19' 55" N & 18^0 4' 49" N and longitudes 80^0 02' 46" E & 80^0 50' 44" E. Geographical area of the Division is **2500.35 Km^2** which is **18.97%** of the geographical area of the district. Pancha Pandavulu is the highest peak of this Division with an altitude of 729.38 m above MSL. The area is undulating and interrupted with hills and hillocks of igneous rocks with elevation ranging from 12 to 500 m. Kalakandavagu stream forms major source of water for Bayyaram cheruvu. Morredu river and Kinnerasani river are the perennial sources of water in this Division.

Land use pattern of the Division is given in Table 4.14.1.

The climate of this Division is generally dry with temperatures ranging from 18^{0}C to 50^{0}C and the annual rainfall is about 934.69 mm, received mainly from south-west monsoons.

The most important mineral deposit in the Division is coal. The other minerals are iron ore, barytes, graphite and copper ore. The rocks found in the Division are lime stone, marble and granite. The soil types found mainly are sandy soils, black cotton, red alluvial loam and skeletal.

Population of the Division is 0.472 million (2011 Census), per capita forest area is **0.36 Ha** the population density is 188 persons per Km^2.

Table 4.14.1: Land use pattern (for entire Geographical area)

Land use	Area in Km^2	Percentage
Forest including Scrub	1412.13	56.48%
Agriculture	879.50	35.18%
Land with Scrub	70.21	2.81%
Fallow Lands	22.30	0.89%
Grasslands	0.49	0.02%
Settlements	20.80	0.83%
Vegetation outside Forest	75.75	3.03%
Water Bodies	19.17	0.77%
Total	**2500.35**	**100.00%**

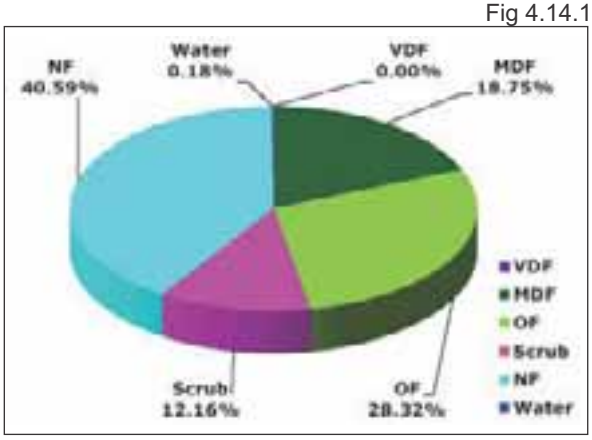
Source: AS per LULC map prepared by NRSC, Hyderabad in 2007

4.14.2. Recorded Forest Area:

The notified forest area of the Division is **1434.54 Km^2** which is **57.37%** of the geographical area. Reserved and Protected forests constitute **1321.03 Km^2** (85.89%) and **217.01 Km^2** (14.11%) of the forest area respectively. **103.50 Km^2** of notified forest area of the Division is transferred to Paloncha WLM Division.

As per Champion and Seth's classification, the Forests of Division fall under Tropical Dry Deciduous, Tropical Moist Deciduous, Tropical Semi-evergreen, Dry Teak and Tropical Thorn Forest types.

Fig 4.14.1



4.14.3. Protected Area:

There is no PA in this Division. Out of o**ld Kothagudem Division** an area of 103.50 Km^2 is transferred to **Paloncha WLM Division**.

4.14.4. Community Forest Management:

There are 106 Vana Samrakshana Samithies (VSSs) in the Division. **238.62 Km^2** forest area, which constitutes **14.17%** of forest area, is under the management of VSSs.

4.14.5. Forest Cover:

The forest cover in the Division based on the interpretation of IRS R2 LISS-III 2013 data (Feb 2014)

and LISS-IV data (2011-2014) is 792.56 **Km²** which is 31.70% of the geographical area. In terms of the forest canopy density classes the Division has **315.77 Km²** Moderately Dense Forests and **476.80 Km²** Open Forest. The area of the Scrub is **204.74 Km²**, Non-Forest **683.54 Km²** and Water Bodies 3.51 Km2. The distribution of the forest cover of the Division is shown in Fig 4.14.1

4.14.6. Change in Forest Cover

The Satellite image of 2012 and 2013 are shown in Figs 4.14.2 & 4.14.3 respectively and the changes during this period are shown on the image of 2013.

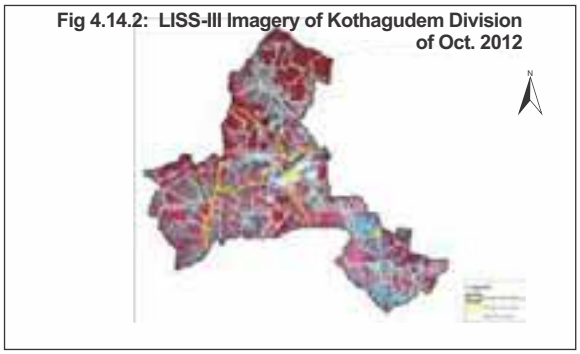


Fig 4.14.2: LISS-III Imagery of Kothagudem Division of Oct. 2012

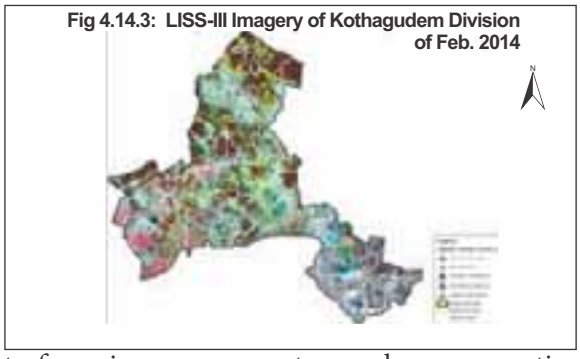


Fig 4.14.3: LISS-III Imagery of Kothagudem Division of Feb. 2014

Comparison of the current forest cover with that of previous assessment year shows a negative change of **337.45 Ha**. However, including the scrub, the total positive change comes to **287.75 Ha** and the total negative change comes to **379.14 Ha**. The forest cover change matrix given in Table 4.14.2 reveals the changes from one class to another class.

Out of the total positive including scrub, **285.11 Ha** is on account of growth in plantations raised, **2.64 Ha** is improvement of forest due to protection and management interventions. Out of the total negative change including scrub, **85.40 Ha** is on account of carrying advance operations for raising of plantations, **6.68 Ha** is on account of harvesting of plantations and **287.06 Ha** is on account of encroachments. As advance operations and harvesting of plantations, etc. are forest management interventions; the same area not considered as loss of forest cover. Hence the negative change on account of encroachments alone is taken as loss of forest cover. Therefore the **net loss of forest in the Division 287.06 Ha** only.

There are 76 Beats in the Division. Negative changes in forest cover are noticed in 15 Beats and positive change in 8 Beat. There are no changes in the remaining 53 Beats.

Details of forest cover in all Beats of the Division are shown in Table 4.14.3.

Table 4.14.2. Forest Cover Change Matrix: (Area in Km²)

2012	2013						Total of 2012
	VDF	MDF	OF	Scrub	NF	WATER	
Very Dense Forest	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Moderately Dense Forest	0.00	315.77	0.00	0.72	1.43	0.00	317.92
Open Forest	0.00	0.00	476.80	0.24	0.99	0.00	478.03
Scrub	0.00	0.00	0.00	200.90	0.42	0.00	201.32
Non-Forest	0.00	0.00	0.00	2.88	680.70	0.00	683.58
Water	0.00	0.00	0.00	0.00	0.00	3.04	3.04
Total of 2013	**0.00**	**315.77**	**476.80**	**204.74**	**683.54**	**3.04**	**1683.88**
Net Change	0.00	-2.15	-1.23	3.42	-0.04	0.00	0.00

Table 4.14.3. Beat Wise Forest Cover: Area in Ha

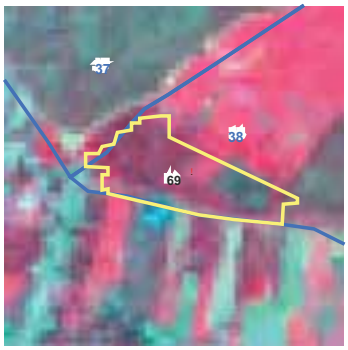
Beat	VDF	MDF	OF	SF	NF	WB	Total	Net Change	Encr.
BAYYARAM RANGE									
Bayyaram	0.00	217.42	967.53	448.16	801.08	1.51	2,435.70	0.00	0.00
Gowararam	0.00	18.10	33.71	14.09	749.18	0.00	815.08	0.00	0.00
Kachanpalli	0.00	494.43	295.42	30.11	549.31	0.00	1,369.27	0.00	0.00
Karukonda	0.00	170.56	330.94	293.00	1,983.99	1.06	2,779.55	0.00	0.00
Laxmipuram	0.00	339.54	539.62	99.91	980.56	1.30	1,960.93	0.00	0.00
Miryalapenta	0.00	331.17	387.57	53.36	1,097.46	0.10	1,869.65	0.00	0.00
Motlatimmapuram (n)	0.00	1,222.04	1,245.95	374.72	985.78	38.21	3,866.70	0.00	0.00
Motlatimmapuram (s)	0.00	634.00	728.24	396.61	718.46	34.28	2,511.59	0.00	0.00
Nagaram	0.00	338.16	804.96	420.27	1,209.15	3.71	2,776.24	0.00	0.00
Namalapadu	0.00	454.73	352.77	118.44	305.80	7.08	1,238.82	0.00	0.00
Pandipampula	0.00	371.15	479.12	91.60	1,235.04	0.60	2,177.51	0.00	0.00
Total	**0.00**	**4,591.28**	**6,165.84**	**2,340.28**	**10,615.80**	**87.84**	**23,801.04**	**0.00**	**0.00**
GUNDAL RANGE									
Adiviramavaram	0.00	2,693.33	1,112.02	101.66	258.04	0.00	4,165.05	-139.46	132.78
Damaratogu East	0.00	796.60	807.52	123.00	146.26	0.94	1,874.33	0.00	0.00
Damaratogu North	0.00	1,238.42	907.06	90.78	425.21	0.00	2,661.48	-28.01	28.01
Damaratogu West	0.00	1,274.53	966.85	269.13	446.44	0.00	2,956.96	-34.86	34.86
Dongatogu	0.00	3,137.65	1,272.25	259.70	861.13	10.34	5,541.07	-17.96	17.96
Gundala	0.00	396.94	2,133.21	512.28	2,518.83	12.09	5,573.35	-11.98	11.98
Jinnelagudem	0.00	56.31	515.60	185.76	474.66	0.00	1,232.33	0.00	0.00
Kachanpalli	0.00	521.92	1,041.68	508.25	1,935.02	4.91	4,011.78	0.00	0.00
Karnigudem	0.00	2,283.70	868.64	342.07	1,350.31	1.69	4,846.41	-46.80	46.80
Kodavatancha	0.00	235.09	966.98	482.18	2,077.80	10.52	3,772.56	-4.64	4.64
Mamakannu	0.00	168.88	802.41	277.51	890.22	1.95	2,140.96	0.00	0.00
Narsapuram	0.00	73.08	1,188.24	656.14	796.18	0.00	2,713.65	0.00	0.00
Ravigudem	0.00	71.49	564.76	148.08	307.61	0.00	1,091.93	0.00	0.00
Sayanpalli	0.00	100.18	256.77	423.82	2,157.07	20.53	2,958.37	0.00	0.00
Suddarevu	0.00	2,706.52	338.11	93.80	381.75	0.00	3,520.18	0.00	0.00
Valasala	0.00	157.89	427.08	329.62	1,995.48	8.82	2,918.88	-4.20	4.20
Total	**0.00**	**15,912.54**	**14,169.17**	**4,803.76**	**17,022.03**	**71.79**	**51,979.29**	**-287.91**	**281.23**
KOMRARAM RANGE									
Anantharam	0.00	614.58	655.82	153.36	1,024.18	2.20	2,450.14	0.00	0.00
Chinaregulagudem	0.00	629.34	740.57	195.69	304.89	0.00	1,870.49	0.00	0.00
Komraram	0.00	19.37	123.45	100.76	928.13	0.00	1,171.70	0.00	0.00
Manikyaram	0.00	710.76	663.75	78.51	1,073.42	0.00	2,526.45	0.00	0.00
Mittapalli	0.00	66.72	487.98	267.33	2,369.77	16.41	3,208.21	0.00	0.00

Polaram	0.00	215.47	813.53	413.97	2,235.03	0.00	3,678.00	0.00	0.00
Shammunigudem	0.00	1,036.39	587.66	100.75	265.82	1.43	1,992.04	-2.29	2.29
Shatpalli	0.00	1,126.56	808.04	149.73	756.37	0.00	2,840.70	0.00	0.00
Vennelbail	0.00	462.30	1,071.22	100.47	718.79	0.54	2,353.33	0.00	0.00
Yedapalagudem	0.00	348.62	459.17	103.61	633.63	0.00	1,545.03	0.00	0.00
Yellapuram	0.00	504.18	981.11	234.86	721.91	0.00	2,442.06	0.00	0.00
Total	**0.00**	**5,734.28**	**7,392.31**	**1,899.05**	**11,031.94**	**20.58**	**26,078.15**	**-2.29**	**2.29**
KOTHAGUDEM RANGE									
Ansetpalli	0.00	92.24	378.51	216.33	1,541.54	0.00	2,228.62	-1.76	1.76
Bodu	0.00	55.60	234.57	267.54	1,782.88	0.00	2,340.58	0.00	0.00
Chatakonda	0.00	0.00	118.10	971.11	742.29	1.20	1,832.70	52.22	0.00
Hemachandrapuram	0.00	0.83	132.83	134.48	50.54	0.00	318.68	0.00	0.00
Kistaram	0.00	998.02	678.38	145.41	471.30	5.30	2,298.41	0.00	0.00
Koppurai	0.00	273.80	222.81	188.58	1,811.48	11.38	2,508.06	0.00	0.00
Koyagudem	0.00	9.66	169.44	185.32	1,477.78	0.03	1,842.22	0.00	0.00
Medlamadugu	0.00	42.45	597.58	233.83	1,088.62	0.00	1,962.48	0.00	0.00
Murlipad	0.00	262.07	712.16	259.37	787.71	3.61	2,024.92	0.00	0.00
Total	**0.00**	**1,734.67**	**3,244.37**	**2,601.96**	**9,754.15**	**21.51**	**17,356.67**	**50.46**	**1.76**
RAMAVARAM RANGE									
Abbugudem	0.00	3.75	372.86	119.21	397.48	0.00	893.30	0.00	0.00
Annaram	0.00	35.45	1,092.49	378.63	338.87	3.34	1,848.78	0.00	0.00
Chaparalapally_east	0.00	49.49	666.81	228.06	641.99	0.00	1,586.34	0.00	0.00
Chaparalapally_west	0.00	24.29	679.06	218.75	43.56	0.00	965.66	0.00	0.00
Damarachrla	0.00	0.50	224.31	229.75	590.83	49.32	1,094.72	0.00	0.00
Gareebpet	0.00	0.00	396.40	558.94	613.88	0.00	1,569.21	0.00	0.00
Kamalapuram	0.00	39.93	624.24	299.98	1,060.62	4.90	2,029.67	0.00	0.00
Marrigudem	0.00	14.24	561.39	186.05	735.39	0.00	1,497.07	-0.42	0.00
Musalivarre	0.00	171.41	1,055.91	358.95	281.88	0.00	1,868.14	38.61	1.78
Penagadapa	0.00	2.28	337.23	464.76	292.27	0.00	1,096.54	51.58	0.00
Penuballi	0.00	165.36	1,386.59	889.07	236.74	0.00	2,677.75	16.66	0.00
Ramavaram	0.00	0.00	121.87	543.94	667.27	4.41	1,337.49	67.85	0.00
Sandrukunta	0.00	44.27	792.64	305.10	37.61	0.00	1,179.62	0.00	0.00
Satyampet	0.00	484.37	1,748.97	265.23	142.48	0.00	2,641.05	0.00	0.00
Thippanpalli	0.00	0.00	198.49	667.39	951.48	0.00	1,817.36	-35.69	0.00
Total	**0.00**	**1,035.34**	**10,259.26**	**5,713.79**	**7,032.35**	**61.96**	**24,102.70**	**138.59**	**1.78**
YELLANDU RANGE									
Daniyalapadu	0.00	0.37	2.74	10.39	565.74	0.00	579.24	0.00	0.00
Dharmapur	0.00	460.86	1,122.61	242.89	888.05	1.72	2,716.13	0.00	0.00
Jodbouli	0.00	183.82	471.85	320.11	1,302.27	3.50	2,281.55	15.99	0.00

Kollapur	0.00	321.26	625.25	260.16	537.76	0.00	1,744.43	0.00	0.00
Kommugudem	0.00	251.66	540.40	462.38	1,252.22	2.55	2,509.21	-13.06	0.00
Kunterla	0.00	209.43	573.52	410.40	453.74	18.09	1,665.18	6.83	0.00
Madharam	0.00	2.86	6.30	14.66	1,002.66	0.00	1,026.48	0.00	0.00
Patharalagadda	0.00	184.87	850.88	324.36	1,332.29	1.98	2,694.38	0.00	0.00
Perepalli	0.00	0.77	91.34	99.46	787.00	0.04	978.61	0.00	0.00
Pubally	0.00	162.25	440.31	223.84	1,127.17	4.78	1,958.34	0.00	0.00
Pusapalli	0.00	352.73	418.56	192.86	1,409.77	3.75	2,377.68	0.00	0.00
Thummalachelka	0.00	374.56	1,108.00	313.57	1,256.29	4.86	3,057.29	0.00	0.00
Todtalagudem	0.00	63.62	164.25	172.85	601.02	0.00	1,001.74	0.00	0.00
Urugutta	0.00	0.00	33.94	66.66	378.96	0.00	479.57	0.00	0.00
Total	**0.00**	**2,569.05**	**6,449.96**	**3,114.59**	**12,894.96**	**41.27**	**25,069.83**	**9.76**	**0.00**
Division Total	**0.00**	**31577.17**	**47680.91**	**20473.43**	**68351.22**	**304.96**	**168387.68**	**-91.39**	**287.06**

Satellite Imageries

2012



2013



Longitude	80.71942° E
Latitude	17.38069° N
Area in Ha	12.32
Change	SF TO NF
Comp No.	38
Beat	Marrigudem
Range	Ramavaram
Division	**Kothagudem**



4.15 PALONCHA DIVISION

4.15.1. Introduction

Paloncha Forest Division lies in the central part of Khammam district between latitudes 17^0 19' 4" and 18^0 09' 10" N and longitudes 80^0 25' 56" and 81^0 19' 36" E. Geographical Area of the Division is **1802.61 Km^2** which is **13.68%** of the geographical area of the District. The elevation varies from 12 to 600 m above MSL in this Division. Godavari River forms the north-eastern boundary of the Division. Other rivers in the Division are Kinnerasani, Pamleru and Morredu which almost dry up in summer. Besides these rivers few big tanks like Tummalachervu, Parentalacheruvu also exist in this Division.

Land use pattern of the Division is given in Table 4.15.1.

The climate of this Division is generally cool, fresh and pleasant with the maximum temperature of 48^0 C and the minimum of 12^{0}C. The annual rainfall is ranging from 934.96 to 1334 mm, received mainly from south-west monsoons.

The soil types found in this Division mainly are red sandy loam, red loam, black-cotton, alluvial and saline. The rock formations found in this Division are Quartzite, Gneiss, Sandstone, Granite, Schist and Marble. The important mineral deposit in this Division is coal. The other minerals are Barytes, Graphite, Hematite and soapstone.

Population of the Division is 0.29 million (2011 Census), per capita forest area is **0.36 Ha** and the population density is 275 persons per Km^2.

Table 4.15.1: Land use pattern (for entire Geographical area)

Land use	Area in Km^2	Percentage
Forest including Scrub	913.82	50.69%
Agriculture	622.23	34.52%
Land with Scrub	129.82	7.20%
Fallow Lands	36.14	2.00%
Grasslands	1.19	0.07%
Settlements	29.80	1.65%
Vegetation outside Forest	27.68	1.54%
Water Bodies	41.93	2.33%
Total	**1802.61**	**100.00%**

Source: AS per LULC map prepared by NRSC, Hyderabad in 2007

4.15.2. Recorded Forest Area:

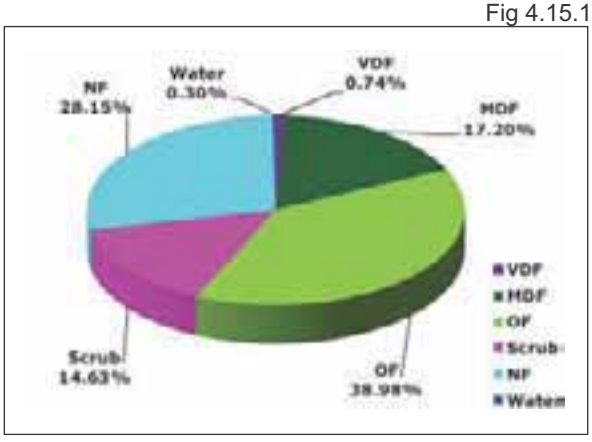
The notified forest area of the Division is **1047.17 Km^2** which is **58.09%** of the geographical area.

As per Champion and Seth's classification the forests of Division fall under Tropical dry deciduous, Tropical moist deciduous, Tropical Semi-evergreen, Dry Teak and Tropical Thorn Forest types.

4.15.3. Protected Area:

No Protected Area in this Division.

Fig 4.15.1



4.15.4. Community Forest Management:

There are 85 Vana Samrakshana Samithies (VSSs) in the Division. An area of **184.73 Km^2** of forests, which is **17.64%** of notified forests, is under the management of VSSs.

4.15.5. Forest Cover:

The forest cover in the Division based on the interpretation of IRS R2 LISS-III 2013 data (Feb 2014) and LISS-IV data (2011-2014)is **596.03 Km^2**which is

33.06% of the geographical area. In terms of the forest canopy density classes the Division has **7.75 Km²** of Very Dense Forests, **180.10 Km²** of Moderately Dense Forests and **408.17** Km² of Open Forests. The area of the Scrub is **153.18 Km²**, Non-Forest **294.81 Km²** and Water Bodies **3.15 Km²**. The distribution of the forest cover of the Division is shown in Fig 4.15.1.

4.15.6. Change in Forest Cover

The satellite images of 2012 and 2013 are shown in Figs 4.15.2 & 4.15.3 respectively and the changes during this period are shown on the image of 2013.

Fig 4.15.2: LISS-III Imagery of Palvoncha Division of Nov. 2012

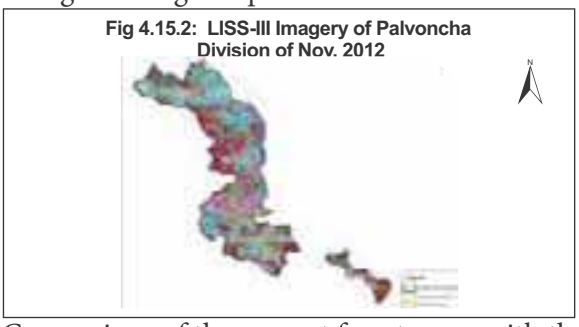
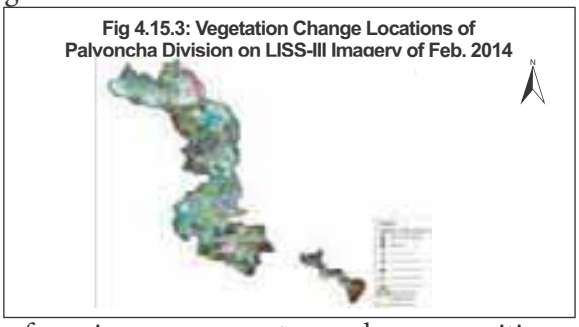


Fig 4.15.3: Vegetation Change Locations of Palvoncha Division on LISS-III Imagery of Feb. 2014



Comparison of the current forest cover with that of previous assessment year shows a positive change of **699.24 Ha** and negative change of **1088.93 Ha.** However, including the scrub, the total positive change is **955.66 Ha** and the total negative change is **1296.78 Ha.** The forest cover change matrix given in Table 4.15.2 reveals the changes from one class to the other.

Out of the total positive including scrub, **729.52 Ha** is on account of growth in plantations raised, **54.72 Ha** is improvement of forest due to protection and management interventions and **171.42 Ha** is on account of evacuation of encroached land and consequent improvement in the greenness. Out of the total negative change including scrub, **301.57 Ha** is on account of carrying advance operations for raising of plantation, **408.44 Ha** is on account of harvesting of plantations, **26.83 Ha** is an account of diversion of forest lands for non-forestry purpose and **559.94 Ha** is on account of encroachments. As advance operations and harvesting of plantations, diversion of forest lands etc. are forest management interventions; the same are not considered as loss of forest cover. Hence the negative change on account of encroachments alone is taken as loss of forest cover. Therefore the **net loss of forest in the Division 559.94 Ha** only.

There are 65 Beats in the Division. Negative changes in forest Cover are noticed in 15 and Positive changes in 11 Beats. There are no changes in the remaining 39 Beats.

Details of forest cover in all Beats of the Division are shown in Table 4.15.3.

Table 4.15.2. Forest Cover Change Matrix: (Area in Km²)

2012	2013						Total of 2012
	VDF	MDF	OF	Scrub	NF	WATER	
Very Dense Forest	7.75	0.00	0.00	0.00	0.00	0.00	7.75
Moderately Dense Forest	0.00	180.10	0.00	0.00	0.35	0.00	180.45
Open Forest	0.00	0.00	401.18	2.83	7.71	0.00	411.72
Scrub	0.00	0.00	1.46	147.79	2.08	0.00	151.33
Non-Forest	0.00	0.00	5.53	2.56	284.67	0.00	292.76
Water	0.00	0.00	0.00	0.00	0.00	3.15	3.15
Total of 2013	**7.75**	**180.10**	**408.17**	**153.18**	**294.81**	**3.15**	**1047.17**
Net Change	0.00	-0.35	-3.55	1.85	2.05	0.00	0.00



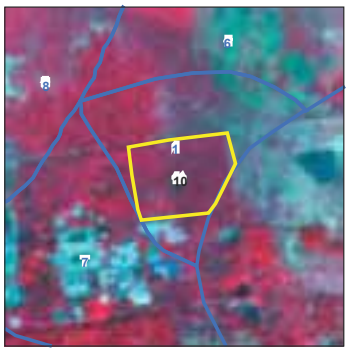
Table 4.15.3. Beat Wise Forest Cover: Area in Ha

Beat	VDF	MDF	OF	SF	NF	WB	Total	Net Change	Encr.
AMARARAM RANGE									
Amararam	0.01	42.77	28.52	0.50	0.15	0.00	71.95	0.00	0.00
Damaracherla	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Gundalapadu	3.91	841.51	1,045.53	124.74	227.18	0.00	2,242.87	0.00	0.00
Kothur	0.00	411.07	749.45	84.92	199.50	0.00	1,444.94	0.00	0.00
Raigudem	0.00	58.20	272.97	58.39	154.62	0.00	544.18	0.00	0.00
Sridhara	0.00	9.83	606.89	159.76	332.29	0.00	1,108.77	47.02	0.00
Timmampet	2.38	77.67	1,035.39	475.01	932.60	0.00	2,523.05	-18.39	18.39
Timmampet Baroon	0.00	102.54	351.61	85.31	341.14	0.00	880.60	0.00	0.00
Total	**6.30**	**1,543.59**	**4,090.36**	**988.63**	**2,187.48**	**0.00**	**8,816.36**	**28.63**	**18.39**
ASWAPURAM RANGE									
Aswapuram	6.68	694.38	1,359.73	305.34	424.49	0.00	2,790.62	0.00	0.00
Chintriyala	0.00	0.57	46.21	334.88	392.83	0.00	774.49	0.00	0.00
Eravendi	0.00	207.98	277.85	115.22	251.03	0.00	852.08	0.00	0.00
Gondigudem	1.66	683.57	752.01	118.56	915.68	0.00	2,471.48	0.00	0.00
Kistasagar	0.00	384.50	652.58	162.35	920.95	0.00	2,120.38	0.00	0.00
Kunavaram	0.00	476.47	2,110.70	603.10	451.94	37.20	3,679.41	0.00	0.00
Manubothulapadu	0.00	1,138.98	3,684.47	558.16	646.83	0.00	6,028.44	0.00	0.00
Manuguru South	0.00	667.47	839.55	687.57	1,502.74	12.90	3,710.23	-26.83	0.00
Manuguru West	0.00	54.03	1,168.39	1,547.11	2,127.81	13.84	4,911.18	0.00	0.00
Musalimadugu	0.00	202.05	880.75	144.13	433.92	0.00	1,660.85	0.00	0.00
Nellipaka	0.00	174.06	637.30	259.91	1,364.06	0.00	2,435.33	0.00	0.00
Sarapaka	0.00	162.41	465.01	389.14	1,352.45	0.00	2,369.01	44.25	0.00
Sompalli	0.00	0.00	1.41	8.39	264.26	0.00	274.06	0.00	0.00
Ulavanoor Kothur	0.00	908.54	1,756.62	206.88	131.48	0.00	3,003.52	0.00	0.00
Total	**8.34**	**5,755.01**	**14,632.58**	**5,440.74**	**11,180.47**	**63.94**	**37,081.08**	**17.42**	**0.00**
BAYYARAM RANGE									
Anantharam	0.00	23.23	197.66	169.30	1,077.91	0.76	1,468.86	-121.73	121.73
Chirumalla	0.00	913.13	2,540.30	1,012.67	578.39	10.34	5,054.83	0.00	0.00
Dugnepally	0.00	104.11	102.01	29.83	325.34	0.00	561.29	0.00	0.00
Gopalraopet	4.74	477.26	771.38	170.65	312.81	0.00	1,736.84	65.33	0.00
Janampet	0.00	471.69	568.08	310.25	955.65	11.52	2,317.19	-119.99	112.71
Kalvalnagaram	1.41	135.18	494.6a6	326.61	1,472.18	7.52	2,437.56	-64.96	86.82
Karakagudem	2.75	501.16	489.53	147.96	1,051.98	0.00	2,193.38	0.00	0.00
Kondaigudem	0.00	145.32	1,408.42	457.41	355.67	33.71	2,400.53	-11.21	0.00
Pagaderu	15.32	1,394.36	909.21	105.54	94.07	0.00	2,518.50	0.00	0.00
Pathareddipalem	0.00	153.01	449.98	213.57	143.17	2.61	962.34	0.00	0.00
Potlapally	3.53	261.79	394.72	106.68	77.60	0.00	844.32	0.00	0.00

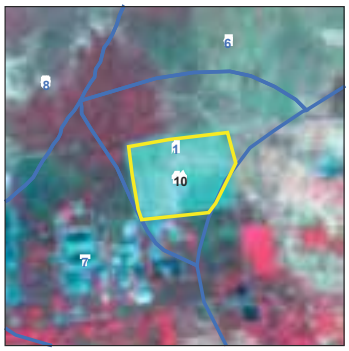
Raghunathapalem	0.00	231.75	2,125.55	1,174.94	743.68	7.64	4,283.56	0.00	0.00
Seethampet	0.00	852.65	1,054.93	223.21	602.06	0.00	2,732.85	94.58	0.00
Total	**27.75**	**5,664.64**	**11,506.43**	**4,448.62**	**7,790.51**	**74.10**	**29,512.05**	**-157.98**	**321.26**
KUKUNOOR RANGE									
Gummadapally	10.82	1,151.92	562.17	204.03	266.88	2.36	2,198.18	0.00	0.00
Gundambore	0.00	62.43	274.55	76.65	193.69	0.00	607.32	0.00	0.00
Kantlam	348.61	1,270.24	218.13	39.83	190.00	0.00	2,066.81	0.00	0.00
Kavadigundla East	367.59	921.28	131.98	16.69	40.35	0.00	1,477.89	0.00	0.00
Kavadigundla North	5.63	414.43	112.82	51.92	242.57	0.33	827.70	0.00	0.00
Kukunoor	0.00	197.63	474.99	27.75	182.75	0.00	883.12	-5.14	5.14
Lankalapally	0.00	0.00	0.88	3.94	2.14	0.00	6.96	0.00	0.00
Nandipadu	0.00	106.05	203.22	50.12	144.75	0.00	504.14	0.00	0.00
Total	**732.65**	**4,123.98**	**1,978.74**	**470.93**	**1,263.13**	**2.69**	**8,572.12**	**-5.14**	**5.14**
PALONCHA RANGE									
Bangarujal	0.00	0.00	20.55	172.04	213.79	2.72	409.10	0.00	0.00
Dantalaboru	0.00	0.00	520.55	324.41	325.46	0.00	1,170.42	-4.22	0.00
Lingareddipalli	0.00	104.05	1,422.38	277.12	362.45	0.00	2,166.00	-119.87	0.00
Madharam	0.00	120.74	1,986.26	363.32	384.19	0.00	2,854.51	152.17	66.14
Mulakalapally	0.00	18.70	1,174.93	492.65	733.41	1.15	2,420.84	-120.51	116.73
Muthyalampadu	0.00	863.46	1,268.98	423.97	860.54	14.65	3,431.60	15.64	0.00
Nagaram	0.00	0.00	3.82	78.13	193.39	0.00	275.34	0.00	0.00
Paloncha East	0.00	84.36	1,027.07	705.34	333.47	2.73	2,152.97	0.00	0.00
Pogadlapally	0.00	11.48	203.52	150.78	395.34	0.12	761.24	0.00	0.00
Suraram	0.00	0.00	61.85	272.54	460.88	150.93	946.20	-32.28	32.28
Uppusaka	0.00	38.50	352.08	250.91	2,083.81	1.46	2,726.76	0.00	0.00
Vaddu Ramavaram	0.00	9.54	568.36	458.12	383.91	1.27	1,421.20	-114.98	0.00
Total	**0.00**	**1,250.83**	**8,610.35**	**3,969.33**	**6,730.64**	**175.03**	**20,736.18**	**-224.05**	**215.15**
Division Total	**775.04**	**18,338.05**	**40,818.46**	**15,318.25**	**29,152.23**	**315.76**	**104,717.79**	**-341.12**	**559.94**

Satellite Imageries

2012



2013



Longitude	80.85942° E
Latitude	17.88213° N
Area in Ha	26.83
Change	OF TO NF
Comp No.	1
Beat	Manuguru South
Range	Ashwapuram
Division	**Paloncha**

4.16 PALONCHA WLM DIVISION

4.16.1. Introduction

Paloncha WLM Forest Division lies in the central part of Khammam district between latitudes 17^0 35' 11" N & 17^0 59' 54" N and longitudes 80^0 27' 14" E & 80^0 47' 20" E. Geographical Area of the Division is **824.24 Km^2** which is **6.25 %** of the geographical area of district. The elevation varies from 12 to 600 m above Mean Sea Level in this Division. Kinnerasani, Pamleru and Morredu are the important rivers of the district.

Land use pattern of the Division is given in Table 4.16.1.

The climate of this Division is generally cool, fresh and pleasant ranging from 10^0 C to 49^{0}C and the annual rainfall is about 1334 mm, received mainly from southwest monsoons.

The soil types found mainly in this Division are red Sandy loam, red loam, black-cotton, alluvium and saline. The rock formations found in this Division are Quartzite, Gneiss, Sandstone, Granite, Schist and Marble. The minerals found in this Division are Barytes, Graphite, Hematite (Iron ore) and soap stone.

4.16.2. Recorded Forest Area:

The notified forest area of the Division is **686.38 Km^2**, which is **83.27%** of the geographical area. As per Champion and Seth's classification the forests of Division fall under Tropical dry deciduous, Tropical moist deciduous, Tropical Semi-evergreen, Dry Teak and Tropical Thorn Forest types.

Table 4.16.1: Land use pattern (for entire Geographical area)

Land use	Area in Km^2	Percentage
Forest including Scrub	622.00	75.46%
Agriculture	137.65	16.70%
Land with Scrub	19.31	2.43%
Fallow Lands	4.29	0.52%
Grasslands	0.12	0.01%
Settlements	0.38	0.05%
Vegetation outside Forest	17.29	2.10%
Water Bodies	23.20	2.81%
Total	**824.24**	**100.00%**

Source: AS per LULC map prepared by NRSC, Hyderabad in 2007

4.16.3. Protected Area:

Entire forest area of the Division is included in **Kinnersani WLS**.

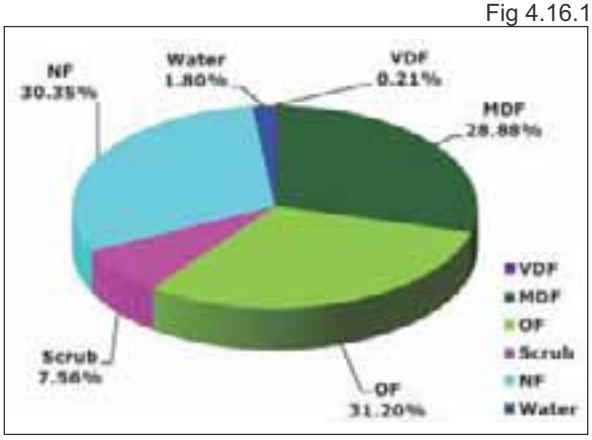
4.16.4. Community Forest Management:

There are 50 Vana Samrakshana Samities (VSSs) in the Division. **199.33 Km^2** of notified forests, which constitutes **29.04%** of forest area, is under the management of VSSs.

4.16.5. Forest Cover:

The forest cover in the Division based on the interpretation of IRS R2 LISS-III 2013 data (Feb 2014) and LISS-IV data (2011-2014) is **413.79 Km^2** which is 50.20% of the geographical area. In terms of the forest canopy density classes the Division has **1.41 Km^2** of Very Dense Forests, **198.22 Km^2** of Moderately Dense Forests and **214.17 Km^2** of Open Forest. The area of the Scrub is **51.91 Km^2**, Non-Forest **208.34 Km^2** and Water Bodies **12.34 Km^2**. The distribution of the forest cover of the Division is shown in Fig 4.16.1.

Fig 4.16.1



4.16.6. Change in Forest Cover

The Satellite images of 2012 and 2013 are shown in Figs 4.16.2 & 4.16.3 respectively and the changes during this period are shown on the image of 2013.

Fig 4.16.2: LISS-III Imagery of Wild Life Paloncha Division of Nov. 2012

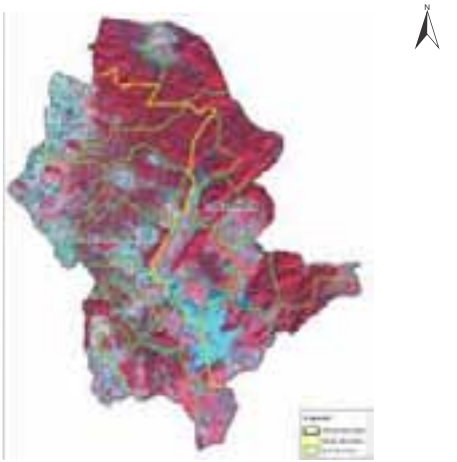
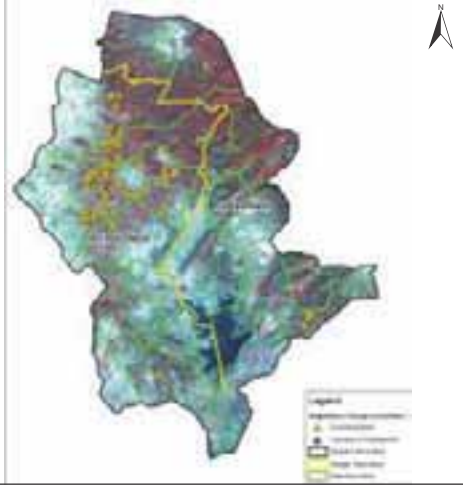


Fig 4.16.3: Vegetation Change Locations of Wild Life Paloncha Division on LISS-III Imagery of Feb. 2014



Comparison of the current forest cover with that of previous assessment year shows a negative change of **398.35 Ha** (including the scrub). The forest cover change matrix given in Table 4.16.2 reveals the changes from one class to another class.

Out of the total negative change including scrub, **3.51 Ha** is on account of harvesting of plantations, and **394.84 Ha** is on account of encroachments. As harvesting of plantations etc. are forest management interventions; the same are not considered as loss of forest cover. Hence the negative change on account of encroachments alone is taken as loss of forest cover. Therefore, the **net loss of forest in the Division 394.84 Ha** only.

There are 20 Beats in the Division. Negative changes in forest cover are noticed in 11 Beats. There are no changes in the remaining 9 Beats.

Details of forest cover in all Beats of the Division are shown in Table 4.16.3.

Table 4.16.2. Forest Cover Change Matrix: (Area in Km^2)

2012	2013						Total of 2012
	VDF	MDF	OF	Scrub	NF	WATER	
Very Dense Forest	1.41	0.00	0.00	0.00	0.00	0.00	1.41
Moderately Dense Forest	0.00	198.22	0.00	0.00	2.84	0.00	201.06
Open Forest	0.00	0.00	214.17	0.00	1.15	0.00	215.32
Scrub	0.00	0.00	0.00	51.91	0.00	0.00	51.91
Non-Forest	0.00	0.00	0.00	0.00	204.35	0.00	204.35
Water	0.00	0.00	0.00	0.00	0.00	12.34	12.34
Total of 2013	**1.41**	**198.22**	**214.17**	**51.91**	**208.34**	**12.34**	**686.38**
Net Change	0.00	-2.84	-1.15	0.00	3.99	0.00	0.00

Table 4.16.3. Beat Wise Forest Cover: Area in Ha

Beat	VDF	MDF	OF	SF	NF	WB	Total	Net Change	Encr.
CHATAKONDA RANGE									
Allapally	0.00	682.24	952.44	608.01	2,607.34	11.46	4,861.49	-94.31	94.31
Chinthakunta	0.00	429.10	2,140.46	915.57	1,564.88	9.97	5,059.98	-23.73	23.73
Gangaram	0.67	370.91	696.99	207.43	652.87	0.00	1,928.87	-5.71	2.20
Gattumalla	2.74	750.14	1,369.03	399.30	1,666.42	0.02	4,187.66	-8.44	8.44
Gollagudem	0.00	140.67	495.66	306.27	1,324.69	79.83	2,347.12	0.00	0.00
Kothasingaram	2.45	2,223.24	1,296.02	156.05	173.41	0.00	3,851.17	-54.45	54.45
Mailaram	0.00	158.06	644.36	256.44	1,212.62	360.29	2,631.76	0.00	0.00
Markode	15.48	2,869.13	1,128.89	258.74	1,251.49	0.90	5,524.63	-56.79	56.79
Punukula Chelaka	0.00	101.59	529.98	205.33	585.98	0.00	1,422.88	0.00	0.00
Regalla	0.00	0.00	52.48	101.41	1,426.95	0.00	1,580.83	0.00	0.00
Venkatapuram	0.00	968.60	1,779.00	395.81	1,167.30	0.60	4,311.30	-109.40	109.40
Total	**21.34**	**8,693.67**	**11,085.30**	**3,810.37**	**13,633.95**	**463.07**	**37,707.69**	**-352.83**	**349.32**
YANAMBAIL RANGE									
Bangaru Chelaka	0.00	236.54	1,356.44	372.62	2,202.95	247.41	4,415.97	0.00	0.00
Karegattu	2.92	1,227.52	1,301.14	208.59	1,191.19	14.99	3,946.35	-18.39	18.39
Mallaram	1.05	712.93	1,274.81	151.77	1,223.25	0.95	3,364.76	-10.96	10.96
Mamillavai	2.17	1,254.77	894.78	73.40	411.55	0.00	2,636.67	0.00	0.00
Pagidapur	20.37	2,467.83	999.87	90.74	135.60	0.00	3,714.42	-4.32	4.32
Regalla	33.68	1,890.58	1,362.27	136.43	338.10	0.00	3,761.05	0.00	0.00
Regulagudem	8.58	919.26	808.18	91.14	120.03	0.00	1,947.19	-11.85	11.85
Ulvachelaka	50.94	2,153.51	1,759.49	138.92	50.55	0.00	4,153.41	0.00	0.00
Yanambail	0.00	265.54	574.74	117.34	1,524.73	508.14	2,990.49	0.00	0.00
Total	**119.71**	**11128.49**	**10331.72**	**1380.95**	**7197.95**	**771.49**	**30930.31**	**-45.52**	**45.52**
Division Total	**141.04**	**19822.16**	**21417.02**	**5191.32**	**20831.91**	**1234.56**	**68638.00**	**-398.35**	**394.84**



4.17 KAMAREDDY DIVISION

4.17.1. Introduction

Kamareddy Forest Division lies in the south-eastern part of Nizamabad district between latitudes 18° 3' 34" N & 18° 42' 11" N and longitudes 77° 53' 45" E & 78° 34' 17" E. Geographical area of the Division is **3216.52 Km²** which is **40.37%** of the geographical area of district. This Division lies on the Deccan plateau. Manjira River flowing from Medak District enters Kamareddy Division at Nizam sagar reservoir and flows in northern direction to join river Godavari at the north-western corner of the district. Kappalavagu and Peddavagu are other two important streams of the Division. The rivers and streams of the district form part of Godavari basin. The altitude varies from 335 to 490 m above MSL. The highest peak is 635 m above MSL situated in Gandhari block.

Land use pattern of the Division is given in Table 4.17.1.

The climate of this Division is generally dry with temperatures ranging from 13°C to 47°C. The north and north-western regions of the Division receive above 1000 mm of rainfall while north-eastern, south-eastern and southern regions receive less than 900 mm of rainfall from south-west monsoons.

The soil types found mainly are black cotton and sandy loams. The economic minerals known from this Division are the building material-clay, iron-ore, manganese ore, mica, semi-precious stones, talc and soap-stones.

Population of the Division is 1.01 million (2011 Census), per capita forest area is **0.1Ha** and the population density is 371 persons per Km².

Table 4.17.1: Land use pattern (for entire Geographical area)

Land use	Area in Km²	Percentage
Forest including Scrub	903.57	28.09%
Agriculture	1662.58	51.69%
Land with Scrub	284.61	8.85%
Fallow Lands	72.45	2.25%
Grasslands	50	1.55%
Settlements	53.00	1.65%
Vegetation outside Forest	82.42	2.56%
Water Bodies	107.89	3.35%
Total	**3216.52**	**100.00%**

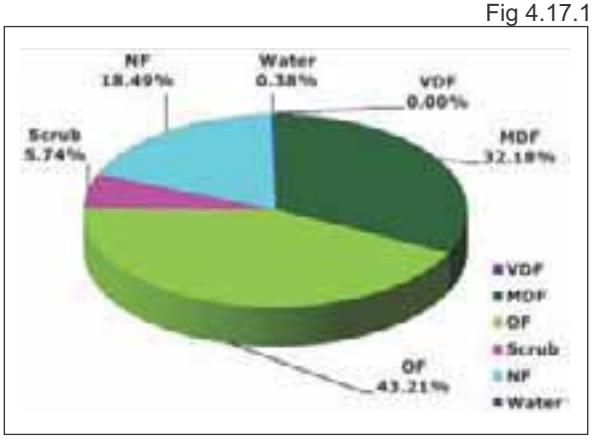
Source: AS per LULC map prepared by NRSC, Hyderabad in 2007

4.17.2. Recorded Forest Area:

The notified forest area of the Division is **940 Km²** which is **29.22%** of the geographical area. Reserved, Protected and un-classed forests constitute **598.56 Km²** (63.71%), **252 Km²** (26.84%) and **88.84 Km²** (9.45%) of the forest area respectively.

As per Champion and Seth's classification the Forests of Division fall under Tropical dry deciduous type.

Fig 4.17.1



4.17.3. Protected Area:

One PA, viz., Pocharam WLS is situated in this Division. An area of **86.76 Km²** is included in the PA.

4.17.4. Community Forest Management:

There are 112 Vana Samrakshana Samities (VSSs) in the Division. An area of **325.66 Km²**, which is **33.19%** of the notified forest area, is under the management of the VSSs.

4.17.5. Forest Cover:

The forest cover in the Division based on the interpretation of IRS R2 LISS-III 2013 data (Dec 2013)

and LISS-IV data (2011-2014) is **739.83 Km²** which is **23.00%** of the geographical area. In terms of the forest canopy density classes the Division has **315.83 Km²** of Moderately Dense Forests and **424.00 Km²** of Open Forests. The area of the Scrub is **56.30 Km²**, Non-Forest **181.46 Km²** and Water Bodies **3.70 Km²**. The distribution of the forest cover of the Division is shown in Fig 4.17.1.

4.17.6. Change in Forest Cover

The Satellite images of 2012 and 2013 are shown in Figs 4.17.2 & Fig 4.17.3 respectively and the changes between this period are shown on the image of 2013.

Fig 4.17.2: LISS-III Imagery of Kamareddy Division of Oct. 2012



Fig 4.17.3: Vegetation Change Locations of Kamareddy Division on LISS-III Imagery of Dec.2013



Comparison of the current forest cover with that of previous assessment year shows a negative change of **32.57 Ha**. However, including the scrub, the total negative change is **43.76 Ha**. The forest cover change matrix given in Table 4.17.2 reveals the changes from one class to another class.

Out of the total negative change (including scrub) of, **12.77 Ha** is on account of advance operation for raising of plantations, and **30.99 Ha** is on account of encroachments. As advance operation, for raising of plantations are Forest management interventions and hence not considered as loss of forest Cover. Thus, only the negative change due to encroachments is taken as loss of forest cover. Therefore, the **net loss of forest is 30.99 Ha** only.

There are 66 Beats in the Division. Negative changes in forest cover are noticed in 11 Beats. There are no changes in the remaining 55 Beats.

Details of forest cover in all Beats of the Division are shown in Table 4.17.3.

Table 4.17.2. Forest Cover Change Matrix: (Area in Km²)

2012	2013						Total of 2012
	VDF	MDF	OF	Scrub	NF	WATER	
Very Dense Forest	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Moderately Dense Forest	0.00	315.83	0.00	0.00	0.02	0.00	315.85
Open Forest	0.00	0.00	424.00	0.00	0.31	0.00	424.31
Scrub	0.00	0.00	0.00	56.30	0.11	0.00	56.41
Non-Forest	0.00	0.00	0.00	0.00	181.02	0.00	181.02
Water	0.00	0.00	0.00	0.00	0.00	3.70	3.70
Total of 2013	**0.00**	**315.83**	**424.00**	**56.30**	**181.46**	**3.70**	**981.29**
Net Change	0.00	-0.02	-0.31	-0.11	0.44	0.00	0.00

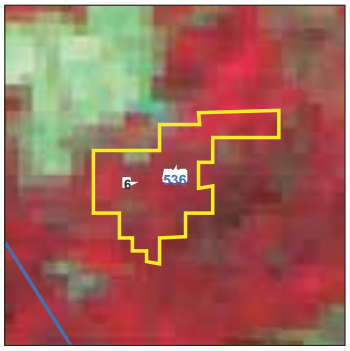
Table 4.17.3. Beat Wise Forest Cover: Area in Ha

Beat	VDF	MDF	OF	SF	NF	WB	Total	Net Change	Encr.
GANDHARI RANGE									
Bhanapur	0.00	109.38	890.12	68.77	174.51	0.00	1,242.78	0.00	0.00
Chedmal	0.00	351.18	664.68	44.40	1,315.30	0.00	2,375.56	0.00	0.00
Gandhari	0.00	33.31	101.44	11.90	814.47	7.26	968.38	0.00	0.00
Gandivate	0.00	706.63	1,083.17	25.83	813.48	19.37	2,648.48	0.00	0.00
Gowraram(g)	0.00	839.64	353.70	11.43	404.29	0.52	1,609.58	0.00	0.00
Gurjal	0.00	13.32	554.98	92.63	332.95	3.20	997.08	0.00	0.00
Kondapur	0.00	48.22	329.74	27.30	150.31	1.29	556.86	0.00	0.00
Mombajipet	0.00	270.36	493.13	40.70	349.34	38.26	1,191.79	0.00	0.00
Mudhelly	0.00	797.87	525.42	7.08	257.44	1.64	1,589.45	0.00	0.00
Nagloor	0.00	318.76	446.08	43.96	769.05	0.00	1,577.85	0.00	0.00
Pothangal	0.00	677.47	910.42	99.65	321.44	1.69	2,010.67	0.00	0.00
Singitham	0.00	936.30	834.50	15.71	195.00	36.52	2,018.03	0.00	0.00
Uthnoor	0.00	39.54	93.98	28.41	488.12	0.65	650.70	0.00	0.00
Vellutla	0.00	1,222.86	867.24	30.37	192.10	7.44	2,320.01	0.00	0.00
Yacharam	0.00	334.05	310.65	22.11	865.67	0.45	1,532.93	0.00	0.00
Total	**0.00**	**6,698.89**	**8,459.25**	**570.25**	**7,443.47**	**118.29**	**23,290.15**	**0.00**	**0.00**
INDALWAI RANGE									
Amsanpally	0.00	389.39	1,045.51	159.66	323.46	2.31	1,920.33	-1.57	1.57
Dharpally	0.00	189.92	494.51	79.51	62.51	0.00	826.45	0.00	0.00
Dubbak	0.00	263.06	1,035.57	267.67	458.43	1.04	2,025.77	-3.07	3.07
Gannaram	0.00	465.34	706.18	59.05	174.28	7.04	1,411.89	0.00	0.00
Gowraram	0.00	415.88	809.93	65.35	368.36	2.28	1,661.80	0.00	0.00
Indalwai	0.00	854.19	911.94	98.46	161.11	3.50	2,029.20	0.00	0.00
Kalwaral	0.00	642.97	305.91	23.60	32.93	1.59	1,007.00	0.00	0.00
Koratpally	0.00	113.36	922.96	200.38	238.47	15.81	1,490.98	0.00	0.00
Navanandi	0.00	780.35	279.04	19.17	81.38	0.00	1,159.94	0.00	0.00
Pipri	0.00	636.08	123.09	10.06	35.82	0.00	805.05	0.00	0.00
Ravutla	0.00	1,283.03	291.57	17.97	125.30	0.00	1,717.87	0.00	0.00
Sadasivnagar	0.00	533.47	346.52	18.03	72.45	0.00	970.47	0.00	0.00
Sirikonda	0.00	1,047.29	265.38	7.19	67.02	14.13	1,401.01	0.00	0.00
Sirnapally	0.00	707.97	475.64	35.05	171.83	21.56	1,412.05	0.00	0.00
Triyambakpet	0.00	454.00	466.08	6.28	93.10	0.00	1,019.46	0.00	0.00
Yanampally	0.00	293.95	741.98	57.28	73.10	0.00	1,166.31	-4.92	4.92
Total	**0.00**	**9,070.25**	**9,221.81**	**1,124.71**	**2,539.55**	**69.26**	**22,025.58**	**-9.56**	**9.56**
KAMAREDDY RANGE									
Akkapuram	0.00	75.40	298.54	38.59	309.82	2.58	724.93	0.00	0.00
Annaram	0.00	726.38	922.16	242.11	1,431.67	11.68	3,334.00	-4.44	4.44
Bhiknoor	0.00	545.16	756.42	137.46	129.49	0.00	1,568.53	0.00	0.00
Donkal	0.00	1,517.40	691.25	8.80	86.13	12.39	2,315.97	0.00	0.00
Esaipet	0.00	58.92	862.79	360.11	540.78	5.49	1,828.09	-11.29	0.00
Gadkole	0.00	468.79	910.08	50.87	170.30	11.87	1,611.91	-11.70	11.70
Ghanpur	0.00	323.62	803.80	185.45	517.94	0.09	1,830.90	-2.05	2.05

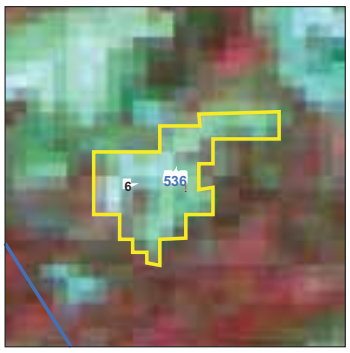
Ghanpur Beroon	0.00	29.67	621.75	474.45	481.81	17.00	1,624.68	0.00	0.00
Gidda	0.00	887.62	670.75	14.48	40.42	4.93	1,618.20	0.00	0.00
Honnajipet	0.00	528.72	670.22	41.02	79.08	0.00	1,319.04	0.00	0.00
Kotalpally	0.00	511.66	669.22	43.40	111.76	13.29	1,349.33	0.00	0.00
Machareddy	0.00	58.99	344.47	41.44	78.85	0.00	523.75	0.00	0.00
Maddikunta	0.00	474.38	846.01	144.20	214.80	0.00	1,679.39	0.00	0.00
Pakhal (north)	0.00	1,086.98	597.05	76.63	708.43	0.00	2,469.09	-1.66	1.66
Pakhal South	0.00	570.52	483.07	229.53	265.04	1.14	1,549.30	0.00	0.00
Pandimadugu	0.00	398.79	208.99	7.87	98.88	0.00	714.53	-1.58	1.58
Peddaipally	0.00	267.97	463.12	74.75	241.07	0.00	1,046.91	0.00	0.00
Posanipet Beroon	0.00	1.84	69.52	20.31	54.98	0.00	146.65	0.00	0.00
Reddypet	0.00	581.23	829.31	66.79	69.87	0.00	1,547.20	0.00	0.00
Toompally	0.00	2,147.90	848.16	108.71	335.55	3.05	3,443.37	0.00	0.00
Total	**0.00**	**11,261.94**	**12,566.68**	**2,366.97**	**5,966.67**	**83.51**	**32,245.77**	**-32.72**	**21.43**
YELLAREDDY RANGE									
Bhavanipet	0.00	712.04	615.17	14.93	156.13	34.34	1,532.61	0.00	0.00
Bollaram	0.00	101.57	1,055.67	218.99	270.35	5.46	1,652.04	0.00	0.00
Gundaram	0.00	350.79	1,065.29	122.69	407.58	1.20	1,947.55	0.00	0.00
Hasanpally	0.00	105.89	527.22	81.14	48.99	5.82	769.06	0.00	0.00
Jaldepally	0.00	226.24	505.20	4.29	73.89	4.77	814.39	0.00	0.00
Komatpally	0.00	136.05	739.35	104.74	69.94	0.00	1,050.08	0.00	0.00
Kondapur	0.00	412.30	2,066.06	281.38	224.82	0.00	2,984.56	0.00	0.00
Laxmapur	0.00	976.91	799.21	48.54	68.09	11.33	1,904.08	0.00	0.00
Mengaram	0.00	379.71	601.82	20.49	90.05	0.88	1,092.95	0.00	0.00
Mothe	0.00	96.11	957.09	114.96	241.66	28.47	1,438.29	-1.48	0.00
Mustapur	0.00	434.52	456.32	56.07	88.91	2.89	1,038.71	0.00	0.00
Nagireddypet	0.00	140.39	1,086.17	237.23	218.19	1.79	1,683.77	0.00	0.00
Potaipally	0.00	149.78	815.80	150.37	82.32	0.00	1,198.27	0.00	0.00
Shetpally	0.00	229.64	613.37	73.13	110.62	0.73	1,027.49	0.00	0.00
Yerrapahad	0.00	99.52	248.04	38.95	45.66	1.24	433.41	0.00	0.00
Total	**0.00**	**4,551.46**	**12,151.78**	**1,567.90**	**2,197.20**	**98.92**	**20,567.26**	**-1.48**	**0.00**
Division Total	**0.00**	**31,582.54**	**42,399.52**	**5,629.83**	**18,146.89**	**369.98**	**98,128.76**	**-43.76**	**30.99**

Satellite Imageries

2012



2013



Longitude	78.51094 ° E
Latitude	18.40597° N
Area in Ha	4.44
Change	OF TO NF
Comp No.	536
Beat	Annaram
Range	Kamareddy
Division	**Kamareddy**

4.18 MEDAK DIVISION

4.18.1. Introduction

Medak is located in the north-western part of Andhra Pradesh State between latitudes 17^0 25' 36" N & 18^0 17' 7" N and longitudes 77^0 26' 43" E & 79^0 7' 37" E. Geographical area of the Division is **9,619.75 Km^2**. Which is **99.06%** of the area of the District. District forms a part of the table land of Deccan plateau and is criss-crossed by different ranges of hills. The ground is mostly flat and undulating with gentle slope. The elevation of ground varies from 500 to 600 m above MSL with occasional hills up to 638M above MSL. Medak falls under semi-arid region of peninsular India.

Land use of the Division is given in Table 4.18.1.

The climate of this Division is generally dry with temperatures ranging from 6^{0}C to 46^{0}C and the annual rainfall is about 700 mm, received mainly from Southwest monsoons.

Red earths comprising loamy sands, sandy loams and sandy clay loams; regar or black cotton soil comprising clay loams, clay and silt clay are present.

Manjeera River, which is a tributary of Godavari River, is the main source of water supply. Haldivagu or Pasupuvagu- a tributary of Manjeera and Kudlair- a tributary of Manair River, are also water sources in the district and all these remains dry in the summer.

Population of the Division is 3.03 million (2011 Census), per capita forest area is **0.03 Ha** and the population density is 312 persons per Km^2.

Table 4.18.1: Land use pattern (for entire Geographical area)

Land use	Area in Km^2	Percentage
Forest including Scrub	923.13	9.60%
Agriculture	7591.99	78.92%
Land with Scrub	482.63	5.02%
Fallow Lands	11.42	0.12%
Settlements	50.71	0.53%
Vegetation outside forest	293.88	3.05%
Waterbody	265.99	2.77%
Total	**9619.75**	**100.00%**

Source: AS per LULC map prepared by NRSC, Hyderabad in 2007

4.18.2. Recorded Forest Area:

The notified forest area of the Division is **905.94 Km^2** which is 9.42% of the geographical area. Reserved, Protected and un-classed forests constitute **634.22 Km^2** (70%), **255.63 Km^2** (28.22%) and **16.09 Km^2** (1.78%) of the forest area respectively.

As per Champion and Seth's classification the forests of Division fall under Tropical Dry Deciduous and Tropical Thorn Forest types.

4.18.3. Protected Area:

A part of **Pocharam WLS** falls in this Division. An area of **55.47 Km^2** is included in Pocharam WLS.

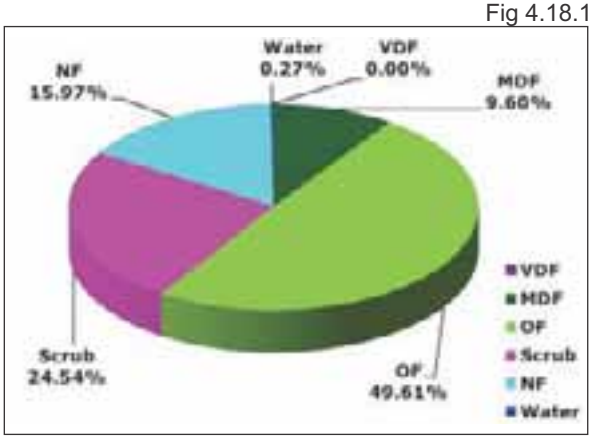
4.18.4. Community Forest Management:

There are 251 Vana Samrakshana Samities (VSSs) in the Division. An area of **678.04 Km^2** of forests, which is **75%** of notified forest area, is under the management of VSSs.

4.18.5. Forest Cover:

The forest cover in the Division based on the interpretation of IRS R2 LISS-III 2013 data (Dec 2013) is

Fig 4.18.1



542.73 Km² which is **5.64%** of the geographical area. In terms of the forest canopy density classes the Division has **88.00 Km²** of Moderately Dense Forests and **454.72 Km²** of Open Forests. The area of the Scrub is **224.97 Km²**, Non-Forests **146.37 Km²** and Water Bodies **2.51 Km²**.

The distribution of the forest cover of the division is shown in Fig 4.18.1.

4.18.6. Change in Forest Cover

The Satellite image of 2012 and 2013 are shown in Figs 4.18.2 & 4.18.3 respectively and the changes between this period are shown on the image of 2013.

Fig 4.18.2: LISS-III Imagery of Medak Division of Oct. 2012

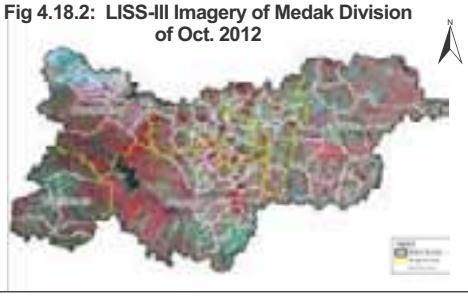
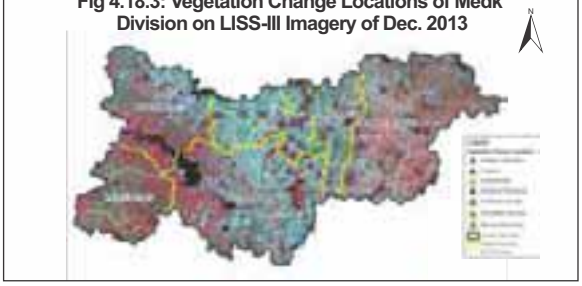


Fig 4.18.3: Vegetation Change Locations of Medk Division on LISS-III Imagery of Dec. 2013



Comparison of the current forest cover with that of previous assessment year shows a negative change of **127.70 Ha**. However, including the scrub, the total positive change is **19.89 Ha** and the total negative change is **373.66 Ha**. The forest cover change matrix given in Table 4.18.2 reveals the changes from one class to another class.

Out Of the total positive change including scrub of, **10.55 Ha** on account of growth in raised plantations, and **9.34 Ha** is improvement of forest due to protection and management interventions. Of the total negative change including scrub of, **349.68 Ha** is on account of clearance of jungle growth for raising of plantations, **19.12 Ha** is on account of harvesting of plantation, and **4.86 Ha** is on account of encroachments. As clearance of jungle growth for raising of plantations and harvesting of plantations are forest management interventions, the same are not considered as loss of forest cover. Thus, only the negative change due to encroachments is taken as loss of forest cover. Therefore, the **net loss of forest is 4.86 Ha** in the Division.

There are 92 Beats in the Division. Negative changes in forest cover are noticed in 23 Beats and positive changes in 2 Beat. There are no changes in remaining 67 Beats.

Details of forest cover in all Beats of the Division are shown in Table 4.18.3.

Table 4.18.2. Forest Cover Change Matrix: (Area in Km²)

2012	2013						Total of 2012
	VDF	MDF	OF	Scrub	NF	WATER	
Very Dense Forest	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Moderately Dense Forest	0.00	88.00	0.00	0.00	0.10	0.00	88.10
Open Forest	0.00	0.00	454.72	0.00	1.17	0.00	455.89
Scrub	0.00	0.00	0.00	224.77	2.46	0.00	227.23
Non-Forest	0.00	0.00	0.00	0.20	142.64	0.00	142.84
Water	0.00	0.00	0.00	0.00	0.00	2.51	2.51
Total of 2013	**0.00**	**88.00**	**454.72**	**224.97**	**146.37**	**2.51**	**916.58**
Net Change	0.00	-0.10	-1.17	-2.26	3.53	0.00	0.00

Table 4.18.3. Beat Wise Forest Cover: Area in Ha

Beat	VDF	MDF	OF	SF	NF	WB	Total	Net Change	Encr.
MEDAK RANGE									
Amsanpally	0.00	451.09	925.06	158.15	82.90	0.00	1,617.20	0.00	0.00
Andugulapally	0.00	19.95	473.40	71.65	25.56	0.00	590.56	-27.48	0.00
Annaram	0.00	113.60	730.83	217.60	157.99	1.52	1,221.54	0.00	0.00
Arkela	0.00	0.71	194.12	353.62	189.12	0.00	737.57	0.00	0.00
Bhootpur	0.00	234.36	808.10	159.06	132.57	7.91	1,342.00	0.00	0.00
Bujrampet	0.00	138.03	296.61	181.40	226.51	0.00	842.55	0.00	0.00
Damarancha	0.00	17.68	531.47	380.93	67.05	0.00	997.13	-17.68	0.00
Kulcharam	0.00	278.24	494.30	159.78	101.47	0.00	1,033.79	0.00	0.00
Manepally	0.00	246.26	767.98	35.64	57.29	0.00	1,107.17	0.00	0.00
Mangalparthy	0.00	175.66	899.53	179.90	240.80	0.00	1,495.89	0.00	0.00
Nagsanpally	0.00	86.87	711.47	319.32	62.25	1.28	1,181.19	0.00	0.00
Rampur	0.00	109.97	866.21	294.80	121.73	0.00	1,392.71	0.00	0.00
S.kondapur	0.00	133.16	803.68	161.48	180.14	1.60	1,280.06	-34.45	0.00
Shetpally	0.00	136.84	1,003.57	289.24	658.27	13.08	2,101.00	-21.03	0.00
Tekmal	0.00	9.09	614.30	169.25	95.67	0.00	888.31	0.00	0.00
Wariguntham	0.00	80.44	273.55	62.59	98.60	0.00	515.18	0.00	0.00
Yeldurthy	0.00	311.34	1,340.87	295.06	142.13	1.88	2,091.28	0.00	0.00
Total	**0.00**	**2543.29**	**11735.05**	**3489.47**	**2640.05**	**27.27**	**20435.13**	**-100.64**	**0.00**
NARAYANKHED RANGE									
Alladurgu	0.00	8.35	173.06	4.05	131.14	0.00	316.60	0.00	0.00
Bachepally	0.00	0.00	11.58	144.63	198.76	0.00	354.97	0.00	0.00
Bibipet	0.00	0.03	15.62	259.15	369.38	0.66	644.84	0.00	0.00
Kadpal	0.00	68.63	374.06	52.01	14.42	0.00	509.12	0.00	0.00
Madhwar	0.00	0.11	302.27	397.97	362.49	0.00	1,062.84	-6.71	0.00
Nagadhar	0.00	49.02	742.70	270.84	107.66	0.00	1,170.22	0.00	0.00
Narayanakhed	0.00	0.60	176.31	95.07	120.33	0.00	392.31	0.00	0.00
Nizampet	0.00	0.00	172.28	399.42	128.02	5.52	705.24	-13.97	0.00
Raikode	0.00	0.60	158.24	146.23	419.02	0.00	724.09	0.00	0.00
Raparthy	0.00	0.00	55.43	94.80	128.32	0.00	278.55	0.00	0.00
Sanjeevanraopet	0.00	16.45	305.18	39.46	95.96	0.00	457.05	0.00	0.00
Shankarampet_a	0.00	12.33	257.06	112.99	95.40	0.00	477.78	0.00	0.00
Tedkal	0.00	0.00	0.11	8.92	139.32	1.14	149.49	0.00	0.00
Total	**0.00**	**156.12**	**2743.90**	**2025.54**	**2310.22**	**7.32**	**7243.10**	**-20.68**	**0.00**
NARSAPUR RANGE									
Brahmanpally	0.00	46.24	361.35	47.03	14.20	0.00	468.82	0.00	0.00
Chippelthurthy	0.00	0.00	257.59	206.33	85.98	0.00	549.90	0.00	0.00
Choutkoor	0.00	2.98	727.00	510.59	76.79	0.00	1,317.36	-30.00	0.00
Gummadidalla	0.00	23.62	850.13	163.37	62.16	1.32	1,100.60	0.00	0.00
Ibrahimbad	0.00	66.08	479.61	265.21	70.89	0.00	881.79	0.00	0.00
Kanukunta	0.00	38.71	243.15	32.70	8.72	0.00	323.28	-9.95	0.00
Khazipally	0.00	0.00	76.81	432.40	153.04	7.70	669.95	-10.54	0.00
Kowdipally	0.00	57.18	613.63	196.20	197.54	0.00	1,064.55	0.00	0.00

Mangapet	0.00	81.51	745.70	233.30	42.48	0.00	1,102.99	0.00	0.00
Mohammadanagar	0.00	573.87	512.08	42.80	64.79	0.00	1,193.54	0.00	0.00
Nagsanpally	0.00	53.23	449.99	35.14	83.94	0.00	622.30	0.00	0.00
Nallavally	0.00	3.03	437.75	87.81	562.13	0.77	1,091.49	0.00	0.00
Narayanapoor	0.00	2.34	240.28	209.46	125.88	0.00	577.96	0.00	0.00
Narsapur	0.00	31.12	906.61	219.63	77.79	0.00	1,235.15	0.00	0.00
Nathinaipally	0.00	6.23	313.83	269.73	214.75	0.00	804.54	0.00	0.00
Pilluta	0.00	27.79	345.36	103.05	57.40	0.00	533.60	0.00	0.00
Ratnapur	0.00	132.88	1,076.74	167.61	28.33	5.48	1,411.04	-10.88	0.00
Salabathpoor	0.00	145.38	217.35	21.85	21.31	0.00	405.89	0.00	0.00
Shivampet	0.00	195.39	1,130.50	234.07	134.58	8.04	1,702.58	-20.16	0.00
Sirpura	0.00	11.19	136.03	39.44	5.49	0.00	192.15	0.00	0.00
Somakapet	0.00	9.19	307.96	232.00	100.47	0.93	650.55	0.00	0.00
Tirumalpur	0.00	0.00	249.44	299.28	261.41	0.00	810.13	-16.56	0.00
Wailal	0.00	73.13	512.03	298.06	79.76	0.00	962.98	0.00	0.00
Total	**0.00**	**1581.09**	**11190.92**	**4347.06**	**2529.83**	**24.24**	**19673.14**	**-98.09**	**0.00**

RAMAYAMPET RANGE

Akkannapet	0.00	401.01	263.44	33.49	86.95	0.00	784.89	-1.90	1.90
Baithole	0.00	82.85	254.07	117.73	54.03	0.00	508.68	0.00	0.00
Datharpally	0.00	0.27	462.13	623.65	301.80	0.00	1,387.85	-2.96	2.96
Dongal Dharmaram	0.00	282.57	191.54	9.35	4.95	0.00	488.41	0.00	0.00
Gangapoor	0.00	938.93	604.86	96.21	93.06	0.00	1,733.06	0.00	0.00
Ibrahimpur	0.00	247.43	736.79	82.78	30.21	0.00	1,097.21	0.00	0.00
Jansilingapur	0.00	474.93	654.23	66.18	74.57	7.23	1,277.14	0.00	0.00
Manoharabad	0.00	71.09	607.74	378.02	130.56	1.93	1,189.34	0.00	0.00
Narsingi	0.00	337.35	803.40	217.58	161.51	2.97	1,522.81	0.00	0.00
Pathur	0.00	164.34	269.50	94.03	50.09	0.00	577.96	0.00	0.00
Ramayampet	0.00	48.12	290.45	95.75	50.65	3.39	488.36	0.00	0.00
Rampur	0.00	70.42	514.62	855.02	97.93	0.00	1,537.99	-38.60	0.00
Shankarampet	0.00	44.72	546.95	68.35	37.87	0.00	697.89	0.00	0.00
T. Mohamadapur	0.00	377.95	861.56	126.92	183.30	1.00	1,550.73	-11.01	0.00
Valllure	0.00	138.03	481.32	79.61	46.18	0.00	745.14	0.00	0.00
Waddiaram	0.00	17.49	333.33	168.95	90.93	9.41	620.11	-14.47	0.00
Total	**0.00**	**3697.50**	**7875.93**	**3113.62**	**1494.59**	**25.93**	**16207.57**	**-68.94**	**4.86**

SIDDIPET RANGE

Chilasagar	0.00	9.27	318.80	384.49	123.23	11.69	847.48	-19.12	0.00
Damarkunta	0.00	0.54	55.88	374.77	640.19	3.25	1,074.63	0.00	0.00
Dommat	0.00	0.00	85.58	357.19	23.37	0.00	466.14	9.34	0.00
Dubbak	0.00	2.40	594.46	274.63	95.13	2.37	968.99	0.00	0.00
Gajwel	0.00	0.08	765.31	544.98	160.44	9.29	1,480.10	0.00	0.00
Gambhirpoor	0.00	0.50	229.91	264.31	23.05	0.69	518.46	0.00	0.00
Godgupally	0.00	0.00	216.55	285.62	23.27	0.00	525.44	-22.93	0.00
Induperial	0.00	0.00	763.76	1,015.30	271.21	11.98	2,062.25	-12.52	0.00
Jagdevpur	0.00	0.00	772.57	339.63	38.78	0.99	1,151.97	0.00	0.00
Kondapak	0.00	1.21	878.95	360.77	62.48	4.90	1,308.31	0.00	0.00
Marpadga	0.00	4.48	903.83	837.11	128.25	26.43	1,900.10	0.00	0.00
Meenajipet	0.00	0.00	858.64	966.99	165.35	0.35	1,991.33	-6.41	0.00
Mirdoddi	0.00	1.10	388.75	121.31	49.73	0.00	560.89	-2.60	0.00

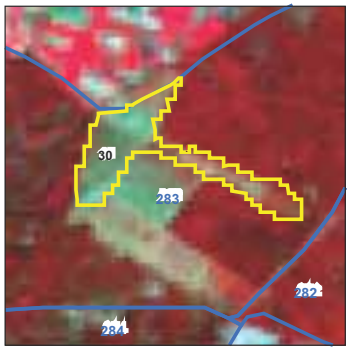
Mulug	0.00	7.31	902.54	495.34	138.87	4.63	1,548.69	-11.18	0.00
Siddipet	0.00	1.04	293.81	753.04	428.39	8.44	1,484.72	0.00	0.00
Vemulghat	0.00	0.04	1,384.41	707.56	45.49	15.40	2,152.90	0.00	0.00
Total	0.00	27.97	9413.75	8083.04	2417.23	100.41	20042.40	-65.42	0.00
ZAHEERABAD RANGE									
Didgi	0.00	0.83	13.19	84.02	261.92	0.00	359.96	0.00	0.00
Gudgarpally	0.00	370.03	551.38	128.36	336.02	24.07	1,409.86	0.00	0.00
Gudupally	0.00	323.83	653.41	149.97	645.87	3.73	1,776.81	0.00	0.00
Husselli	0.00	15.33	278.08	307.88	342.22	0.00	943.51	0.00	0.00
Pichargad	0.00	27.82	379.02	301.69	919.40	13.00	1,640.93	0.00	0.00
Sajjapur	0.00	12.11	432.99	257.31	388.17	1.28	1,091.86	0.00	0.00
Zaheerabad	0.00	43.74	201.48	202.86	362.08	23.76	833.92	0.00	0.00
Total	**0.00**	**793.69**	**2509.55**	**1432.09**	**3255.68**	**65.84**	**8056.85**	**0.00**	**0.00**
Division Total	**0.00**	**8799.66**	**45469.10**	**22490.82**	**14647.60**	**251.01**	**91658.19**	**-353.77**	**4.86**

Satellite Imageries

2012



2013



Longitude	78.64538° E
Latitude	17.72276° N
Area in Ha	11.18
Change	SF TO NF
Comp No.	283
Beat	Mulug
Range	Siddipet
Division	**Medak**



4.19 MEDAK WLM DIVISION

4.19.1. Introduction

WLM Division Medak is located in the north-western part of Andhra Pradesh State between latitudes 18^0 6' 59" N & 18^0 12' 55" N and longitudes 78^0 10' 10" E & 78^0 22' 4" E. Geographical area of the Division is **90.81 Km²**. Which is **0.94%** of the area of the District. The ground is mostly flat and undulating with gentle slope. The elevation of ground varies from 500M to 600M with occasional hills up to 638 M above MSL. Medak falls under semi-arid region of peninsular India.

Land use pattern of the Division is given in Table 4.19.1.

The climate of this Division is generally dry with temperatures ranging from 6^0 C to 46^0C and the annual rainfall is about 700 mm, received mainly from south-west monsoons.

Red earths comprising loamy sands, sandy loams and sandy clay loams; regar or black cotton soil comprising clay loams, clay and silt clay are present.

4.19.2. Recorded Forest Area:

The notified forest area of the Division is **46.71 Km²** which is **51.44%** of the geographical area. Reserved and protected forests constitute **4.605 Km²** (9.86%) and **42.107 Km²** (90.14%) of the forest area respectively.

As per Champion and Seth's classification the forests of Division fall under Mixed Dry Deciduous and Tropical Thorn Forest types.

Table 4.19.1: Land use pattern (for entire Geographical area)

Land use	Area in Km²	Percentage
Forests including Scrub	45.82	50.46%
Agriculture	26.68	29.38%
Land with Scrub	6.01	6.62%
Settlements	0.29	0.32%
Vegetation outside Forest	11.77	12.96%
Water bodies	0.24	0.26%
Total	**90.81**	**100.00%**

Source: AS per LULC map prepared by NRSC, Hyderabad in 2007

4.19.3. Protected Area:

Out of **46.71 Km²** of notified forests an area of **42.11 Km²** is included in **Pocharam WLS**, which constitutes **90.15%** of notified forests.

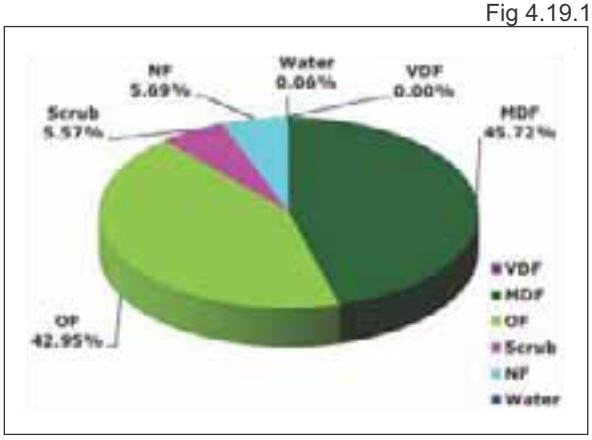
4.19.4. Community Forest Management:

There are 11 Vana Samrakshana Samities (VSSs) in the Division. An area of **21.50 Km²** forests, which is **46.02%** of notified forest area, is under the management of VSSs.

4.19.5. Forest Cover:

The forest cover in the Division based on the interpretation of IRS R2 LISS-III 2013 data (Dec 2013) is **41.27 Km²** which is **45.45%** of the geographical area. In terms of the forest canopy density classes the Division has **21.28 Km²** of Moderately Dense Forests and **19.99 Km²** of Open Forests. The area of the Scrub is **2.59 Km²**, Non-Forests **2.65 Km²** and Water Bodies **0.03 Km²**. The distribution of the forest cover of the Division is shown in Fig 4. 19.1.

Fig 4.19.1



4.19.6. Change in Forest Cover

The Satellite images of 2012 and 2013 are shown in Figs 4.19.2 & 4.19.3 respectively.

Fig 4.19.2: LISS-III Imagery of WLM Medak Division of Oct. 2012



Fig 4.19.3: LISS-III Imagery of WLM Medak Division of Dec. 2013



Comparison of the current forest cover with that of previous assessment year shows that there is no change in the forest cover during this period. The forest cover change matrix is given in Table 4.19.2.

There are 3 Beats in the Division. There are no changes in forest cover in any of the 3 Beats.

Details of forest cover in all Beats of the Division are shown in Table 4.19.3.

Table 4.19.2. Forest Cover Change Matrix: (Area in Km^2)

2012	2013						Total of 2012
	VDF	MDF	OF	Scrub	NF	WATER	
Very Dense Forest	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Moderately Dense Forest	0.00	21.28	0.00	0.00	0.00	0.00	21.28
Open Forest	0.00	0.00	19.99	0.00	0.00	0.00	19.99
Scrub	0.00	0.00	0.00	2.59	0.00	0.00	2.59
Non-Forest	0.00	0.00	0.00	0.00	2.65	0.00	2.65
Water	0.00	0.00	0.00	0.00	0.00	0.03	0.03
Total of 2013	**0.00**	**21.28**	**19.99**	**2.59**	**2.65**	**0.03**	**46.54**
Net Change	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Table 4.1.3. Beat Wise Forest Cover: Area in Ha

Beat	VDF	MDF	OF	SF	NF	WB	Total	Net Change	Encr.
POCHARAM RANGE									
Burugupally	0.00	571.74	543.86	59.72	42.32	3.00	1,220.64	0.00	0.00
Parvathapoor	0.00	988.18	323.99	98.28	131.76	0.00	1,542.21	0.00	0.00
Rajpet	0.00	568.02	1,131.30	100.15	90.89	0.00	1,890.36	0.00	0.00
Total	0.00	**2,127.94**	**1,999.15**	**258.15**	**264.97**	**3.00**	**4,653.21**	**0.00**	**0.00**
Division Total	**0.00**	**2,127.94**	**1,999.15**	**258.15**	**264.97**	**3.00**	**4,653.21**	**0.00**	**0.00**

4.20 NIZAMABAD DIVISION

4.20.1. Introduction

Nizamabad Forest Division lies in the north-western part of Nizamabad district between latitudes 18° 10' 10" N & 19° 00' 55" N and longitudes 77° 31' 17" E & 78° 40' 17" E. Geographical Area of the Division is **4751.83 Km²** which is **59.63%** of the area of district. This region lies on deccan plateau. Godavari River enters Telangana at Kandhakurthi in Nizamabad Division. Manjira River, which flows in north-west direction through thick forests of Nizamabad and Kamareddy Divisions, joins Godavari at Kandhakurthi.

Land use pattern of the Division is given in Table 4.20.1.

The climate of this Division is generally dry with temperatures ranging from 13°C to 47°C and the annual rainfall is about 1033.7 mm, received mainly from south-west monsoons.

Red soils are extensive followed by black soils in Nizamabad Division. Alluvial and lateritic soils are found occasionally and in small extent. Along the banks of Godavari and other big streams soil is loamy or alluvial and more fertile, hence support better forests. Most of the soils have morrum underneath at different depths, which support some of the good Teak forests in the Division. Variety of colored granites and the deccan trap rocks and economically valuable minerals are available in this Division.

Population of the Division is 1.54 million (2011 Census), per capita forest area is **0.05 Ha** and the population density is 294 persons per Km².

Table 4.20.1: Land use pattern (for entire Geographical area)

Land use	Area in Km²	Percentage
Forest including Scrub	705.71	14.85%
Agriculture	3342.23	70.34%
Land with Scrub	192.54	4.05%
Fallow Lands	31.84	0.67%
Settlements	31.74	0.67%
Vegetation outside Forest	45	0.95%
Water Bodies	402.77	8.48%
Total	**4751.83**	**100.00%**

Source: AS per LULC map prepared by NRSC, Hyderabad in 2007

4.20.2. Recorded Forest Area:

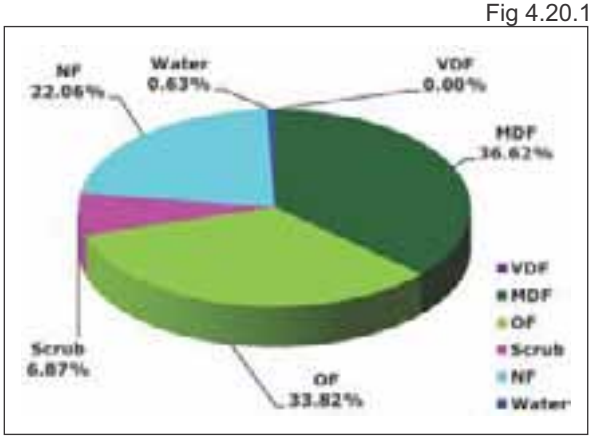
The notified forest area of the Division is **872 Km²** which is **18.35%** of the geographical area. Reserved, Protected and un-classed forests constitute **530.36 Km²** (60.85%), **319 Km²** (36.60%) and **22.26 Km²** (2.5%) of the forest area respectively.

As per Champion and Seth's classification the forests of Division fall under Tropical Dry Deciduous type.

4.20.3. Protected Area:

There is no Protected Area in the Division.

Fig 4.20.1



4.20.4. Community Forest Management:

There are 148 Vana Samrakshana Samities (VSSs) in the Division. An area of **423.48 Km²** forests, which is **48.56%** of forest area, is under the management of the VSSs.

4.20.5. Forest Cover:

The forest cover in the Division based on the interpretation of IRS R2 LISS-III 2013 data (Dec 2013) is **554.48 Km²** which is **11.67%** of the geographical area. In terms of the forest canopy density classes the Division has

288.24 Km² of Moderately Dense Forests and **266.24 Km²** of Open Forests. The area of the Scrub is **54.07 Km²,** Non-forests **173.64 Km²** and Water Bodies **4.94 Km²**. The distribution of the forest cover of the Division is shown in Fig 4.20.1.

4.20.6. Change in Forest Cover

The Satellite images of 2012 and 2013 are shown in Figs. 4.20.2 & Fig 4.20.3 respectively and the changes between this period are shown on the image of 2013.

Fig 4.20.2: LISS-III Imagery of Nizamabad Division of Oct. 2012

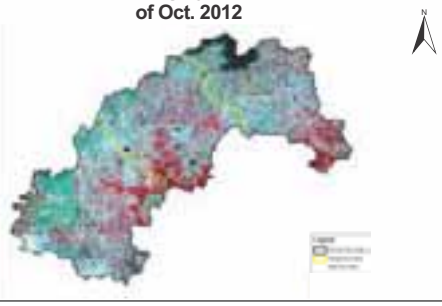
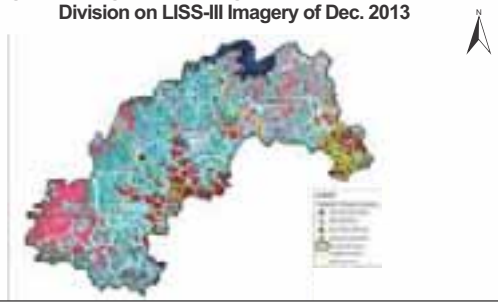


Fig 4.20.3: Vegetation Change Locations of Nizamabad Division on LISS-III Imagery of Dec. 2013



Comparison of the current forest cover with that of previous assessment year shows a negative change in forest cover of **681.88 Ha**. However, including the scrub, the total positive change is **122.20 Ha** and the total negative change is **699.57 Ha**. The forest cover change matrix given in Table 4.20.2 reveals the changes from one class to another class.

Of the total positive change including scrub of, **86.78 Ha** on account of growth in raised plantations and **35.42 Ha** is improvement of forest due to protection and management interventions. Of the total negative change including scrub of, **55.59 Ha** is on account of clearance of jungle growth for raising of plantations, **643.98 Ha** is on account of encroachments. As clearance of jungle growth for raising of plantations are forest management interventions the same are not considered as loss of forest cover. Thus only the negative change due to encroachments is taken as loss of forest cover. Therefore the **net loss of forest is 643.98 Ha** in the Division.

There are 55 Beats in the Division. Negative changes in Forest Cover are noticed in 22 Beats and Positive changes in forest cover are noticed in 9 Beats. There are no changes in the remaining 24 Beats.

Details of forest cover in all Beats of the Division are shown in Table 4.20.3.

Table 4.20.2. Forest Cover Change Matrix: (Area in Km²)

2012	2013						Total of 2012
	VDF	MDF	OF	Scrub	NF	WATER	
Very Dense Forest	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Moderately Dense Forest	0.00	288.24	0.00	2.57	1.26	0.00	292.07
Open Forest	0.00	0.00	266.24	1.23	1.76	0.00	269.23
Scrub	0.00	0.00	0.00	49.05	0.18	0.00	49.23
Non-Forest	0.00	0.00	0.00	1.22	170.44	0.00	171.66
Water	0.00	0.00	0.00	0.00	0.00	4.94	4.94
Total of 2013	**0.00**	**288.24**	**266.24**	**54.07**	**173.64**	**4.94**	**787.13**
Net Change	0.00	-3.83	-2.99	4.84	1.98	0.00	0.00

Table 4.20.3. Beat Wise Forest Cover: Area in Ha

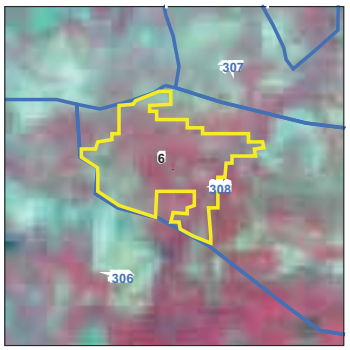
Beat	VDF	MDF	OF	SF	NF	WB	Total	Net Change	Encr.
BANSWADA RANGE									
Akbarnagar	0.00	58.48	74.29	6.62	11.65	0.00	151.03	0.00	0.00
Banswada	0.00	178.50	334.63	35.15	133.09	5.20	686.57	0.00	0.00
Bommandevpally	0.00	1,137.92	567.30	61.50	157.30	37.12	1,961.14	0.00	0.00
Chandur	0.00	288.36	435.06	64.45	241.68	0.00	1,029.56	0.00	0.00
Chillargi	0.00	20.68	951.90	421.24	691.22	21.48	2,106.51	0.00	0.00
Dhadgi	0.00	0.00	464.95	420.09	525.72	10.52	1,421.28	0.00	0.00
Hajipur	0.00	390.53	73.90	9.41	226.29	12.28	712.41	-9.00	9.00
Ibrahimpet	0.00	741.38	216.68	11.84	264.72	0.00	1,234.62	8.14	2.47
Jalalpur(w)	0.00	864.18	333.06	25.60	117.21	8.61	1,348.66	-0.99	0.99
Jallapur(e)	0.00	386.88	445.72	37.94	262.54	12.30	1,145.38	0.00	0.00
Jallapur(s)	0.00	39.22	203.23	28.58	713.09	12.38	996.51	0.00	0.00
Jukkal	0.00	0.04	12.98	54.64	391.63	0.00	459.29	0.00	0.00
Kodapgal Kalan	0.00	0.07	34.14	114.18	498.82	0.00	647.21	0.00	0.00
Kowlas	0.00	26.37	1,366.77	201.42	736.46	1.65	2,332.67	0.00	0.00
Lingampally	0.00	1.42	162.47	28.28	519.70	4.14	716.01	0.00	0.00
Mainoor	0.00	0.00	12.43	39.28	845.02	7.17	903.90	0.00	0.00
Maqdumpur	0.00	70.80	248.92	64.33	97.88	8.58	490.51	16.22	0.00
Medpally(n)	0.00	531.22	184.25	23.77	155.28	0.70	895.23	-2.73	2.73
Medpally(s)	0.00	430.37	334.90	18.61	53.26	0.00	837.14	-5.83	5.83
Mohammednagar	0.00	178.88	919.54	137.22	157.95	19.51	1,413.10	0.00	0.00
Nasrullabad	0.00	896.07	393.66	44.60	185.88	0.00	1,520.20	0.00	0.00
Nizamsagar	0.00	2.46	922.51	675.07	812.14	42.87	2,455.06	19.40	2.81
Rampur	0.00	859.71	240.55	10.11	381.76	1.44	1,493.58	0.00	0.00
Rampur Kalan	0.00	0.54	358.98	290.94	688.24	47.45	1,386.15	0.00	0.00
Shantapur	0.00	86.45	714.15	180.32	373.51	32.35	1,386.78	0.00	0.00
Taglepally	0.00	778.34	453.67	48.09	207.95	0.00	1,488.06	0.00	0.00
Total	**0.00**	**7968.85**	**10460.66**	**3053.29**	**9449.99**	**285.76**	**31218.56**	**25.21**	**23.83**
KAMMARPALLI RANGE									
Basheerabad	0.00	376.32	154.36	12.15	10.70	0.00	553.54	0.00	0.00
Bheemgal	0.00	931.39	797.13	295.52	370.28	13.49	2,407.81	-12.34	12.34
Bheemnagar	0.00	911.81	166.19	16.92	1,069.12	17.90	2,181.94	-136.23	144.48
Kammarpally	0.00	144.42	333.70	58.90	52.63	0.00	589.65	-0.69	0.69
Karepally	0.00	765.01	127.36	6.61	696.22	7.50	1,602.70	-81.19	84.55
Konapur (n)	0.00	1,365.00	1,146.39	38.84	359.61	26.12	2,935.96	-22.74	22.74
Konapur (s)	0.00	1,093.25	781.17	15.58	536.99	9.28	2,436.27	-7.70	7.70
Konasamundar	0.00	497.62	560.95	160.73	210.46	55.55	1,485.31	-8.30	8.30
Manal	0.00	647.16	251.78	40.77	904.64	6.83	1,851.18	-108.15	108.15
Mendora	0.00	371.11	99.70	10.85	330.87	0.00	812.53	-7.48	7.48
Tadlapally	0.00	1,076.03	257.30	45.17	649.89	0.00	2,028.38	-213.56	216.48
Tatpally	0.00	1,340.42	291.91	24.52	571.62	0.00	2,228.47	-7.24	7.24
Total	**0.00**	**9519.55**	**4967.94**	**726.56**	**5763.04**	**136.66**	**21113.74**	**-605.62**	**620.15**

NIZAMABAD RANGE

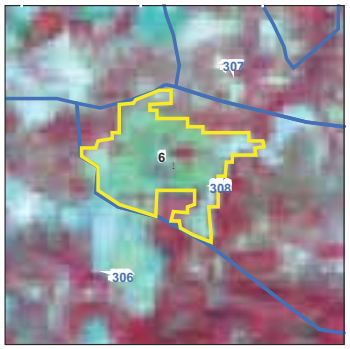
Abbapur	0.00	32.29	355.42	148.91	97.94	0.39	634.95	0.00	0.00
Amrad	0.00	461.62	307.16	10.99	23.46	0.00	803.23	0.00	0.00
Badsi	0.00	1,276.30	400.70	17.37	61.24	0.00	1,755.62	0.00	0.00
Kalpole	0.00	1,029.03	681.95	34.65	169.40	0.00	1,915.02	0.00	0.00
Kulaspur	0.00	1,025.07	533.27	91.11	73.64	0.62	1,723.71	0.00	0.00
Mallaram	0.00	353.73	1,079.64	28.05	53.27	0.00	1,514.69	0.00	0.00
Mamidipally	0.00	491.93	940.58	243.36	342.66	8.48	2,027.00	6.29	0.00
Manchippa	0.00	829.16	765.43	69.11	101.24	0.00	1,764.94	0.00	0.00
Mosra	0.00	682.45	657.98	91.35	209.34	1.12	1,642.24	-9.41	0.00
Mudakpally	0.00	762.77	437.08	22.32	128.62	0.00	1,350.79	0.00	0.00
Munipally	0.00	894.45	824.99	126.50	81.78	15.85	1,943.57	3.36	0.00
Muthukunta	0.00	612.94	917.85	19.17	28.72	0.59	1,579.26	0.00	0.00
Secundrapur	0.00	64.64	516.73	74.81	26.80	0.00	682.99	0.00	0.00
Sirpur	0.00	1,447.53	544.27	31.25	114.79	0.00	2,137.83	0.00	0.00
Thanakalan	0.00	312.78	1,161.80	299.08	203.86	28.86	2,006.37	2.80	0.00
Timmapur	0.00	1,058.30	890.54	91.98	243.24	10.24	2,294.30	0.00	0.00
Yamcha	0.00	0.00	180.99	228.17	190.14	5.36	604.66	0.00	0.00
Total	**0.00**	**11334.98**	**11196.36**	**1628.18**	**2150.13**	**71.51**	**26381.17**	**3.04**	**0.00**
Divison Total	**0.00**	**28823.38**	**26624.97**	**5408.03**	**17363.16**	**493.93**	**78713.47**	**-577.37**	**643.98**

Satellite Imageries

2012



2013



Longitude	77.85555 ° E
Latitude	18.24846 ° N
Area in Ha	13.21
Change	OF TO NF
Comp No.	308
Beat	Nizamsagar
Range	Banswada
Division	**Nizamabad**



4.21 KARIMNAGAR EAST DIVISION

4.21.1. Introduction

Karimnagar East Forest Division lies in the eastern part of Karimnagar district between latitudes 18^0 20' 53" N & 18^0 52' 14" N and longitudes 79^0 10' 48" E & 80^0 20' 44" E. Geographical area of the Division is **3,819.39 Km²** which is **32.22%** of the geographical area of district. This Division lies on deccan plateau. The River Godavari forms the northern- and eastern boundaries of the Division as wells as the district. Godavari and Maneru are main rivers of Karimnagar East Division.

Land use pattern of the Division is given in Table 4.21.1.

The climate of this Division is generally dry with temperatures ranging from 20^0C to 44^0C and the annual rainfall is about 756 mm, received mainly from Southwest monsoons.

The soil types found mainly are black cotton, sandy loam, alluvial and lateritic with less humus in top layer.

Population of the Division is 1.12 million (2011 Census), Per capita forest area is **0.12 Ha** and the population density is 542 persons per Km².

4.21.2. Recorded Forest Area:

The notified forest area of the Division is **1432.10 Km²** which is **37.50%** of the geographical area. Reserved, Protected and un-classed forests constitute **1382.13 Km²** (96.51%), **27.43 Km²** (1.92%) and **22.54 Km²** (1.57%) of the forest area respectively.

As per Champion and Seth's classification forests of Division fall under Tropical Dry Deciduous and Tropical Thorn Forest types.

Table 4.21.1: Land use pattern (for entire Geographical area)

Land use	Area in Km²	Percentage
Forest including Scrub	1333.62	34.92%
Agriculture	1292.93	33.85%
Land with Scrub	319.44	8.36%
Fallow Lands	217.32	5.69%
Settlements	0	0.00%
Vegetation outside Forest	32.87	0.86%
Water bodies	548.56	14.36%
Total	**3819.39**	**100.00%**

Source: AS per LULC map prepared by NRSC, Hyderabad in 2007

4.21.3. Protected Area:

A portion of the **Shivaram Wildlife Sanctuary** is included in this Division. An area of **19.15 Km²** is included in the WLS.

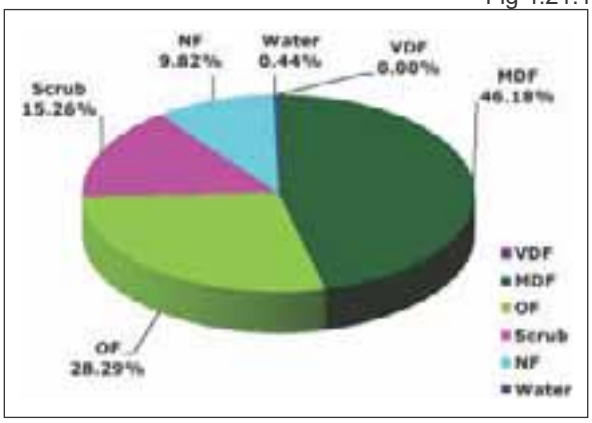
4.21.4. Community Forest Management:

There are 127 Vana Samrakshana Samities (VSSs) in the Division spread over an area of **314.05 Km²** of forest area, which is **21.93%** of the forest area.

4.21.5. Forest Cover:

The forest cover in the Division based the interpretation of IRS R2 LISS-III 2013 data (Dec 2013) is **1032.81 Km²** which is **27.04%** of the geographical area. In terms of the forest canopy density classes the Division has **640.47 Km²** of Moderately Dense Forests and **392.34 Km²** of Open Forests. The area of the Scrub is **211.63 Km²**; Non-Forest **136.22 Km²** and Water Bodies **6.14 Km²**. The distribution of the forest cover of the Division is shown in Fig 4.21.1.

Fig 4.21.1



4.21.6. Change in Forest Cover

The Satellite images of 2012 and 2013 seasons are shown in Figs 4.21.2 and Fig 4.21.3 respectively and the changes between this period are shown on the image of 2013.

Fig 4.21.2: LISS-III Imagery of Karimnagar East Division of Oct. 2012

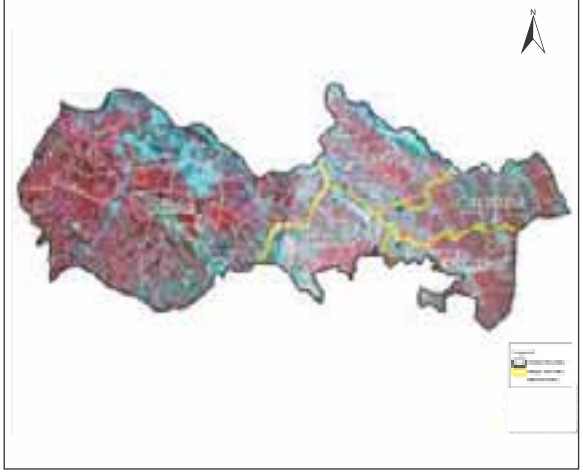
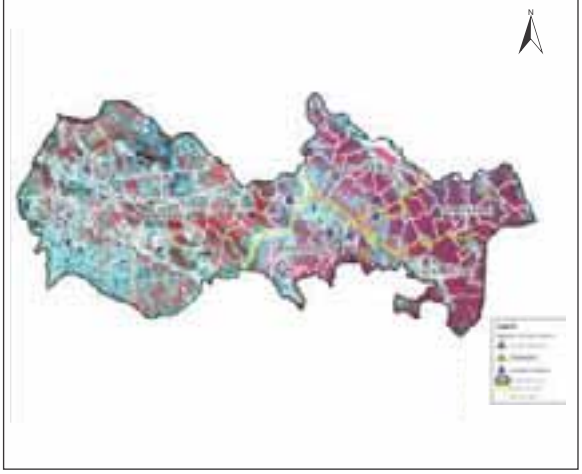


Fig 4.21.3: Vegetation Change Locations of Karimnagar East Division on LISS-III Imagery of Dec. 2013



Comparison of the current forest cover with that of previous assessment year shows a negative change of **33.35 Ha**. However including the scrub, the total negative change **96.31 Ha**. The forest cover change matrix given in Table 4.21.2 reveals the changes from one class to another class.

The total negative change including scrub of, **55.65 Ha** is on account of clearance of jungle growth for raising of plantations, **14.08 Ha** is on account of harvesting of plantations and **26.58 Ha** is on account of encroachments. As clearance of jungle growth for raising of plantations and harvesting of plantations is not considered as loss of forest cover. Thus, only the negative change due to encroachment is taken as loss of forest cover. Therefore, the **net loss of forest is 26.58 Ha** only.

There are 78 Beats in the Division. Negative changes in forest cover are noticed in 11 Beats only. There are no changes in the remaining 67 Beats.

Details of forest cover in all Beats of the Division are shown in Table 4.21.3.

Table 4.21.2. Forest Cover Change Matrix: (Area in Km^2)

2012	2013						Total of 2012
	VDF	MDF	OF	Scrub	NF	WATER	
Very Dense Forest	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Moderately Dense Forest	0.00	640.47	0.00	0.00	0.00	0.00	640.47
Open Forest	0.00	0.00	392.34	0.00	0.33	0.00	392.67
Scrub	0.00	0.00	0.00	211.63	0.63	0.00	212.26
Non-Forest	0.00	0.00	0.00	0.00	135.26	0.00	135.26
Water	0.00	0.00	0.00	0.00	0.00	6.14	6.14
Total of 2013	**0.00**	**640.47**	**392.34**	**211.63**	**136.22**	**6.14**	**1386.80**
Net Change	0.00	0.00	-0.33	-0.63	0.96	0.00	0.00

Table 4.21.3. Beat Wise Forest Cover: Area in Ha

Beat	VDF	MDF	OF	SF	NF	WB	Total	Net Change	Encr.
AZAMNAGAR RANGE									
Azamnagar	0.00	1,048.80	311.15	79.39	217.45	0.00	1,656.79	0.00	0.00
Borlaguda	0.00	730.01	319.44	30.98	345.64	0.78	1,426.85	-0.49	0.49
Erraram	0.00	192.81	184.97	71.25	990.32	1.55	1,440.90	0.00	0.00
Kanakanoor	0.00	1,240.99	343.52	42.71	279.39	0.05	1,906.66	-9.34	9.34
Khammampally	0.00	2,907.81	771.36	47.54	329.92	0.00	4,056.63	0.00	0.00
Mutharam	0.00	156.14	249.08	134.14	1,226.26	0.99	1,766.61	0.00	0.00
Nandigoan	0.00	378.27	82.10	31.22	705.38	0.86	1,197.83	0.00	0.00
Pegadapally	0.00	3,423.87	543.63	119.67	166.85	0.00	4,254.02	0.00	0.00
Polaram	0.00	164.73	369.59	194.86	605.00	0.90	1,335.08	0.00	0.00
Reddypally	0.00	2,065.10	706.23	126.96	422.87	0.00	3,321.16	0.00	0.00
Singaram	0.00	4,343.30	965.33	93.02	312.03	7.17	5,720.85	0.00	0.00
Total	**0.00**	**16,651.83**	**4,846.40**	**971.74**	**5,601.11**	**12.30**	**28,083.38**	**-9.83**	**9.83**
BHUPALPALLY RANGE									
Bhupalpally	0.00	758.13	332.44	81.14	16.52	0.00	1,188.23	0.00	0.00
Edlapally	0.00	445.75	566.15	409.35	261.14	99.60	1,781.99	0.00	0.00
Gorlaveedu	0.00	575.87	524.13	655.11	301.65	10.24	2,067.00	0.00	0.00
Kasimpally	0.00	645.14	250.49	58.97	12.02	1.21	967.83	0.00	0.00
Mallaram	0.00	1,103.99	1,367.01	1,009.59	162.57	4.46	3,647.62	0.00	0.00
Medipally	0.00	307.18	822.24	468.42	96.92	0.00	1,694.76	0.00	0.00
Mulugupally	0.00	497.62	972.47	632.67	184.97	0.67	2,288.40	-23.99	0.00
Rudraram	0.00	139.09	878.67	826.88	265.23	44.00	2,153.87	-14.46	0.00
Shatrajpally	0.00	456.05	513.71	579.58	283.37	0.00	1,832.71	0.00	0.00
Tadicherla	0.00	52.16	278.41	650.33	551.43	0.00	1,532.33	0.00	0.00
Toondla	0.00	1,303.84	650.28	242.90	103.22	0.06	2,300.30	0.00	0.00
Vallamkunta	0.00	9.32	33.82	20.67	24.15	0.34	88.30	0.00	0.00
Total	**0.00**	**6,294.14**	**7,189.82**	**5,635.61**	**2,263.19**	**160.58**	**21,543.34**	**-38.45**	**0.00**
CHINTAKANI RANGE									
Chintakani	0.00	890.04	438.70	176.22	129.89	0.92	1,635.77	0.00	0.00
Ethnaram	0.00	1,844.49	366.78	85.33	123.93	0.00	2,420.53	0.00	0.00
Khamanpally	0.00	2,401.36	1,017.68	270.04	227.56	0.00	3,916.64	0.00	0.00
Lenkalagadda	0.00	923.42	960.82	401.21	4.64	0.00	2,290.09	0.00	0.00
Lingapur	0.00	1,401.96	419.16	89.18	24.93	1.75	1,936.98	0.00	0.00
Muknoor	0.00	1,662.52	210.11	57.06	35.51	0.00	1,965.20	0.00	0.00
Neelampally	0.00	1,945.52	416.06	63.31	94.44	1.67	2,521.00	0.00	0.00
Nimmaguda	0.00	2,113.61	845.86	293.00	107.23	0.00	3,359.70	0.00	0.00
Pankena	0.00	1,984.60	1,454.08	270.58	78.96	12.75	3,800.97	0.00	0.00
Panmalla	0.00	652.83	1,118.38	325.81	434.84	1.84	2,533.70	-16.75	16.75
Peddampet	0.00	1,101.67	791.95	268.77	38.56	0.28	2,201.23	0.00	0.00
Sarvaipet	0.00	953.75	646.18	112.19	83.12	0.00	1,795.24	0.00	0.00
Singampally	0.00	2,108.27	344.46	83.28	271.90	0.55	2,808.46	0.00	0.00
Yamanpally	0.00	1,182.56	408.30	92.38	181.36	0.00	1,864.60	0.00	0.00
Total	**0.00**	**21,166.60**	**9,438.52**	**2,588.36**	**1,836.87**	**19.76**	**35,050.11**	**-16.75**	**16.75**

MAHADEVPUR RANGE

Annaram	0.00	614.19	464.19	436.84	100.76	1.26	1,617.24	-4.35	0.00
Beerasagar	0.00	1,458.99	427.06	159.56	44.45	0.00	2,090.06	0.00	0.00
Damarakunta	0.00	254.90	792.23	450.91	10.78	4.27	1,513.09	0.00	0.00
Elkeshwar	0.00	1,026.79	371.26	137.14	11.92	1.16	1,548.27	0.00	0.00
Gummallapally	0.00	1,155.46	763.56	799.95	97.49	2.33	2,818.79	0.00	0.00
Heerapur	0.00	954.87	486.92	292.78	26.89	12.89	1,774.35	0.00	0.00
Kaleshwar	0.00	869.89	514.46	174.61	18.76	19.10	1,596.82	0.00	0.00
Kataram	0.00	429.80	74.40	33.62	25.17	0.00	562.99	-3.11	0.00
Kudurupally	0.00	1,181.80	571.67	249.16	18.66	0.00	2,021.29	0.00	0.00
Mahadevpur	0.00	1,009.58	192.92	71.79	25.42	0.00	1,299.71	0.00	0.00
Nasturpally	0.00	1,112.74	204.03	111.67	84.96	0.00	1,513.40	0.00	0.00
Palgul	0.00	432.30	460.77	217.81	270.19	0.00	1,381.07	0.00	0.00
Pratapgiri	0.00	662.84	306.41	91.61	16.56	0.49	1,077.91	0.00	0.00
Rapallykota	0.00	556.98	683.64	184.36	17.60	7.00	1,449.58	0.00	0.00
Sandrupally	0.00	976.86	361.72	248.96	53.20	0.00	1,640.74	0.00	0.00
Suraram	0.00	84.11	710.97	240.56	129.77	2.27	1,167.68	-11.36	0.00
Total	**0.00**	**12,782.10**	**7,386.21**	**3,901.33**	**952.58**	**50.77**	**25,072.99**	**-18.82**	**0.00**

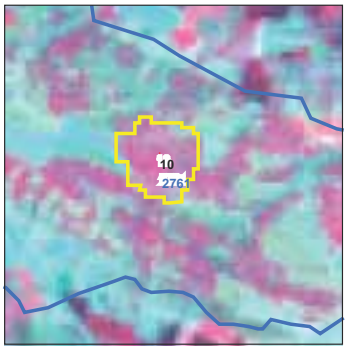
MANTHANI RANGE

Adavisrirampur	0.00	340.37	787.56	284.74	95.44	0.76	1,508.87	0.00	0.00
Arinda	0.00	17.11	468.23	600.58	120.72	1.32	1,207.96	-8.33	0.00
Begumpet	0.00	565.04	144.55	7.29	5.45	0.00	722.33	0.00	0.00
Bhatpally	0.00	70.68	506.59	371.84	23.72	0.83	973.66	0.00	0.00
Bompally	0.00	50.39	117.45	26.21	39.90	0.00	233.95	0.00	0.00
Eklashpur	0.00	369.42	530.27	444.47	10.73	0.00	1,354.89	0.00	0.00
Gajulapally	0.00	739.38	286.10	68.71	71.32	0.00	1,165.51	0.00	0.00
Gopalpur	0.00	343.06	705.04	498.01	102.65	8.75	1,657.51	-4.13	0.00
Gunjapadugu	0.00	0.00	1.61	142.41	298.82	110.32	553.16	0.00	0.00
Kalvacherla	0.00	952.14	528.77	144.97	79.78	0.00	1,705.66	0.00	0.00
Kannal	0.00	2.88	186.26	687.56	143.22	35.50	1,055.42	0.00	0.00
Khammampally	0.00	365.12	770.44	446.58	63.21	0.00	1,645.35	0.00	0.00
Khansaipet	0.00	55.15	538.88	788.00	47.10	0.00	1,429.13	0.00	0.00
Kukkalagudur	0.00	733.63	364.99	101.63	126.61	0.00	1,326.86	0.00	0.00
Kunaram	0.00	357.11	403.79	236.20	27.67	0.00	1,024.77	0.00	0.00
Lakkaram	0.00	434.71	371.60	472.76	292.14	0.98	1,572.19	0.00	0.00
Maidambanda	0.00	674.52	257.85	81.83	38.24	11.67	1,064.11	0.00	0.00
Maredugonda	0.00	28.96	493.22	516.13	277.02	0.00	1,315.33	0.00	0.00
Peddapally	0.00	350.54	497.74	167.54	187.22	0.00	1,203.04	0.00	0.00
Putnoor	0.00	228.01	368.92	113.45	9.13	0.00	719.51	0.00	0.00
Ramagundam	0.00	149.62	488.16	169.71	223.89	112.17	1,143.55	0.00	0.00
Rangapur	0.00	44.84	141.56	411.07	88.03	0.00	685.50	0.00	0.00
Sabitham	0.00	22.23	200.26	141.83	17.09	0.51	381.92	0.00	0.00

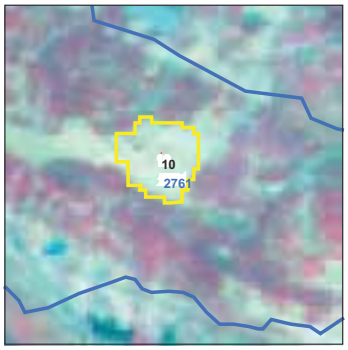
Somanpally	0.00	235.79	668.91	1,031.45	142.95	13.97	2,093.07	0.00	0.00
Takkallapally	0.00	395.07	544.62	112.24	64.25	73.67	1,189.85	0.00	0.00
Total	**0.00**	**7,525.77**	**10,373.37**	**8,067.21**	**2,596.30**	**370.45**	**28,933.10**	**-12.46**	**0.00**
Division Total	**0.00**	**64,420.44**	**39,234.32**	**21,164.25**	**13,250.05**	**613.86**	**138,682.92**	**-96.31**	**26.58**

Satellite Imageries

2012



2013



Longitude	79.79112° E
Latitude	18.64484° N
Area in Ha	8.33
Change	SF TO NF
Comp No.	274
Beat	Arinda
Range	Manthani
Division	**Karimnagar East**



4.22 KARIMNAGAR WEST DIVISION

4.22.1. Introduction

Karimnagar West Forest Division lies in the western part of Karimnagar district between latitudes 17^0 58' 58" N & 19^0 4' 37" N and longitudes 78^0 30' 56" E & 79^0 36' 54" E. Geographical area of the Division is **8,009 Km^2** which is **77.75%** of the geographical area of district. This Division lies on deccan plateau. The River Godavari forms Northern boundary of the Division. Godavari and Maneru are main rivers of Karimnagar West Division.

Land use pattern of the Division is given in Table 4.22.1.

The climate of this Division is generally dry with temperatures ranging from 20^{0}C to 44^{0}C and the annual rainfall is about 756 mm, received mainly from south-west monsoons.

The soil types found in the Division mainly are clayey loam, sandy loam and red chalkas interspersed with black cotton soils.

Population of the Division is 2.69 million (2011 Census), per capita forest area is **0.04 Ha** and the population density is 276 persons per Km^2.

4.22.2. Recorded Forest Area:

The notified forest area of the Division is **1044.71 Km^2** which is **13.00%** of the geographical area. Reserved, Protected and un-classed forests constitute **864.29 Km^2** (82.73%), **168.72 Km^2** (16.15%) and **11.70 Km^2** (1.12%) of the forest area respectively.

As per Champion and Seth's classification the forests of Division fall under Tropical Dry Deciduous and Tropical Thorn Forest types.

Table 4.22.1: Land use pattern (for entire Geographical area)

Land use	Area in Km^2	Percentage
Forest including Scrub	959.19	11.94%
Agriculture	5315.40	66.15%
Land with Scrub	732.57	9.12%
Fallow Lands	246.07	3.06%
Settlements	123.64	1.54%
Vegetation outside Forest	426.79	5.31%
Waterbodies	232.06	2.89%
Total	**8035.72**	**100.00%**

Source: AS per LULC map prepared by NRSC, Hyderabad in 2007

4.22.3. Protected Area:

There are no Protected Areas in the Division.

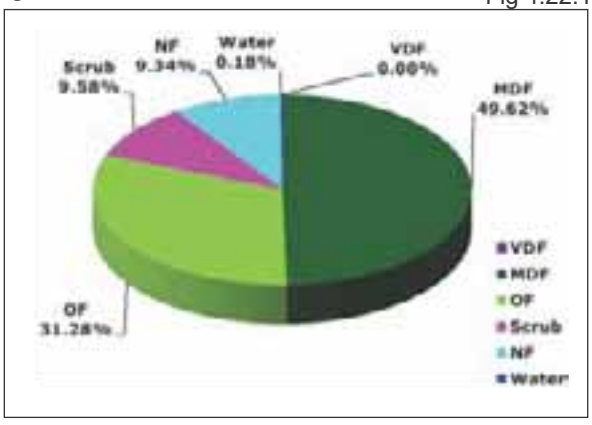
4.22.4. Community Forest Management:

There are 236 Vana Samrakshana Samities (VSSs) or JFPCs in the Division. An area of **554.499 Km^2** forests, which is **44.4%** of forest area, is under the management of VSSs.

4.22.5. Forest Cover:

The forest cover in the Division based on the interpretation of IRS R2 LISS-III 2013 data (Dec 2013) is **788.35 Km^2** which is **9.81%** of the geographical area. In terms of the forest canopy density classes, the Division has **483.49 Km^2** of Moderately Dense Forests and **304.86** Km^2 of Open Forests. The area of the Scrub is **93.35 Km^2**, Non-Forest **91.01 Km^2** and Water Bodies **1.76 Km^2**. The distribution of the forest cover of the Division is shown in Fig 4.22.1.

Fig 4.22.1



4.22.6. Change in Forest Cover

The Satellite images of 2012 and 2013 seasons are shown in Figs 4.22.2 and 4.22.3 respectively and the changes between this period are shown on the image of 2013.

Fig 4.22.2: LISS-III Imagery of Karimnagar West Division of Oct. 2012

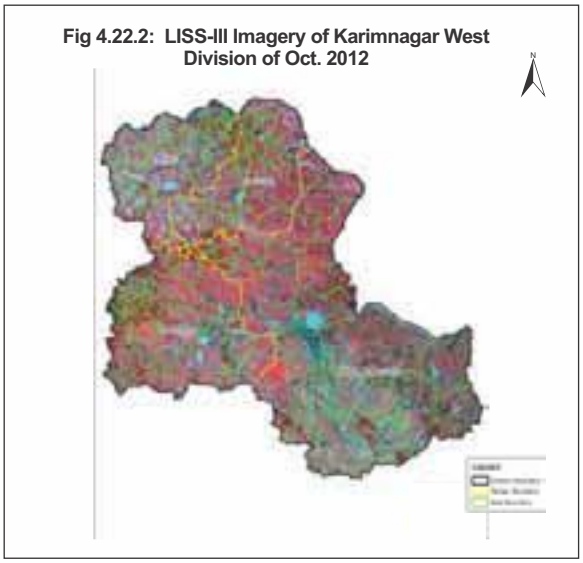
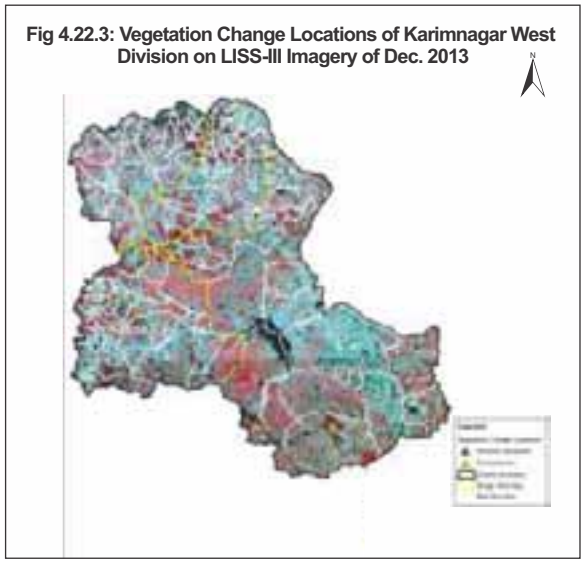


Fig 4.22.3: Vegetation Change Locations of Karimnagar West Division on LISS-III Imagery of Dec. 2013



Comparison of the current forest cover with that of previous assessment year shows a negative change of **49.79 Ha**. However, including the scrub, the total negative change **112.24 Ha**. The forest cover change matrix given in Table 4.22.2 reveals the changes from one class to another class.

The total negative change including scrub of, **39.84 Ha** is on account of advance operations for raising of plantation and **72.40 Ha** on account of encroachments. As advance operation, for raising of plantation is a Forest management intervention and hence not considered as loss of forest Cover. Thus only the negative change due to encroachments is taken as loss of forest cover. Therefore the **net loss of forest is 72.40 Ha** only.

There are 106 Beats in the Division. Negative changes in forest cover are noticed in 8 Beats only. There are no changes in the remaining 98 Beats.

Details of forest cover in all Beats of the Division are shown in Table 4.22.3.

Table 4.22.2. Forest Cover Change Matrix: (Area in Km^2)

2012	2013						Total of 2012
	VDF	MDF	OF	Scrub	NF	WATER	
Very Dense Forest	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Moderately Dense Forest	0.00	483.49	0.00	0.00	0.00	0.00	483.49
Open Forest	0.00	0.00	304.86	0.00	0.50	0.00	305.36
Scrub	0.00	0.00	0.00	93.35	0.62	0.00	93.97
Non-Forest	0.00	0.00	0.00	0.00	89.89	0.00	89.89
Water	0.00	0.00	0.00	0.00	0.00	1.76	1.76
Total of 2013	**0.00**	**483.49**	**304.86**	**93.35**	**91.01**	**1.76**	**974.47**
Net Change	0.00	0.00	-0.50	-0.62	1.12	0.00	0.00

Table 4.22.3. Beat Wise Forest Cover: Area in Ha

Beat	VDF	MDF	OF	SF	NF	WB	Total	Net Change	Encr.
JAGTIAL RANGE									
Allipur_east	0.00	184.09	27.26	4.32	21.64	0.00	237.31	0.00	0.00
Allipur_west	0.00	278.03	299.63	3.54	22.23	0.00	603.43	0.00	0.00
Battapally	0.00	291.56	247.93	77.63	15.43	3.39	635.94	0.00	0.00
Chinnapur	0.00	462.88	69.23	13.09	28.29	0.00	573.49	0.00	0.00
Donoor	0.00	488.92	355.23	44.91	20.55	0.00	909.61	0.00	0.00
Eldurthy	0.00	576.77	33.00	6.38	5.66	0.00	621.81	0.00	0.00
Govindaram	0.00	746.59	93.04	8.69	8.80	0.00	857.12	0.00	0.00
Habsipur	0.00	522.91	51.62	21.54	11.21	0.00	607.28	0.00	0.00
Kalleda	0.00	665.16	154.01	53.44	21.89	0.00	894.50	0.00	0.00
Kandlapally	0.00	746.49	358.20	82.84	187.29	12.41	1,387.23	0.00	0.00
Kolvai	0.00	299.58	198.13	217.66	380.25	0.00	1,095.62	0.00	0.00
Laxmidevipally	0.00	764.04	108.20	16.38	24.49	1.78	914.89	0.00	0.00
Maddutla	0.00	678.94	28.90	1.69	5.26	0.00	714.79	0.00	0.00
Manal	0.00	508.71	37.49	19.56	9.60	0.00	575.36	0.00	0.00
Muthkuraopet	0.00	688.27	50.17	9.19	13.35	0.00	760.98	0.00	0.00
Nagnoor	0.00	755.15	252.41	21.10	36.62	0.00	1,065.28	0.00	0.00
Narsimulapally	0.00	465.89	364.25	192.91	195.11	5.39	1,223.55	0.00	0.00
Nerella	0.00	781.46	482.05	128.10	35.87	0.00	1,427.48	0.00	0.00
Ogulapur	0.00	810.00	128.62	10.34	21.42	0.00	970.38	0.00	0.00
Rangasagar	0.00	543.78	425.75	45.90	48.73	0.00	1,064.16	0.00	0.00
Rechapally_east	0.00	483.52	90.32	19.39	141.79	0.00	735.02	0.00	0.00
Rechapally_west	0.00	303.41	12.27	1.63	45.64	0.00	362.95	0.00	0.00
Sarangapur	0.00	703.10	118.98	39.81	68.95	6.98	937.82	0.00	0.00
Talladharmaram	0.00	96.10	93.94	60.45	642.59	0.00	893.08	-39.84	0.00
Tatipally_north	0.00	426.35	39.90	3.20	28.18	0.00	497.63	0.00	0.00
Tatpally_south	0.00	482.06	87.00	10.03	39.63	0.00	618.72	0.00	0.00
Thurthi	0.00	646.33	60.68	5.92	30.38	0.00	743.31	0.00	0.00
Tuminalla	0.00	409.95	330.65	128.82	32.23	1.28	902.93	0.00	0.00
Velgonda	0.00	127.09	18.10	0.00	18.10	0.00	163.29	0.00	0.00
Waddat	0.00	1,189.56	182.76	16.12	23.92	0.00	1,412.36	0.00	0.00
Total	**0.00**	**16,126.69**	**4,799.72**	**1,264.58**	**2,185.14**	**31.23**	**24,407.36**	**-39.84**	**0.00**
KARIMANAGAR RANGE									
Bommareddypally	0.00	495.29	332.69	15.20	61.13	0.00	904.31	0.00	0.00
Dammaipet	0.00	878.88	138.11	28.43	51.73	0.00	1,097.15	0.00	0.00
Elkaturthy	0.00	25.92	19.19	3.51	6.84	0.00	55.46	0.00	0.00
Fazilnagar	0.00	952.20	188.82	16.96	10.94	0.00	1,168.92	0.00	0.00
Gangadhara	0.00	1.09	1.35	0.00	3.29	0.00	5.73	0.00	0.00
Gollakota	0.00	578.17	233.49	14.97	105.54	4.08	936.25	0.00	0.00
Kapparaopet	0.00	109.22	215.72	278.21	65.18	0.00	668.33	0.00	0.00
Karimanagar	0.00	0.00	1.26	0.00	2.08	0.00	3.34	0.00	0.00
Kodmial	0.00	804.31	104.58	13.95	28.75	0.00	951.59	0.00	0.00
Lagalamarri	0.00	578.88	366.82	36.34	25.22	0.00	1,007.26	0.00	0.00
Mirzapur	0.00	1,983.51	1,079.82	291.37	528.97	0.00	3,883.67	-2.67	2.67
Muthyampet	0.00	704.00	67.84	6.08	44.35	0.00	822.27	0.00	0.00

Raipatnam	0.00	241.59	355.72	394.30	105.77	0.00	1,097.38	0.00	0.00
Regonda	0.00	32.91	559.73	529.61	464.09	0.00	1,586.34	-24.78	24.78
Shanigaram	0.00	140.04	640.00	312.08	228.55	12.62	1,333.29	-11.44	11.44
Surampet	0.00	841.12	65.84	14.21	25.98	0.00	947.15	0.00	0.00
Tirumalapur	0.00	842.51	63.60	3.68	61.33	0.00	971.12	0.00	0.00
Total	**0.00**	**9,209.64**	**4,434.58**	**1,958.90**	**1,819.75**	**16.70**	**17,439.57**	**-38.89**	**38.89**

RAIKAL RANGE

Amberipet	0.00	728.95	137.28	35.99	70.41	0.00	972.63	0.00	0.00
Bandalingapur]	0.00	353.00	251.41	57.66	25.70	1.50	689.27	0.00	0.00
Bhupathipur	0.00	942.23	84.39	11.49	30.89	0.00	1,069.00	0.00	0.00
Bornapally_north	0.00	713.23	537.36	370.72	66.50	0.28	1,688.09	0.00	0.00
Bornapally_south	0.00	454.85	149.66	6.55	3.38	0.39	614.83	0.00	0.00
Chintakunta	0.00	1,586.45	132.60	25.46	108.11	0.00	1,852.62	0.00	0.00
Chintalur	0.00	777.55	115.29	6.82	27.49	0.00	927.15	0.00	0.00
Dabba	0.00	469.52	196.47	27.57	71.08	0.00	764.64	0.00	0.00
Devanpally	0.00	296.96	293.26	90.02	14.15	0.00	694.39	0.00	0.00
Dharmajipet	0.00	717.19	20.67	0.48	23.92	0.00	762.26	0.00	0.00
Gorrepally	0.00	729.87	250.03	102.18	90.42	0.00	1,172.50	0.00	0.00
Heerapur	0.00	449.52	141.53	1.20	4.12	0.00	596.37	0.00	0.00
Ibrahimpatnam	0.00	175.50	68.49	16.68	396.68	6.23	663.58	0.00	0.00
Katkapur_north	0.00	117.39	376.04	250.44	58.50	0.00	802.37	0.00	0.00
Katkapur_south	0.00	386.12	495.34	112.74	7.46	0.00	1,001.66	0.00	0.00
Kothapet	0.00	657.86	81.35	6.62	10.19	0.00	756.02	0.00	0.00
Laxmipur	0.00	78.85	291.30	123.16	11.18	0.00	504.49	0.00	0.00
Mallapur	0.00	46.09	111.01	79.84	136.87	7.41	381.22	0.00	0.00
Moghalpet	0.00	600.53	121.08	17.77	39.00	0.51	778.89	0.00	0.00
Rangaraopet	0.00	634.98	253.27	86.36	100.11	0.87	1,075.59	0.00	0.00
Regunta	0.00	508.71	365.41	194.18	19.35	0.00	1,087.65	0.00	0.00
Sattakkapally	0.00	58.21	66.64	0.89	3.64	0.00	129.38	0.00	0.00
Tatalvai	0.00	707.18	8.48	0.00	10.55	0.00	726.21	0.00	0.00
Vasthapur	0.00	691.22	93.28	8.79	22.63	0.00	815.92	0.00	0.00
Vempallyvenkatraopet	0.00	860.95	261.84	21.13	6.14	0.67	1,150.73	0.00	0.00
Vemulakurthy	0.00	351.46	69.61	24.78	291.59	0.00	737.44	0.00	0.00
Total	**0.00**	**14,094.37**	**4,973.09**	**1,679.52**	**1,650.05**	**17.86**	**22,414.89**	**0.00**	**0.00**

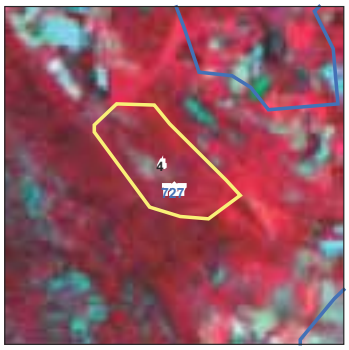
SIRCILLA RANGE

Advipadira	0.00	67.93	298.08	51.10	79.40	0.00	496.51	0.00	0.00
Akkapally	0.00	243.40	717.98	61.19	16.94	0.00	1,039.51	0.00	0.00
Almaspur	0.00	221.03	758.91	141.36	73.94	0.00	1,195.24	0.00	0.00
Chandurthy	0.00	1,008.09	58.71	2.17	13.66	0.00	1,082.63	0.00	0.00
Chirlavancha	0.00	0.00	135.72	235.13	48.03	0.00	418.88	0.00	0.00
Garjanpally	0.00	221.85	272.42	65.90	383.08	72.43	1,015.68	0.00	0.00
Gollapally	0.00	156.33	850.34	143.87	123.94	0.00	1,274.48	0.00	0.00
Gorintial	0.00	241.66	665.69	181.50	111.44	1.00	1,201.29	0.00	0.00
Gundaram	0.00	213.68	550.34	182.92	36.37	0.00	983.31	0.00	0.00
Irnapally	0.00	391.76	808.89	95.46	189.55	1.06	1,486.72	0.00	0.00
Jillella	0.00	47.53	650.64	526.14	137.75	0.50	1,362.56	0.00	0.00
Kancherla	0.00	460.55	368.42	25.97	74.12	0.00	929.06	0.00	0.00
Konaraopet	0.00	367.45	716.38	39.19	46.31	0.00	1,169.33	0.00	0.00

Lingannapet	0.00	108.15	574.91	262.19	119.44	0.00	1,064.69	0.00	0.00
Maddimalla_north	0.00	431.16	375.26	251.58	106.71	0.00	1,164.71	0.00	0.00
Maddimalla_south	0.00	194.06	412.21	373.62	102.79	0.00	1,082.68	0.00	0.00
Marrimadla_north	0.00	526.39	1,253.62	148.89	239.12	4.24	2,172.26	0.00	0.00
Marrimadla_south	0.00	158.67	515.56	123.58	91.08	5.20	894.09	0.00	0.00
Mucherla	0.00	197.42	643.73	221.32	220.90	0.00	1,283.37	0.00	0.00
Nimmapally	0.00	241.42	423.44	65.85	224.47	9.42	964.60	-3.77	3.77
Nizamabad	0.00	288.71	808.87	87.41	106.10	0.00	1,291.09	-7.33	7.33
Nookalamarri	0.00	714.64	63.90	8.14	4.05	0.00	790.73	0.00	0.00
Peddalingapur	0.00	10.24	112.20	226.11	35.64	0.00	384.19	0.00	0.00
Rudrangi_east	0.00	787.59	178.10	9.03	72.37	0.00	1,047.09	-11.17	11.17
Rudrangi_west	0.00	882.18	1,324.15	193.70	185.03	5.67	2,590.73	-11.24	11.24
Thimmapur	0.00	200.88	487.91	234.61	40.52	0.78	964.70	0.00	0.00
Vanpally	0.00	234.52	362.75	30.09	231.80	0.00	859.16	0.00	0.00
Vattimalla	0.00	182.39	1,225.16	217.14	260.48	10.02	1,895.19	0.00	0.00
Venkatapur	0.00	119.49	664.86	227.74	69.04	0.00	1,081.13	0.00	0.00
Total	**0.00**	**8,919.17**	**16,279.15**	**4,432.90**	**3,444.07**	**110.32**	**33,185.61**	**-33.51**	**33.51**
Division Total	**0.00**	**48349.87**	**30486.54**	**9335.90**	**9099.01**	**176.11**	**97447.43**	**-112.24**	**72.40**

Satellite Imageries

2012



2013



Longitude	79.09030° E
Latitude	18.12569° N
Area in Ha	24.78
Change	OF TO NF
Comp No.	727
Beat	Regonda
Range	Karimnagar
Division	**Karimnagar West**



4.23 WARANGAL NORTH DIVISION

4.23.1. Introduction

Warangal North Forest Division lies in the north-western part of Warangal district between latitudes 17^0 29' 16" N & 18^0 36' 20" N and longitudes 78^0 49' 49" E & 80^0 40' 13" E. Geographical area of the Division is **8666.70 Km²** which is **67.54%** of the geographical area of the district. The elevation of the terrain Ranges from 266 to 518 m above Mean Sea level (MSL). The general slope of the land is towards south-east, the surplus water draining into Godavari River. Dayyam vagu is one of the important rivulets flowing in the Division and passes mostly through Forest area.

Land use pattern of the Division is given in Table 4.23.1. The climate of this Division is generally dry with temperature ranging from 13.5^0C to 39.6^0C and the annual rainfall is about 1015.8 mm, received mainly from Southwest monsoons.

The soil types found mainly are black cotton, loamy, sandy and alluvial. The rocks found in this Division are Archaens, Granites, Gneisses and Dykes. The mineral resources in this Division are Iron ore, Lime stone and Coal.

Population of the Division is 2.57 million (2011 Census), per capita forest area is **0.09 Ha** and the population density is 286 persons per Km².

4.23.2. Recorded Forest Area:

The notified forest area of the Division is **2310.25 Km²** which is **26.66%** of the geographical area. Reserved, Protected and un-classed forests constitute **1579.06 Km²** (68.35%), **709.02 Km²** (30.69%) and **22.18 Km²** (0.95%) of the forest area respectively.

As per Champion and Seth's classification the forests of this Division fall under Dry Deciduous Teak Forests and Tropical Moist Deciduous Forests.

Table 4.23.1: Land use pattern (for entire Geographical area)

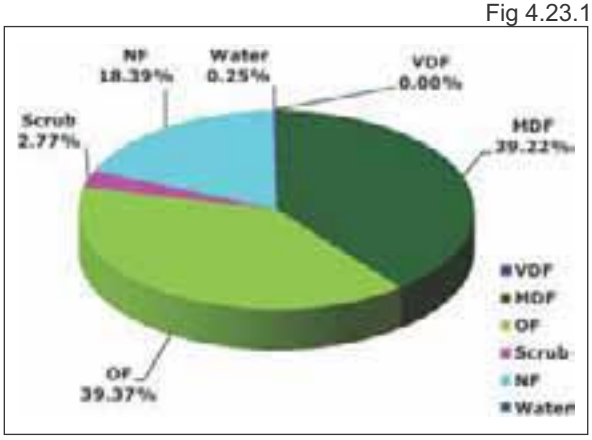
Land use	Area in Km²	Percentage
Forest including Scrub	2062.96	23.80%
Agriculture	5402.94	62.34%
Land with Scrub	353.33	4.08%
Fallow Lands	304.51	3.51%
Settlements	171.84	1.98%
Vegetation outside Forest	267.32	3.08%
Water Bodies	304.51	23.80%
Total	**8666.70**	**100.00%**

Source: AS per LULC map prepared by NRSC, Hyderabad in 2007

4.23.3. Protected Area:

There is no Protected Area in the Division, after carving out of **Warangal WLM** Division containing **Eturnagaram and Tadwai WLSs**.

Fig 4.23.1



4.23.4. Community Forest Management:

There are 127 Vana Samrakshana Samities (VSSs) in the Division. **332.38 Km²** of forest area, which is **8.95%** of the notified forests, is under the management of the VSSs.

4.23.5. Forest Cover:

The forest cover in the Division based on the interpretation of IRS R2 LISS-III 2013 data (Feb 2014) is **1815.63 Km²** which is **20.95%** of the geographical area. In terms of the forest canopy density classes the Division has **906.07 Km²** of Moderately Dense Forests and **909.56 Km²**

Open Forests. The area of the Scrub is **64.00 Km²**, Non-Forests **424.87 Km²** and Water Bodies **5.75 Km²**. The distribution of the forest cover of the Division is shown in Fig 4.23.1.

4.23.6. Change in Forest Cover

The Satellite images of 2012 and 2013 seasons are shown in Figs. 4.23.2 and 4.23.3 respectively and the changes between this period are shown on the image of 2013.

Fig 4.23.2: LISS-III Imagery of Warangal North Division of Oct. 2012

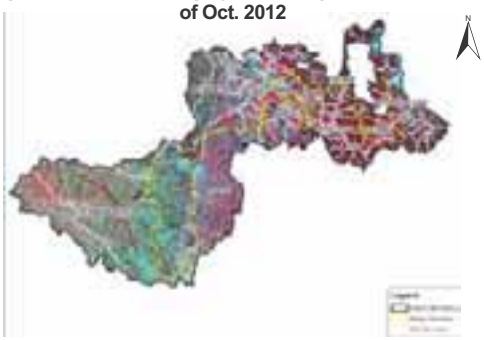
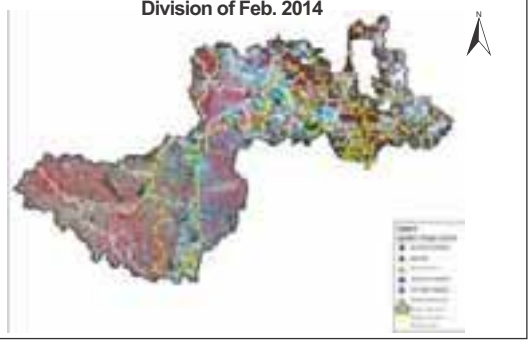


Fig 4.23.3: LISS-III Imagery of Warangal North Division of Feb. 2014



Comparison of the current forest cover with that of previous assessment year shows a positive change of **159.32 Ha** and is a negative change of **676.44 Ha**. However including the scrub, the positive change comes to **287.01 Ha** and the negative change **710.73 Ha**. The forest cover change matrix given in Table 4.23.2 reveals the changes from one class to another class.

Out of the total positive including scrub of, **283.87 Ha** is on account of growth in plantations raised, **3.14 Ha** is improvement of forest due to protection and management interventions. Out of the total negative change including scrub of, **189.28 Ha** is on account of carrying advance operations for raising of plantation, **97.31 Ha** is on account of harvesting of plantations, **2.17 Ha** is an account of diversion of forest lands for non-forestry purpose and **421.97 Ha** is on account of encroachments. As advance operations and harvesting of plantations, diversion of forest lands etc. are forest management interventions; the same are not considered as loss of forest cover. Hence the negative change on account of encroachments alone is taken as loss of forest cover. Therefore the **net loss of forest in the Division 421.97 Ha** only.

There are 84 Beats in the Division. Negative changes in the forest cover are noticed in 32 Beats and positive change in 5 Beats. There are no changes in the remaining 48 Beats.

Details of forest cover in all Beats of the Division are shown in Table 4.23.3.

Table 4.23.2. Forest Cover Change Matrix: (Area in Km²)

2012	2013						Total of 2012
	VDF	MDF	OF	Scrub	NF	WATER	
Very Dense Forest	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Moderately Dense Forest	0.00	906.07	0.00	0.89	2.00	0.00	908.96
Open Forest	0.00	0.00	907.97	0.20	3.68	0.00	911.85
Scrub	0.00	0.00	1.59	61.63	0.34	0.00	63.56
Non-Forest	0.00	0.00	0.00	1.28	418.85	0.00	420.13
Water	0.00	0.00	0.00	0.00	0.00	5.75	5.75
Total of 2013	**0.00**	**906.07**	**909.56**	**64.00**	**424.87**	**5.75**	**2310.25**
Net Change	0.00	-2.89	-2.29	0.44	4.74	0.00	0.00



Table 4.23.3. Beat Wise Forest Cover: Area in Ha

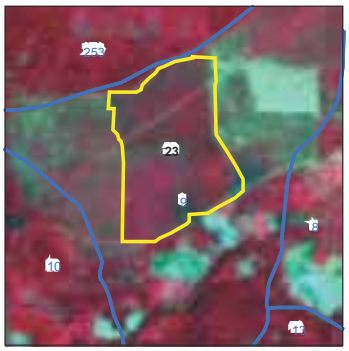
Beat	VDF	MDF	OF	SF	NF	WB	Total	Net Change	Encr.
BHULPALLI_NORTH RANGE									
Andukthanda	0.00	225.73	535.97	42.49	154.66	0.00	958.85	47.90	0.00
Bhagirthipet	0.00	8.49	389.04	236.29	467.34	0.00	1,101.17	-11.94	0.00
Chelpur	0.00	758.54	685.67	38.30	198.79	6.20	1,687.50	-67.91	0.00
Dudekulapalli	0.00	1,314.92	1,121.72	21.62	158.09	0.00	2,616.35	-2.00	2.00
Kamalapur	0.00	973.44	2,023.63	73.54	652.28	5.57	3,728.45	139.38	0.00
Mallampalli	0.00	1,042.33	606.60	16.12	207.61	0.00	1,872.65	-2.17	0.00
Nawabpet	0.00	214.07	420.68	92.36	130.97	35.53	893.61	0.00	0.00
Neredupally	0.00	3.03	374.88	86.02	739.64	1.50	1,205.07	0.00	0.00
Pambapur	0.00	141.56	464.50	19.39	907.44	22.77	1,555.66	-2.91	2.91
Peddapur I	0.00	1,200.12	801.84	23.02	57.04	0.00	2,082.02	0.00	0.00
Peddapur Ii	0.00	1,116.00	351.28	21.44	245.62	0.00	1,734.35	0.00	0.00
Pongal	0.00	62.65	340.78	85.91	390.48	0.00	879.83	0.00	0.00
Rampur N	0.00	454.04	1,241.31	49.25	295.28	0.00	2,039.88	0.00	0.00
Rampur S	0.00	1,729.78	2,764.90	93.05	486.63	0.00	5,074.36	0.00	0.00
Ravulapalli	0.00	36.74	397.45	47.45	543.72	4.83	1,030.18	0.00	0.00
Thirmalagiri	0.00	114.27	973.15	409.93	1,074.96	2.02	2,574.33	0.00	0.00
Velchal	0.00	120.44	283.82	90.49	234.84	0.66	730.24	0.00	0.00
Vencharam	0.00	65.97	914.48	237.83	1,029.60	0.00	2,247.88	0.00	0.00
Yennelamadugu	0.00	2,170.25	2,072.43	130.52	277.57	0.00	4,650.77	0.00	0.00
Total	**0.00**	**11,752.36**	**16,764.14**	**1,815.00**	**8,252.57**	**79.08**	**38,663.14**	**100.35**	**4.91**
ETURANGARAM RANGE									
Bhupathipur	0.00	1,496.36	1,065.93	18.53	315.53	0.93	2,897.29	-3.55	3.55
Chittial	0.00	1,554.84	808.50	14.60	118.44	0.00	2,496.38	0.00	0.00
Domeda	0.00	449.57	1,574.33	59.58	825.92	0.00	2,909.40	-15.34	0.00
Eturnagaram	0.00	674.96	562.72	22.58	791.48	0.00	2,051.75	-12.29	12.29
Gangaram	0.00	2,099.10	716.57	11.72	185.16	0.00	3,012.56	0.00	0.00
Gurvella	0.00	1,375.74	777.23	19.68	591.33	21.06	2,785.04	0.00	0.00
Komatpalli	0.00	348.53	1,017.34	104.56	1,276.34	2.44	2,749.20	-53.26	0.00
Mallur	0.00	803.55	395.14	8.31	225.49	0.00	1,432.50	-6.99	6.99
Mangapet	0.00	214.40	1,223.05	140.87	380.61	0.00	1,958.93	-6.95	0.00
Narsimhasagar	0.00	558.46	1,304.66	44.56	819.69	25.00	2,752.37	34.80	0.00
Puredpalli	0.00	1,160.73	1,325.49	41.84	1,128.45	0.00	3,656.50	0.00	0.00
Rajupet	0.00	630.16	119.91	10.06	156.05	0.00	916.18	0.00	0.00
Rampur_mulakatta	0.00	609.73	1,202.99	34.36	583.60	13.45	2,444.13	0.00	0.00
Rangapur	0.00	718.96	2,887.73	162.36	540.37	0.00	4,309.42	0.00	0.00
Roheer	0.00	1,416.75	1,047.00	34.82	1,321.34	86.43	3,906.33	3.14	0.00
Salpak	0.00	1,617.67	1,736.13	51.87	599.36	11.76	4,016.79	0.00	0.00
Thimmampet	0.00	875.44	1,762.19	119.45	1,553.30	4.68	4,315.06	0.00	0.00
Thimmapur	0.00	457.32	2,251.70	136.60	451.28	0.00	3,296.90	0.00	0.00
Tondyal Laxmipur	0.00	1,121.92	1,415.85	53.39	419.61	0.00	3,010.78	-2.78	2.78
Tupakulaguda	0.00	419.98	992.10	11.10	232.28	9.18	1,664.64	-2.44	2.44
Total	**0.00**	**18,604.16**	**24,186.56**	**1,100.84**	**12,515.63**	**174.93**	**56,582.12**	**-65.66**	**28.05**

MULUG RANGE									
Burgupet	0.00	2,720.63	1,760.38	80.22	455.31	0.00	5,016.54	0.00	0.00
Incherla	0.00	57.51	285.33	58.44	292.11	19.72	713.11	0.00	0.00
Jakaram	0.00	125.27	685.24	181.35	844.12	4.62	1,840.59	0.00	0.00
Kasimdevipet	0.00	829.30	820.32	76.70	248.40	0.00	1,974.71	0.00	0.00
Katrepally	0.00	106.93	829.60	91.85	427.31	0.00	1,455.69	-20.18	20.18
Machapur	0.00	674.68	640.34	56.09	108.74	0.00	1,479.85	0.00	0.00
Mulug	0.00	167.83	373.86	129.04	237.20	0.00	907.93	0.00	0.00
Nallagunta	0.00	976.09	453.40	15.90	58.09	0.00	1,503.47	0.00	0.00
Narayanpur	0.00	855.06	1,046.78	46.02	282.06	4.91	2,234.84	-33.05	0.00
Narsingapur	0.00	1,576.78	978.01	40.10	81.47	0.00	2,676.37	0.00	0.00
Palampet	0.00	86.74	473.45	61.57	448.18	6.86	1,076.79	0.00	0.00
Pandikunta	0.00	73.28	724.61	174.88	573.05	126.75	1,672.57	-36.35	0.00
Rayanguda	0.00	826.30	3,372.45	258.19	728.84	22.03	5,207.81	-5.24	5.24
Venkatapur	0.00	1,353.44	1,224.02	139.69	227.29	0.00	2,944.44	0.00	0.00
Total	**0.00**	**10,429.83**	**13,667.78**	**1,410.05**	**5,012.16**	**184.89**	**30,704.71**	**-94.82**	**25.42**
PASARA RANGE									
Alliguda S	0.00	2,447.71	564.25	10.51	-147.29	3.38	2,878.56	-29.67	29.67
Alliguda_n	0.00	2,081.18	438.17	21.46	735.70	0.00	3,276.51	-31.17	31.17
Bandal	0.00	4,791.57	987.51	12.76	536.18	0.00	6,328.02	-37.16	37.16
Bussapur	0.00	614.74	826.74	86.68	333.06	0.25	1,861.47	0.00	0.00
Karlapalli_n	0.00	915.47	2,330.16	196.47	910.34	11.57	4,364.01	0.00	0.00
Karlapalli_s	0.00	1,697.98	2,198.13	50.86	308.96	0.00	4,255.93	0.00	0.00
Kodishella_n	0.00	1,849.36	1,778.16	23.33	213.06	0.00	3,863.91	0.00	0.00
Kodishella_s	0.00	1,234.49	1,661.08	15.92	304.76	0.00	3,216.24	-75.22	75.22
Kothanagaram	0.00	1,058.57	800.29	17.84	860.91	5.79	2,743.41	0.00	0.00
Lawal	0.00	4,672.20	1,385.21	70.47	387.79	0.00	6,515.68	0.00	0.00
Lingal	0.00	2,271.12	1,276.25	27.01	1,218.05	1.99	4,794.43	-143.63	143.63
Motlaguda	0.00	2,213.76	1,877.90	55.89	398.56	0.00	4,546.11	-2.36	2.36
Narlapur	0.00	766.94	1,242.93	148.37	802.38	11.62	2,972.24	-5.54	5.54
Pasra	0.00	1,584.07	1,064.22	38.92	185.70	0.00	2,872.90	-7.89	7.89
Salvai	0.00	906.29	1,569.92	110.87	537.70	0.00	3,124.77	0.00	0.00
Yenglapur	0.00	1,334.88	1,581.34	61.12	319.84	8.83	3,306.01	0.00	0.00
Total	**0.00**	**30,440.34**	**21,582.27**	**948.49**	**7,905.69**	**43.42**	**60,920.21**	**-332.64**	**332.64**
T.P.WARANGAL RANGE									
Devnoor	0.00	23.94	457.01	65.19	95.35	0.00	641.49	0.00	0.00
Machupad	0.00	609.89	693.37	49.29	123.61	0.00	1,476.17	0.00	0.00
Nagapuri	0.00	0.00	28.49	49.44	899.37	2.97	980.27	0.00	0.00
Raghunathpalli	0.00	0.00	35.78	56.51	117.78	0.00	210.06	0.00	0.00
Tatikonda	0.00	2.56	634.99	408.66	1,366.03	4.27	2,416.50	0.00	0.00
Total	**0.00**	**636.39**	**1,849.64**	**629.09**	**2,602.13**	**7.24**	**5,724.50**	**0.00**	**0.00**
TADWAI RANGEQ									
Beerelli	0.00	1,784.34	1,458.02	37.09	1,617.90	5.29	4,902.65	-7.45	7.45

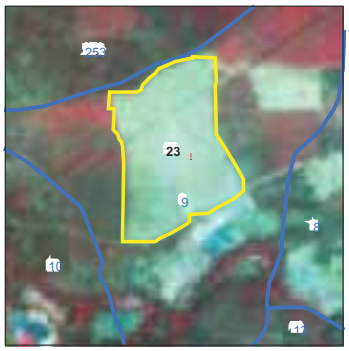
Bodiguda	0.00	2,030.26	1,229.15	31.70	297.72	24.94	3,613.76	0.00	0.00
Chinnaboinapally	0.00	1,274.68	668.83	9.60	894.78	0.00	2,847.89	0.00	0.00
Damervai	0.00	865.82	997.48	33.25	460.21	0.00	2,356.76	0.00	0.00
Katapur	0.00	1,053.85	610.32	24.59	381.39	0.00	2,070.15	0.00	0.00
Oorattam	0.00	4,452.77	3,454.95	167.02	827.09	24.68	8,926.50	-5.09	5.09
Rampur_new	0.00	1,069.84	693.01	14.04	420.04	0.00	2,196.92	-12.70	12.70
Shahpalli	0.00	1,882.59	1,239.35	44.09	759.71	21.39	3,947.14	-5.71	5.71
Souledu	0.00	2,211.56	908.47	2.06	79.65	0.00	3,201.73	0.00	0.00
Tadvai	0.00	2,120.05	1,646.19	132.18	458.55	9.86	4,366.83	0.00	0.00
Total	**0.00**	**18,745.75**	**12,905.77**	**495.61**	**6,197.03**	**86.16**	**38,430.32**	**-30.95**	**30.95**
Division Total	**0.00**	**90,608.84**	**90,956.16**	**6,399.08**	**42,485.20**	**575.73**	**231,025.01**	**-423.72**	**421.97**

Satellite Imageries

2012



2013



Longitude	80.45512° E
Latitude	18.20571° N
Area in Ha	53.26
Change	OF TO NF
Comp No.	704
Beat	Komatpalli
Range	Eturunagaram
Division	**Warangal North**



4.24 WARANGAL SOUTH DIVISION

4.24.1. Introduction

Warangal South Forest Division lies in the south-eastern part of Warangal district between latitudes 17^0 19' 05" N & 18^0 07' 04" N and longitudes 79^0 35' 32" E & 80^0 18' 32" E. Geographical area of the Division is **3,619.78 Km^2** which is **28.21%** of the geographical area of the district. The Division is having an altitude of 420 to 658 M and the plains having an altitude of 302 M above MSL.

Land use pattern of the Division is given in Table 4.24.1.

The climate of this Division is generally dry with temperatures ranging from 13.5^{0}C to 39.6^{0}C and the annual rainfall is about 1015.8 mm, received mainly from Southwest monsoons.

The soil types found mainly are black cotton, red and brown sandy loam.

Population of the Division is 0.95 million (2011 Census), per capita forest area is **0.18 Ha** and the population density is 246 persons per Km^2.

4.24.2. Recorded Forest Area:

The notified forest area of the Division is **1174 Km^2** which is **32.43%** of the geographical area. Reserved, Protected and un-classed forests constitute **572.8 Km^2** (48.79%), **599.09 Km^2** (51.03%) and **2.11 Km^2** (0.18%) of the forest area respectively.

As per Champion and Seth's classification the forests of Division fall under Dry Deciduous Teak Forests, Tropical Dry Deciduous Mixed Forests, Bamboo and Tropical Dry Mixed Teak Forests.

Table 4.24.1: Land use pattern (for entire Geographical area)

Land use	Area in Km^2	Percentage
Forest including Scrub	815.16	22.52%
Agriculture	2296.34	63.44%
Land with Scrub	177.88	4.91%
Fallow Lands	75.84	2.10%
Settlements	13.11	2.61%
Vegetation outside Forest	94.30	4.07%
Water Bodies	147.15	2.10%
Total	**3619.78**	**100.00%**

Source: AS per LULC map prepared by NRSC, Hyderabad in 2007

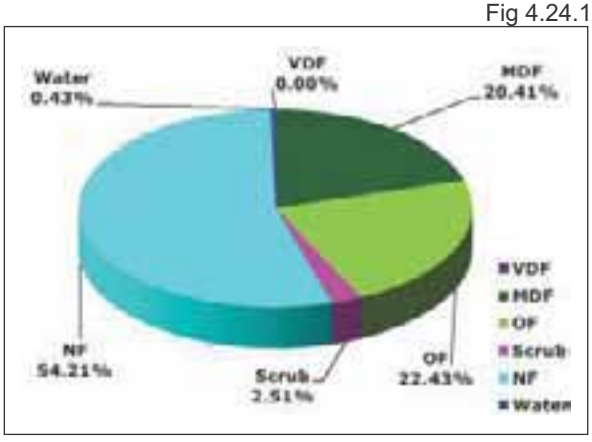
4.24.3. Protected Area:

There is no Protected Area in the Division after carving out of **Warangal WLM** Division consisting of Pakhal WLS.

4.24.4. Community Forest Management:

There are 147 Vana Samrakshana Samities (VSSs) in the Division. An area of **339.46 Km^2** of forests, which is **19.89%** of notified forest area, is under the management of the VSSs.

Fig 4.24.1



4.24.5. Forest Cover:

The forest cover in the Division based on the interpretation of IRS R2 LISS-III 2013 data (Feb 2014) is **503.27 Km^2** which is **13.90%** of the geographical area. In terms of the forest canopy density classes the Division has **239.74 Km^2** of Moderately Dense Forests and **263.52 Km^2**

of Open Forests. The area of the Scrub is **29.52 Km²**, Non-Forest **636.76 Km²** and Water Bodies **5.10 Km²**. The distribution of the forest cover of the Division is shown in Fig 4.24.1.

4.24.6. Change in Forest Cover

The Satellite images of 2012 and 2013 seasons are shown in Figs. 4.24.2 and 4.24.3 respectively and the changes between this period are shown on the image of 2013.

Fig 4.24.3: Vegetation Change Locations of Warangal South Division on LISS-III Imagery of Oct. 2012



Fig 4.24.2: LISS-III Imagery of Warangal South Division of Feb. 2014



Comparison of the current forest cover with that of previous assessment year shows a negative change of **115.57 Ha**. However including the scrub, the positive change comes to **47.92 Ha** and the negative change **308.91 Ha**. The forest cover change matrix given in Table 4.24.2 reveals the changes from one class to another class.

Out of the total positive including scrub of, **11.70 Ha** is on account of growth in plantations raised, 36.72 Ha is improvement of forest due to protection and management interventions. Out of the total negative change including scrub of, **118.67 Ha** is on account of carrying advance operations for raising of plantation and **190.24 Ha** is on account of encroachments. As advance operations etc. are forest management interventions; the same are not considered as loss of forest cover. Hence the negative change on account of encroachments alone is taken as loss of forest cover. Therefore the **net loss of forest in the Division 190.24 Ha** only.

There are 56 Beats in the Division. Negative changes in forest cover are noticed in 15 Beats and positive changes in 4 Beats only. There are no changes in the remaining 37 Beats.

Details of forest cover in all Beats of the Division are shown in Table 4.1.3.

Table 4.24.2. Forest Cover Change Matrix: (Area in Km²)

2012	2013						Total of 2012
	VDF	MDF	OF	Scrub	NF	WATER	
Very Dense Forest	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Moderately Dense Forest	0.00	239.74	0.00	0.36	0.03	0.00	240.13
Open Forest	0.00	0.00	263.52	0.25	0.51	0.00	264.28
Scrub	0.00	0.00	0.00	28.43	1.93	0.00	30.36
Non-Forest	0.00	0.00	0.00	0.48	634.29	0.00	634.77
Water	0.00	0.00	0.00	0.00	0.00	5.10	5.10
Total of 2013	0.00	239.74	263.52	29.52	636.76	5.10	**1174.65**
Net Change	0.00	-0.39	-0.76	-0.84	1.99	0.00	0.00

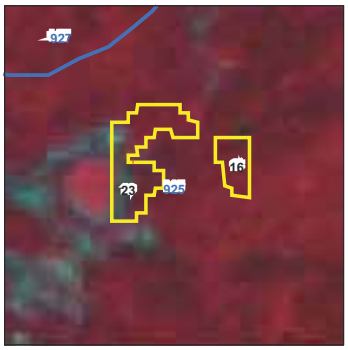
Table 4.24.3. Beat Wise Forest Cover: Area in Ha

Beat	VDF	MDF	OF	SF	NF	WB	Total	Net Change	Encr.
GUDUR RANGE									
Apparajpally	0.00	206.71	373.30	130.37	1,208.77	6.28	1,925.43	0.00	0.00
Bhupathipet	0.00	1,059.32	378.30	12.17	1,367.24	0.77	2,817.79	-3.68	3.68
Damarancha	0.00	0.03	96.56	77.83	752.20	0.00	926.62	0.00	0.00
Doravarithimmapur	0.00	2,215.03	1,644.04	43.24	655.90	0.06	4,558.28	0.00	0.00
Gajulagattu	0.00	4.24	212.53	67.52	848.52	1.85	1,134.67	0.00	0.00
Gudur	0.00	502.44	552.33	119.17	985.29	20.92	2,180.15	0.00	0.00
Gunjed	0.00	1,227.33	747.79	36.84	520.38	5.95	2,538.29	0.00	0.00
Macherla	0.00	185.14	360.96	65.87	311.47	1.57	925.01	0.00	0.00
Matwada	0.00	326.65	722.86	23.60	1,164.77	0.00	2,237.89	0.00	0.00
Nagaram	0.00	3.90	173.57	143.40	2,014.38	11.99	2,347.24	-28.81	28.81
Naikpally	0.00	6.30	199.62	63.70	816.43	18.48	1,104.53	0.00	0.00
Otla	0.00	1,063.59	877.19	40.46	1,000.08	1.03	2,982.35	0.00	0.00
Ponugodu	0.00	1.77	67.85	18.73	1,743.88	0.15	1,832.38	0.00	0.00
Raichetlapad	0.00	0.12	1.01	0.88	603.50	0.00	605.51	0.00	0.00
Total	**0.00**	**6,802.58**	**6,407.91**	**843.78**	**13,992.81**	**69.07**	**28,116.14**	**-32.49**	**32.49**
KOTHAGUDA RANGE									
Bavargonda	0.00	478.28	296.28	5.21	1,028.28	4.63	1,812.67	0.00	0.00
Buthulapally	0.00	142.41	1,160.70	158.27	1,634.85	7.91	3,104.15	-9.47	9.47
Gangaram	0.00	1,749.23	519.19	6.55	711.54	0.00	2,986.52	0.00	0.00
Gudipaddu	0.00	1,487.75	214.91	0.67	772.66	3.54	2,479.53	0.00	0.00
Gurjalemote	0.00	964.64	485.88	5.15	612.88	3.00	2,071.55	-4.77	4.77
Jangalapally	0.00	1,437.88	858.20	8.63	1,212.48	0.05	3,517.24	-16.46	20.87
Kamaram	0.00	761.49	1,660.39	19.75	1,421.52	14.43	3,877.58	-35.79	42.78
Komatlaguda	0.00	1,133.17	546.49	15.98	1,149.02	6.53	2,851.19	0.00	0.00
Kothaguda	0.00	248.86	288.95	50.57	2,020.92	15.73	2,625.03	0.00	0.00
Madaguda	0.00	893.96	742.75	32.95	1,422.13	5.53	3,097.32	0.00	0.00
Mamidiguda	0.00	781.56	742.98	11.41	1,065.24	2.10	2,603.29	-44.89	44.89
Marriguda	0.00	559.46	928.44	19.46	1,358.18	4.46	2,869.99	-7.47	7.47
Pandem-east	0.00	1,217.90	405.13	11.03	397.63	0.00	2,031.69	0.00	0.00
Pandem-west	0.00	835.63	209.89	1.79	369.94	0.00	1,417.25	0.00	0.00
Polaram	0.00	308.57	970.33	148.80	1,228.53	14.92	2,671.15	0.00	0.00
Putlabhupathi	0.00	778.20	502.75	15.91	760.64	6.05	2,063.55	0.00	0.00
Thirmalgandi	0.00	63.89	805.68	56.48	904.75	5.44	1,836.24	0.00	0.00
Total	**0.00**	**13,842.89**	**11,338.93**	**568.60**	**18,071.17**	**94.35**	**43,915.94**	**-118.85**	**130.25**
MAHBOOBABAD RANGE									
Alair	0.00	4.98	197.48	66.41	1,184.55	3.10	1,456.51	0.00	0.00
Beriwada	0.00	6.53	108.68	44.40	1,092.06	0.00	1,251.67	0.00	0.00

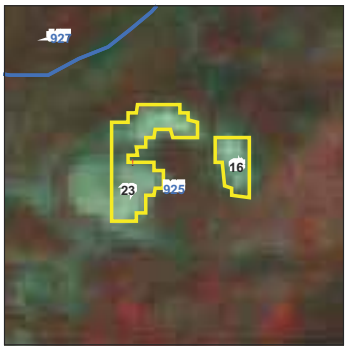
Chinnanagaram	0.00	2.16	317.18	231.46	1,031.83	15.80	1,598.43	-35.68	0.00
Edulapusapally	0.00	0.01	35.34	48.70	748.17	3.15	835.37	-16.29	0.00
Inugurthy	0.00	4.42	310.54	149.68	1,185.17	1.80	1,651.60	-55.00	0.00
Jamandlapally	0.00	1.63	93.59	50.14	1,025.31	0.11	1,170.78	0.00	0.00
Kambalpally	0.00	0.24	0.83	0.12	1,899.36	0.00	1,900.55	0.00	0.00
Kesamudram	0.00	3.70	64.86	22.32	865.16	7.74	963.78	0.00	0.00
Kongarigidda	0.00	159.58	335.43	23.34	2,004.85	4.87	2,528.07	0.00	0.00
Mahabubabad	0.00	16.90	226.55	71.70	1,464.67	11.15	1,790.98	0.00	0.00
Penugonda	0.00	0.08	78.35	46.89	520.61	3.19	649.12	0.00	0.00
Tadlapusapally	0.00	3.21	115.55	100.91	1,214.38	3.53	1,437.59	0.00	0.00
Total	**0.00**	**203.44**	**1,884.39**	**856.06**	**14,236.11**	**54.44**	**17,234.45**	**-106.97**	**0.00**
NARSAMPET RANGE									
Ashoknagar	0.00	35.79	475.11	42.62	1,242.06	49.67	1,845.25	0.00	0.00
Budharaopet	0.00	9.49	3.39	0.07	97.45	0.00	110.39	0.00	0.00
Dabeerpet	0.00	344.48	1,128.39	182.62	1,304.77	3.80	2,964.06	-9.74	9.74
Govindapur	0.00	546.86	467.68	44.23	2,897.27	116.15	4,072.20	0.00	0.00
Inchaguda(n)	0.00	69.04	391.52	21.92	1,236.07	0.98	1,719.53	0.00	0.00
Inchaguda(s)	0.00	14.12	406.44	138.45	1,899.86	82.41	2,541.27	18.17	6.65
Itkalpally	0.00	0.15	0.78	0.47	973.51	5.21	980.11	0.00	0.00
Khanapur	0.00	113.84	104.53	2.72	409.62	0.00	630.71	0.00	0.00
Musimi_ii	0.00	378.35	1,094.76	65.85	521.33	4.15	2,064.44	0.00	0.00
Musmi-1	0.00	406.61	705.11	40.64	1,108.78	10.59	2,271.73	-3.26	3.26
Pakhal	0.00	397.37	785.87	57.23	3,446.04	7.89	4,694.40	0.00	0.00
Pogallapalli	0.00	3.19	164.87	63.56	1,859.55	11.76	2,102.92	0.00	0.00
Ponugondla	0.00	806.60	992.39	24.18	378.69	0.00	2,201.86	-7.85	7.85
Total	**0.00**	**3,125.88**	**6,720.84**	**684.55**	**17,374.99**	**292.60**	**28,198.87**	**-2.68**	**27.50**
Division Total	**0.00**	**23,974.79**	**26,352.08**	**2,952.99**	**63,675.08**	**510.47**	**117,465.40**	**-260.99**	**190.24**

Satellite Imageries

2012



2013



Longitude	80.23752° E
Latitude	17.97464° N
Area in Ha	1.35
Change	SF TO NF
Comp No.	925
Beat	Kamaram
Range	Kothaguda
Division	**Warangal South**

4.25 WARANGAL WLM DIVISION

4.25.1. Introduction

Warangal WLM Forest Division lies in the north-western and south-eastern parts of Warangal district between latitudes 17° 29' 16" N & 18° 36' 20" N and longitudes 78° 49' 49" E & 80° 40' 13" E. Geographical area of the Division is **545.44 Km²** which is **4.25%** of the area of the District.

Land use pattern of the Division is given in Table 4.25.1.

The climate of this Division is generally dry with temperatures ranging from 13.5°C to 39.6°C and the annual rainfall is about 1015.8 mm, received mainly from Southwest monsoons.

Population of the Division is 0.039 million (2011 Census), per capita forest area is **1.38 Ha** and the population density is 72 persons per Km².

4.25.2. Recorded Forest Area:

The notified forest area of the Division is **538.55 Km²**. As per Champion and Seth's classification the forests of Division fall under Tropical Dry Deciduous, Tropical Moist Deciduous, Tropical Semi Evergreen and Tropical Thorn Forest types.

4.25.3. Protected Area:

The Division consists of two Protected Areas – **Etur Nagaram and Pakhal Wildlife Sanctuaries** having an area of **364.25 Km²** and **260.42 Km²** respectively.

4.25.4. Community Forest Management:

There are 43 Vana Samrakshana Samities (VSSs) in the Division. An area of **100.67 Km²** forest area which is **18.69%** of the notified forests is under the management of the VSSs.

4.25.5. Forest Cover:

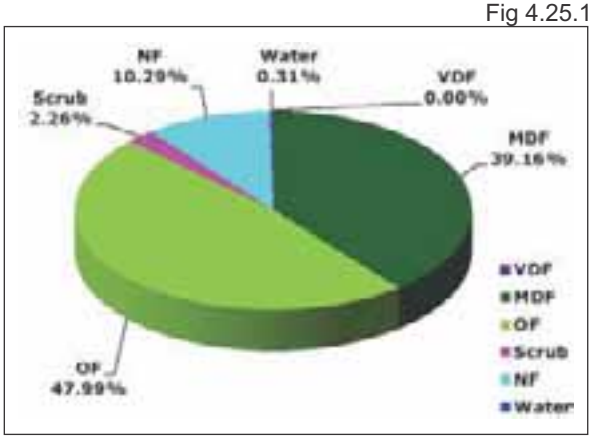
The forest cover in the Division based on the interpretation of IRS R2 LISS III 2013 data (Feb 2014) is **469.32 Km²** which is **86.05%** of the geographical area. In terms of the forest canopy density classes the Division has **210.87 Km²** of Moderately Dense Forests and **258.45 Km²** of Open Forests. The area of the Scrub is **12.14 Km²**, Non-Forests **55.42 Km²** and Water Bodies **1.66 Km²**. The distribution of the forest cover of the Division is shown in Fig 4.25.1.

Table 4.25.1: Land use pattern (for entire Geographical area)

Land use	Area in Km²	Percentage
Forest including Scrub	511.55	93.79%
Agriculture	6.86	1.26%
Land with Scrub	10.81	1.98%
Fallow Lands	0.19	0.03%
Settlements	14.99	2.75%
Vegetation outside Forest	1.04	0.19%
Water Bodies	511.55	93.79%
Total	**545.44**	**100.00%**

Source: AS per LULC map prepared by NRSC, Hyderabad in 2007

Fig 4.25.1



4.25.6. Change in Forest Cover

The Satellite images of 2012 and 2013 seasons are shown in Figs. 4.25.2 and 4.25.3 respectively and the changes between this period are shown on the image of 2013.

Fig 4.25.2: LISS-III Imagery of Warangal Wild Life Division of Oct. 2012

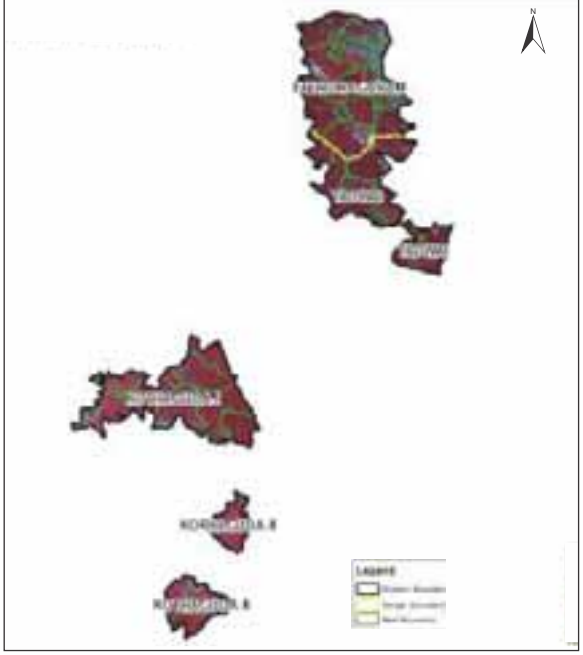
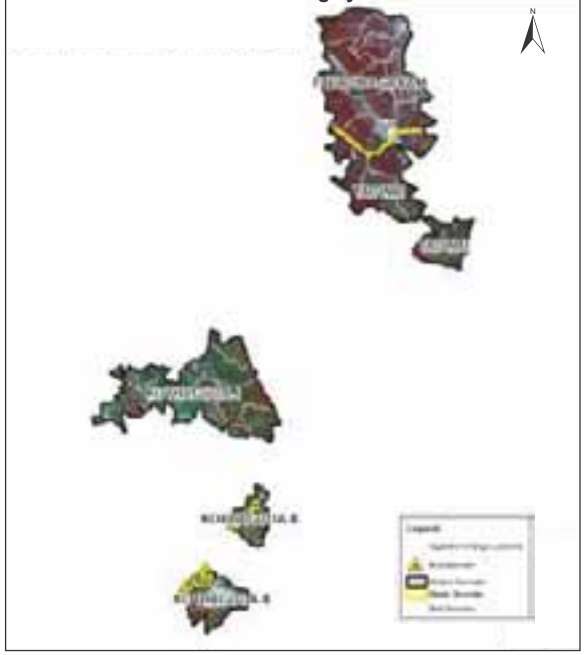


Fig 4.25.3: Vegetation Change Locations of Warangal Wild Life Division on LISS-III Imagery of Feb. 2014



Comparison of the current forest cover with that of previous assessment year shows a negative change of **28.46 Ha**. However including the scrub, negative change **32.71 Ha**. The forest cover change matrix given in Table 4.25.2 reveals the changes from one class to another class.

The entire negative change, **32.71 Ha** is on account of encroachments which is a loss of forest cover. Therefore, the **net loss of forest cover in this Division is 32.71 Ha.**

There are 30 Beats in the Division. Negative changes in forest cover is noticed in 2 Beat. There are no changes in the remaining 28 Beats.

Details of forest cover in all Beats of the Division are shown in Table 4.25.3.

Table 4.25.2. Forest Cover Change Matrix: (Area in Km^2)

2012	2013						Total of 2012
	VDF	MDF	OF	Scrub	NF	WATER	
Very Dense Forest	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Moderately Dense Forest	0.00	210.87	0.00	0.00	0.00	0.00	210.87
Open Forest	0.00	0.00	258.45	0.12	0.17	0.00	258.74
Scrub	0.00	0.00	0.00	12.02	0.04	0.00	12.06
Non-Forest	0.00	0.00	0.00	0.00	55.21	0.00	55.21
Water	0.00	0.00	0.00	0.00	0.00	1.66	1.66
Total of 2013	**0.00**	**210.87**	**258.45**	**12.14**	**55.42**	**1.66**	**538.55**
Net Change	0.00	0.00	-0.29	0.08	0.21	0.00	0.00

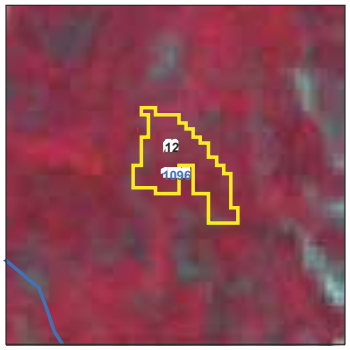
Table 4.25.3. Beat Wise Forest Cover: Area in Ha

Beat	VDF	MDF	OF	SF	NF	WB	Total	Net Change	Encr.
ETURUNAGARAM									
Chintaguda	0.00	486.26	491.36	46.16	131.96	6.30	1,162.04	0.00	0.00
Chittayal	0.00	1,028.31	801.73	19.24	143.62	0.00	1,992.90	0.00	0.00
Etur	0.00	298.69	498.27	40.34	181.62	9.56	1,028.47	0.00	0.00
Iylapur	0.00	1,535.54	774.34	17.12	122.71	0.93	2,450.64	0.00	0.00
Kondai(n)	0.00	1,225.31	525.89	3.97	53.26	0.00	1,808.43	0.00	0.00
Kondai(s)	0.00	771.49	467.02	6.53	68.41	16.80	1,330.24	0.00	0.00
Mallial(n)	0.00	1,331.34	539.97	18.06	94.94	23.05	2,007.35	0.00	0.00
Mallial(s)	0.00	1,177.94	679.02	69.99	476.48	17.50	2,420.92	0.00	0.00
Sarvai(n)	0.00	654.57	737.56	29.21	173.75	1.53	1,596.62	0.00	0.00
Sarvai(s)	0.00	545.72	868.99	52.86	190.84	0.00	1,658.41	0.00	0.00
Yelshatpally	0.00	819.01	548.77	8.41	94.70	7.12	1,478.01	0.00	0.00
Total	**0.00**	**9874.17**	**6932.93**	**311.87**	**1732.28**	**82.79**	**18934.03**	**0.00**	**0.00**
KOTHAGUDA-I									
Ankannaguda	0.00	454.20	668.08	10.90	61.95	2.44	1,197.56	0.00	0.00
Konapur	0.00	48.05	1,273.61	153.46	69.28	0.00	1,544.39	0.00	0.00
Kondapur	0.00	144.86	276.01	11.22	65.83	0.00	497.92	0.00	0.00
Medapally	0.00	477.33	830.15	104.58	701.79	2.73	2,116.59	0.00	0.00
Ootai	0.00	443.80	1,862.04	107.71	279.29	0.00	2,692.84	0.00	0.00
Pathipelly	0.00	363.77	1,052.44	62.80	112.39	3.04	1,594.43	0.00	0.00
Ponugondla	0.00	626.06	1,142.94	38.50	91.03	0.00	1,898.52	0.00	0.00
Rampur	0.00	1,028.47	1,422.05	19.78	64.96	0.00	2,535.26	0.00	0.00
Sarvapur	0.00	236.07	1,966.58	84.49	97.36	0.56	2,385.06	0.00	0.00
Total	**0.00**	**3822.59**	**10493.90**	**593.44**	**1543.87**	**8.77**	**16462.57**	**0.00**	**0.00**
KOTHAGUDA-II									
Doravarivempally	0.00	529.63	1,564.56	25.38	381.67	0.00	2,501.24	-8.39	8.39
Karlai	0.00	388.85	1,063.13	22.15	1,045.87	10.95	2,530.95	-24.32	24.32
Ootla	0.00	471.94	629.93	8.47	164.26	3.28	1,277.87	0.00	0.00
Total	**0.00**	**1390.42**	**3257.62**	**55.99**	**1591.80**	**14.22**	**6310.06**	**-32.71**	**32.71**
TADWAI									
Chinnaboinapally	0.00	517.28	632.82	22.44	37.30	0.00	1,209.85	0.00	0.00
Dodla	0.00	1,469.79	746.20	35.25	129.68	16.03	2,396.96	0.00	0.00
Heerapur	0.00	568.59	590.53	10.59	118.00	0.00	1,287.71	0.00	0.00
Kamaram	0.00	1,251.44	1,427.91	49.42	95.44	0.00	2,824.21	0.00	0.00

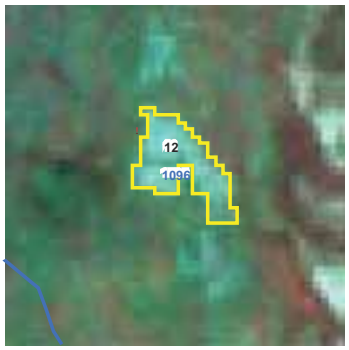
Medaram	0.00	852.62	451.63	6.88	43.16	27.46	1,381.75	0.00	0.00
Oorattam	0.00	635.03	250.26	5.15	34.23	17.53	942.20	0.00	0.00
Tadawai	0.00	705.28	1,062.60	123.01	214.52	0.00	2,105.41	0.00	0.00
Total	**0.00**	**6000.04**	**5161.95**	**252.75**	**672.34**	**61.02**	**12148.09**	**0.00**	**0.00**
Division Total	**0.00**	**21087.22**	**25846.39**	**1214.04**	**5540.29**	**166.81**	**53854.75**	**-32.71**	**32.71**

Satellite Imageries

2012



2013



Longitude	80.12903° E
Latitude	17.89766° N
Area in Ha	6.23
Change	OF TO SF
Comp No.	1096
Beat	Doravarivempally
Range	Kothaguda- II
Division	Warangal WLM



Chapter V : Forest Cover Statistics in Protected Areas

Chapter VI : Forest Cover Statistics in Joint Forest Management Areas

Chapter VII : Forest Fires in Telangana State

Chapter VIII : Assessment of Trees outside the notified Forests (TOF)



Chapter - V

Forest Cover Statistics in Protected Areas

5.1 Introduction

India being situated in the tropical region harbors rich Bio-Diversity. With just 2% of the world's land area India supports about 10% of the world's Biological Diversity making it the 7th richest Biodiversity country in the world. This distinction bestows a great responsibility on the Government to protect and conserve its rich floral, faunal and ecological diversity. This is sought to be done by establishing a network of Protected Areas. The term Protected Areas is commonly used to describe areas of ecological and biological importance like Wildlife Sanctuaries, National Parks, Zoos, Game reserves etc. An area qualifies to be declared as Protected Area when it bears some floral or faunal species of great significance, which need to be conserved or has an ecological system, which is fragile and needs to be protected. India is one of the 12 mega-biodiversity countries of the World.

The Telangana state has wide and varied vegetation types enriched by a variety of flora and fauna. Telangana being located strategically in the central region of the Indian sub-continent has representatives of the magnificent Indian plant and animal life which support a rich diversity of flora and fauna. The vegetation found in the state is largely of dry deciduous type with a mixture of Teak, Terminalias, Dalbergias, Pterocarpus, Anogeissus etc. The varied habitat harbors a diversity of fauna which includes Tiger, Panther, Wolf, Wild Dog, Hyena, Sloth Bear, Gaur, Black Buck, Chinkara, Chowsingha, Nilgai, Cheetal, Sambar and a number of Birds and Reptiles.

5.2 Protected Area Network in Telangana

The State has 12 Protected Areas – 3 National Parks, 9 Wildlife Sanctuaries. Later include 2 Tiger Reserves viz., Amarabad Tiger Reserve (ATR); Telangana part of the Nagarjuna Sagar Tiger Reserve, having the distinction of being the largest Tiger Reserve of India and Kawal Tiger Reserve in Adilabad District. Out of **26903.70 Km²** of notified forest area, **5856.04 Km²** is included in the PA network, covering an area of about 21.77% of the notified forests and 5.22% of Geographical area of the State.

The State with its rich forests and diverse flora and fauna provides ample scope for promoting Eco-Tourism. The natural beauty of the state has not been fully exposed to the visitors till now. The Government has drawn up a plan to open up the Protected Area Network of the State for visitors under the scheme of Community based Eco-tourism Project (CBET). Each of the Wildlife Sanctuary and National Park of the State has its own significance and has something unique to offer to the visitors.



5.3 Forest Cover in Protected Areas

The forest cover in the Protected Areas based on the interpretation of Resource sat-2 LISS-III 2013 data and LISS-IV 2011-2014 data is **3842.32 Km²**, i.e. 3.43% of the Geographical area. In terms of the forest canopy density classes, the PA Network has **25.96 Km²** of Very Dense Forest, **1698.06 Km²** of Moderately Dense Forest and **2118.31 Km²** of Open Forests. The area of the Scrub included is **998.85 Km²**, Non-Forest **912.30 Km²** and Water Bodies **102.58 Km²**.

Comparison of the forest cover of 2013 with that of 2012 shows a net loss of **4.93 Km²** of forest cover. Maximum habitat loss of **3.98 Km²** has occurred in Kinnerasani Wildlife Sanctuary and the least loss of **0.06 Km²** in Amrabad WLS & TR. There is no Net gain in any sanctuary. There is no loss of habitat (forest cover) in the remaining 6 WLSs.

Protected Area wise forest cover in different forest canopy density classes along with the changes compared to 2012 assessment is given in Table 5.1.

Table 5.1. **Area in Km²**

S No	Protected	VDF	MDF	OF	Net Change	Scrub	NF	WB	TOTAL	Encroachments during current assessment
1	Amrabad WLS & TR	0.04	406.42	947.56	-0.06	703.44	66.56	42.34	2166.37	0.22
2	Kawal WLS & TR	17.53	403.10	164.32	-0.06	170.72	136.46	0.87	893.00	0.06
3	Eturnagaram	0.00	407.35	314.82	-0.42	11.78	133.46	3.25	870.66	0.42
4	Pakhal WLS	0.00	161.59	318.00	-0.41	24.83	300.40	23.13	827.94	0.79
5	Kinnerasani WLS	1.70	238.47	257.65	-3.98	62.45	250.64	14.85	825.75	3.95
6	Pochram WLS	0.00	37.28	78.64	0.00	10.85	15.49	0.12	142.38	0.00
7	Pranahita WLS	6.40	39.76	12.88	0.00	2.70	6.52	0.12	68.38	0.00
8	Shivaram WLS	0.12	3.54	8.37	0.00	9.52	0.64	17.90	40.09	0.00
9	Manjeera WLS						Out of RF			
10	Mahavir harina vanasthali NP	0.13	0.49	10.89	0.00	1.90	1.67	0.00	15.07	0.00
11	Chilkur Mrugavani NP	0.00	0.03	4.06	0.00	0.42	0.46	0.00	4.97	0.00
12	KBR NP	0.04	0.03	1.12	0.00	0.24	0.00	0.00	1.43	0.00
	Total	**25.96**	**1698.06**	**2118.31**	**-4.93**	**998.85**	**912.30**	**102.58**	**5856.04**	**5.44**

**Net Change in Forest Cover Only i.e., VDF, MDF and OF to Scrub and Non-Forest between 2012 and 2013.*

As explained in Chapter II and III, the errors crept due to interpretation as well as due to the limitations in LISS-III data are corrected in this report; which shall not treated as loss in forest cover between 2012 and 2013.



Chapter - VI

Forest Cover Statistics in Joint Forest Management Areas

6.1 Introduction

Telangana state has one of the pioneering Forest Departments in India, implementing the Community Forest Management (CFM). Joint Forest Management (JFM) was introduced in Telangana in 1994 in (combined Andhra Pradesh) for protecting forests, to improve their productivity and to alleviate rural poverty in consonance with the National Forest Policy1988 and GOI circular of June 1990 on people's participation in forest management. This strategy proved effective in restoring forest cover in degraded forest lands and improved access to the forest resources by communities living in forest fringe areas. Considering the potential of the forests to contribute towards poverty alleviation the Government of combined Andhra Pradesh adopted a proactive stance by transforming JFM into CFM during 2002.

The difference between JFM and CFM is that while JFM uses participation of communities mainly for forest protection by giving them the rights to non-timber forest products (NTFP) and modest benefit-sharing in timber with limited involvement in forest management, whereas CFM aims to improve forests both in coverage and productivity by empowering VSSs to take more autonomous decisions regarding the management and use the forest resources in livelihood development. This means a greater devolution of power and responsibilities to VSSs in planning, management and decision making on the forest areas marked for the VSSs, at the same time redefining roles of FD front line staff to act as facilitators. It is important to note that combined Andhra Pradesh is the only State in the country which has adopted CFM and provided 100% of net revenue generated from the VSS forest areas with a minimum of 50% of it being required to be ploughed back in forest development works, as per the key strategy to address the use of forest resources for poverty alleviation.

6.2 Numbers and Area under VSSs

There are 3264 Vana Samrakshana Samities (VSSs) or JFPCs in the State. **6756.38 Km^2** forest area, which constitutes **25.11%** of forest area, is under CFM. Around 9.1 lakh members are involved in JFM which includes 2.3 lakh members belonging to Scheduled Tribes and 1.8 lakh members belonging to Scheduled castes.



6.3 Forest Cover in VSS Areas

The forest cover in the VSS areas based on the interpretation of Resource sat-2 LISS-III 2013 data **3794.31 Km²**, which is 3.38% of the Geographical area. In terms of the forest canopy density classes the VSSs managed forests in the State consists of **25.76 Km²** of Very Dense Forest, **1577.68 Km²** of Moderately Dense Forest and **2192.21 Km²** of Open Forest. The area of the Scrub is **1223.58 Km²**, Non-Forest is **1719.11 Km²** and Water Bodies is**18.05 Km²**.

Comparison of the forest cover of 2013 with that of 2012 shows a net loss of **10.23 Km²** of forest cover. It is seen that contribution of encroachments in the loss of forest cover in VSS areas is **5.21 Km²**.

Division wise forest cover in VSSs in different forest canopy density classes along with the changes compared to 2012 assessment is given in Table 6.1.

Table 6.1 — **Area in Km²**

S No	Division	VDF	MDF	OF	Net Change	Scrub	NF	WB	TOTAL	Encroachments during current assessment
	I. ADILABAD									
1.	Adilabad	1.20	92.79	43.90	0.00	31.95	138.04	0.25	308.13	0.00
2.	Bellampally	7.34	59.53	44.75	-0.56	25.84	40.52	0.32	178.30	0.00
3.	Kagaznagar	4.96	64.02	39.43	-0.15	8.60	30.46	0.94	148.41	0.00
4.	Mancherial	6.60	62.07	37.11	-0.24	12.65	19.07	0.15	137.65	0.02
	Total	**20.10**	**278.41**	**165.19**	**-0.95**	**79.04**	**228.09**	**1.66**	**772.49**	**0.02**
	II. KAWAL TR									
5.	Kawal (E)-Jannaram	3.68	76.47	20.74	0.00	34.85	40.86	0.15	176.75	0.00
6.	Kawal West Nirmal	1.24	57.88	90.78	0.00	70.82	86.19	0.70	307.61	0.19
	Total	**4.92**	**134.35**	**111.52**	**0.00**	**105.67**	**127.05**	**0.85**	**484.36**	**0.19**
	III. FDPT AMARABAD									
7.	Achampet WLM	0.01	38.27	91.37	-0.01	66.46	37.57	3.28	236.96	0.05
8.	Nagarjunsagar WLM	0.00	2.03	40.15	-0.05	59.82	19.88	0.13	122.02	0.18
	Total	**0.01**	**40.31**	**131.53**	**-0.06**	**126.28**	**57.45**	**3.41**	**358.98**	**0.23**
	IV. HYDERABAD									
9.	Hyderabad	0.00	51.84	87.84	0.00	124.16	92.43	0.70	356.97	0.08
10.	Mahabubnagar	0.00	12.61	222.04	0.01	191.04	56.17	0.08	481.94	0.03
11.	Nalgonda	0.00	0.11	19.94	0.29	106.43	87.03	0.24	213.75	0.03
	Total	**0.00**	**64.56**	**329.82**	**0.31**	**421.63**	**235.62**	**1.02**	**1052.66**	**0.14**

V. KHAMMAM										
12.	Bhadrachalam North	0.01	16.47	25.52	-0.13	12.90	28.65	0.27	83.83	0.07
13.	Khammam	0.03	41.82	86.22	-1.80	46.73	63.31	0.64	238.75	0.33
14.	Kothagudem	0.00	21.54	79.80	-0.41	44.62	92.57	0.11	238.64	0.06
15.	Paloncha	0.27	30.64	68.99	-1.38	24.85	64.99	0.10	189.84	1.20
16.	Paloncha WLM	0.00	111.67	143.30	-1.35	30.96	117.19	2.27	405.39	0.98
	Total	**0.73**	**161.78**	**318.00**	**-4.58**	**147.15**	**319.61**	**3.12**	**950.39**	**2.47**
VI. NIZAMABAD										
17.	Kamareddy	0.00	75.99	148.86	-0.21	22.32	77.29	1.19	325.65	0.12
18.	Medak	0.00	59.47	294.99	-0.89	133.19	139.20	0.97	627.82	0.03
19.	Medak WLM	0.00	9.75	7.00	0.00	1.43	32.03	0.00	50.21	0.00
20.	Nizamabad	0.00	111.67	143.30	-1.35	30.96	117.19	2.27	405.39	0.98
	Total	**0.00**	**256.88**	**594.15**	**-2.45**	**187.90**	**365.71**	**4.43**	**1409.06**	**1.13**
VII. WARANGAL										
21.	Karimnagar East	0.00	113.10	118.07	-0.14	74.38	26.96	1.21	333.72	0.00
22.	Karimnagar West	0.00	334.89	144.10	-0.06	47.38	95.46	0.39	622.22	0.18
23.	Warangal North	0.00	94.88	131.43	-1.72	15.47	90.02	0.57	332.37	0.44
24.	Warangal South	0.00	65.57	96.68	-0.46	15.97	160.42	0.84	339.48	0.27
25.	Warangal WLM	0.00	32.95	51.72	-0.11	2.71	12.72	0.54	100.65	0.14
	Total	**0.00**	**641.39**	**542.00**	**-2.50**	**155.91**	**385.58**	**3.55**	**1728.44**	**1.03**
	Grand Total	**25.76**	**1577.68**	**2192.21**	**-10.23**	**1223.58**	**1719.11**	**18.05**	**6756.38**	**5.21**

Encroachments are noticed in 63 VSS of the State. Totally **521 Ha** of encroachment is seen in VSS area in 19 divisions.

The 15 VSSs where the most loss of forest cover was noticed (VDF, MDF & OF) are: Jamanpet(Paloncha),jagannadhapuram(Khammam), Tadlapally(Nizamabad), Komatipalli(WarangalNorth), Mudigunta(Mancherial), Mangampeta(Paloncha), Pandikunta(WarangalNorth), Ahmednagar(kothagudem), Narayanpur(Warangal North), Anthogu(Paloncha WLM), Chinyathanda(Khammam), Minpur(Medak), Achyuthapuram(Khammam), Edulaspally-B (Warangal South), K.Lankapally(Khammam).

The VSSs, where the forest cover was gained (VDF, MDF, OF) are:
Sankaram(Mancherial),Gonakole(Nalgonda),Sirsangandla(Mahabubnagar),Bhupathiraopet(Paloncha),Kapuvarigudem(Nalgonda),Songathanda(Nalgonda),Erravally(Mahabubnagar).

*Net Change in Forest Cover Only, i.e. VDF, MDF and OF to Scrub and Non-Forest between year 2012 and 2013.

As explained in Chapter II and III, the errors crept in due to interpretation as well as due to the limitations in LISS-III data are corrected in this report; which shall not treated as loss in forest cover between 2012 and 2013.

Chapter - VII

Forest Fires in Telangana State

7.1 Introduction

Forest fires are the worst enemies of Forests and need to be controlled. Attempts have been made to prevent forest fires but the success was limited. Telangana has an area of around **26,903 Km^2** of forest land under the control of Telangana State Forest Department. Out of the above, an area of about **18,765 Km^2** prone to fires. The fires in Telangana State (**TS**) are mainly ground fires in nature and manmade. These occur between November and May. **March** is the most susceptible month for the forest fires. The ground fires cause wide spread damage to the ground flora and the young regeneration is seriously damaged. Therefore control of forest fires is a prerequisite for a healthy state of the forest.

7.2 Study of Forest Fires in Telangana State

No definite study has been carried out in TS to estimate the extent of forest fires and consequent damages. The IT wing of Forest department has carried out the Forest Fire Risk assessment by integrating various parameters governing the forest fires into consideration in a hierarchical scheme based on the degrees of influence on fire using modern IT & Geomatics tools, which fetched the department the **Silver Icon** from the Government of India in 2004. According to field observations, past fire data and vegetation characteristics, the variables were weighed in the order of influence viz., vegetation, aspect, slope and road etc. Ranking was given to each variable as per its influence. The weight factor contributes to the degree of influence in the modeling. The maps are being used for forest fire management. The **Fire Risk Zonation map** have been prepared up to Beat level and communicated for the use of field officers, based on which the field officers can take preventive measures before the commencement of fire season and avoid or minimize fires. However, the Fire Risk Map are Division independent and are not comparable between two Divisions i.e., the final classes given are Division-specific. It doesn't mean that a higher class in Adilabad Division is equivalent to that one in Paloncha Division. After the MODIS satellite data was made available by FSI & NRSC from 2004, fire occurences were noticed in **27 percent** number of the compartments (It was presumed that fire occurred in entire compartment though the pixel size of MODIS data is 250 M; moreover, MODIS information communicated by NRSC and FSI is point only, hence the extent of forest fire is not known).



As the incidence of fire only captured twice a day by MODIS sensor, when Terra and Aqua Satellites on which MODIS sensor mounted passes over that particular area, in the balance 73 percent compartments it couldn't be assessed whether these were affected by fire or not, because the forest fires occur in the evening and night too in most parts of the Telangana. For assessing the extent of forest fire, the other bands of MODIS sensor are required which are not available. Even the recent Sensor launched also failed to collect occurence of forest fires effectively which is assessed by senior officers during their field visits especially in the Districts Adilabad etc. NRSC is trying to assess the impact of forest fires using other bands of MODIS. The Forest Fire Risk Map prepared earlier is being updated using MODIS and other ancillary data.

The forest areas of Telangana are mainly dry deciduous in nature, leaves start drying up and falling on the ground from January - February and it add to the inflammable material along with twigs, branches etc. The causes of most of the forest fires in TS are deliberate or incidental. The production of Tendu leaves *(Diospyros melanoxylon)* is major cause of forest fires. Another NWFP contributing to occurence of forest fire is Mahua *(Madhuca indica)*. seasonal grain substitute, by clearing the growth below the trees by burning which may spread to adjoining forests. Another cause of fires is clearing of growth and burning for cultivation. It is reported and observed that there were fire occurrences in 75% of the forest areas every year, however, the incidences captured by MODIS data is less.

Total number of fire incidents in TS communicated by FSI and NRSC between 2004 and 2015 is **7,635**, as shown in **Table 7.1. Month-wise occurence is detailed in Table 7.2**. Total number of incidents have been reported since 2004. Most fire incidents are reported during February and March months. The Fire Locations are being sent to Field Staff through department's website (www.tgfdgis.com & www.tgfmis.com) and also through SMS alerts on the Cell phones of the concerned Officers and staff soon after receipt of data from NRSC and FSI, for speedier action in extinguishing the fire and also in assessing the extent of fire and damage done, if any.

Table 7.1: Number of fire Incidents observed through MODIS Sensor

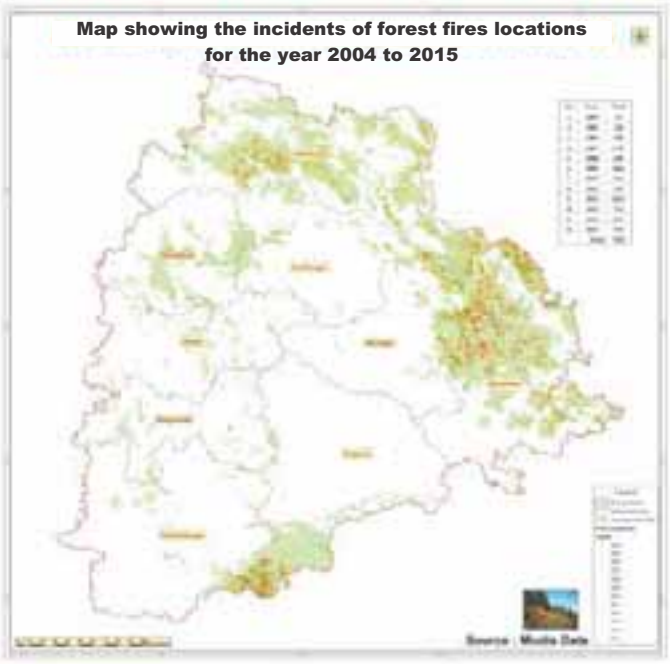
Circle/Division	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	Total
Adilabad Cirlce													
Adilabad	0	1	5	12	36	21	5	8	27	9	7	13	144
Bellampally	0	1	20	20	28	50	40	14	69	51	7	16	316
Kagaz Nagar	0	6	7	38	7	34	16	5	52	9	6	17	197
Mancherial	2	2	10	14	13	32	25	9	58	31	12	23	231
Total	**2**	**10**	**42**	**84**	**84**	**137**	**86**	**36**	**206**	**100**	**32**	**69**	**888**
Kawal Tiger Reserve Circle													
Jannaram WLM	0	7	13	21	11	43	22	6	37	36	13	35	244
Nirmal WLM	3	7	11	46	41	80	32	24	41	61	41	58	445
Total	**3**	**14**	**24**	**67**	**52**	**123**	**54**	**30**	**78**	**97**	**54**	**93**	**689**
Amrabad Tiger Reserve													
Achampet WLM	11	45	57	123	87	126	49	50	133	45	102	149	977
Nagarjuna Sagar WLM	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	**11**	**45**	**57**	**123**	**87**	**126**	**49**	**50**	**133**	**45**	**102**	**149**	**977**

Hyderabad Circle													
Hyderabad	0	0	3	2	2	1	1	4	0	2	1	0	16
Mahabub Nagar	0	0	0	3	1	0	0	1	0	0	0	0	5
Nalgonda	0	0	0	0	0	0	0	0	0	1	0	0	1
Total	**0**	**0**	**3**	**5**	**3**	**1**	**1**	**5**	**0**	**3**	**1**	**0**	**22**
Khammam Circle													
Badrachalam (N)	0	22	88	82	74	127	86	40	78	100	75	106	878
Khammam	0	7	15	24	26	39	14	16	34	31	49	35	290
Kothagudem	1	13	39	25	30	100	38	15	78	69	131	114	653
Paloncha	0	8	10	29	17	36	18	5	34	23	48	49	277
Paloncha WLM	0	4	22	13	9	39	14	6	28	16	32	36	219
Total	**1**	**54**	**174**	**173**	**156**	**341**	**170**	**82**	**252**	**239**	**335**	**340**	**2317**
Nizamabad Circle													
Kamareddy	0	1	3	10	7	8	4	1	10	8	1	12	65
Medak	0	0	2	6	5	2	2	6	6	8	3	4	44
Medak WLM	0	0	0	2	1	0	0	1	1	0	0	0	5
Nizamabad	0	0	6	10	8	14	2	2	2	12	6	13	75
Total	**0**	**1**	**11**	**28**	**21**	**24**	**8**	**10**	**19**	**28**	**10**	**29**	**189**
Warangal Circle													
Karim Nagar (E)	0	15	13	22	25	58	62	6	100	32	46	59	438
Karim Nagar (W)	1	4	12	11	14	15	10	4	15	12	10	8	116
Warangal (North)	0	49	90	90	87	135	104	42	123	129	168	139	1156
Warangal (South)	0	18	40	29	35	60	25	12	50	45	51	72	437
Warangal WLM	0	18	34	38	45	46	37	15	39	34	64	36	406
Total	**1**	**104**	**189**	**190**	**206**	**314**	**238**	**79**	**327**	**252**	**339**	**314**	**2553**
Grand Total	**18**	**228**	**500**	**670**	**609**	**1066**	**606**	**292**	**1015**	**764**	**873**	**994**	**7635**

Table 7.2: The following table shows the incidents of forest fires in different months

Month	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	Total
January	0	42	7	31	51	113	23	2	34	0	0	0	303
February	0	133	230	215	133	339	134	2	454	28	116	469	2253
March	0	45	218	353	330	573	379	148	485	490	568	460	4049
April	1	6	36	51	13	32	62	103	21	223	178	58	784
May	0	2	9	19	82	9	5	29	17	23	9	7	211
June	0	0	0	1	0	0	3	6	4	0	2	0	16
November	3	0	0	0	0	0	0	0	0	0	0	0	3
December	14	0	0	0	0	0	0	2	0	0	0	0	16
Total	**18**	**228**	**500**	**670**	**609**	**1066**	**606**	**292**	**1015**	**764**	**873**	**994**	**7635**

Map 7.2: Map shows the incidents of forest fire from 2004 to 2015



7.3 Damage caused due to Forest Fires

The most important ill effect of fires is on the young regeneration, which is killed, thereby delaying the establishment of a new crop and extending the rotation. It also leads to lower yields of plantation crops at maturity. Repeated burning leads to deterioration of site, changes in soil nutrient status and accelerated erosion due to the destruction of the ground flora. In addition, wildlife patterns and habitat may also get disrupted.

Map 7.3: Map showing the incidents of forest fires for the year 2015



In all 994 fire incidents have been observed in 2015 year, as per the MODIS data. Khammam district is worst affected by forest fires followed by Warangal and Adilabad districts. No or very less number of fire incidents have been reported in Hyderabad, Nalgonda, Rangareddy, Medak & Nizamabad districts.

Though, the incidences observed using MODIS data is not complete, an academic attempt is made to give ranking of fire incidences from the available data by making 3 classes viz., Low (<200), Medium(200-400) and High (<400) and the same is shown in Table 7.3.

Table 7.3: The Fire Rankings from 2004 to 2015

Division	Number of Fires	Rank Class
Nagarjuna Sagar WLM	0	Low
Nalgonda	1	Low
Mahabubnagar	5	Low
Medak Wlm	5	Low
Hyderabad	16	Low
Medak	44	Low
Kamareddy	65	Low
Nizamabad	75	Low
Karimnagar (West)	116	Low
Adilabad	144	Low
Kagaznagar	197	Low
Paloncha WLM	219	Medium
Mancherial	231	Medium
Jannaram WLM	244	Medium
Paloncha	277	Medium
Khammam	290	Medium
Bellampally	316	Medium
Warangal (South)	406	High
Warangal WLM	437	High
KarimNagar (East)	438	High
Nirmal	445	High
Kothagudem	653	High
Badrachalam (North)	878	High
Achampet WLM	977	High
Warangal (North)	1156	High

However, the above table will not conclude the Fire Risk of a particular division. This year, it is planned to acquire all the channel data of MODIS from NRSC/ FSI and accurately assess the exact extent of forest fires & damages, if any caused.

Further, it is observed that forest fire incidences are more in MDF and OF classes as compared to other Crown cover density classes; more in > 30% slope classes and influence of aspect on forest fire occurence is less. This hypothesis was already adopted in the Forest Fire Risk Modeling performed during 2004. The results are shown in Charts 7.1. to 7.4. Surprisingly, the more number of forest fires occurred in medium grass class than high grass class, which require further study.

Chart 7.1: Chart showing Forest Density vs. Fires from 2004 to 2015

Canopy Density	Number of Fires	% of occurences
Very Dense Forest	126	1.65
Dense Forest	3440	45.06
Open Forest	3155	41.32
Scrub Forest	720	9.43
Non Forest	194	2.54
Total	**7635**	**100**

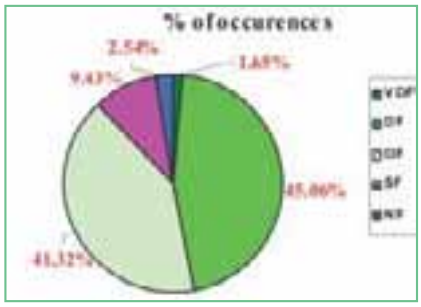


Chart 7.2: Chart showing Forest Slope vs. Fires from 2004 to 2015

Slope Class	Number of Fires	% of occurences
0 to 10	1466	19.20
> 10 to 20	953	12.48
> 20 to 30	695	9.10
> 30	4521	59.22
Total	**7635**	**100**

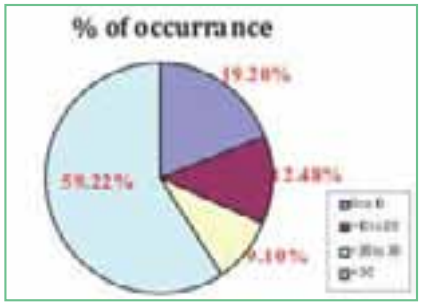


Chart 7.3: Chart showing Forest Aspect vs. Fires from 2004 to 2015

Aspect Class	Number of Fires	% of occurences
North	1116	14.26
North East	1017	13.32
East	980	12.84
South East	795	10.41
South	989	12.95
South West	1012	13.25
West	898	11.76
North West	828	10.85
Total	**7635**	**100**

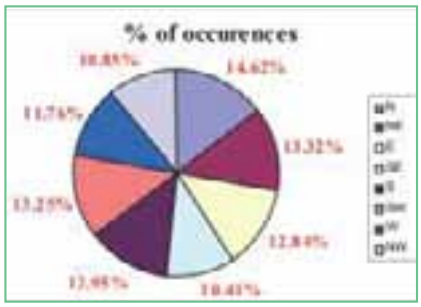
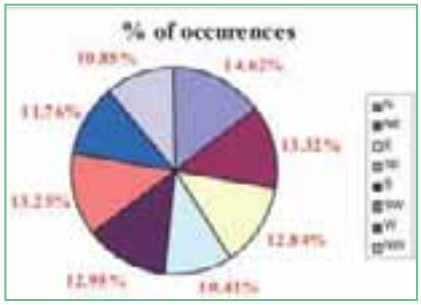


Chart 7.4: The following Chart shows Forest Grass Levels vs. Fires from 2004 to 2015

Grass Class	Number of Fires	% of occurences
High	1047	13.72
Medium	4095	53.63
Low	2470	32.35
Very Low	23	0.30
Total	**7635**	**100**



Chapter - VIII

Assessment of Tree cover outside the notified Forests

8.1 Introduction

Sustainable use and development of natural resources has become a key issue for the survival of the mankind. Forest is one of the most important natural resources. There has been a serious threat to the forest ecosystem due to human interference and unscientific exploitation. Therefore, there is an urgent need to conserve the existing gene pool in-situ before it is lost forever, for which assessment of the status of the natural resources is vital. One of the important natural resources is the forests and wildlife. Trees growing in side and outside the notified forests play a very important role in our life. The significance of Trees can be briefly summarized as:

- **Ecological Reasons:** Biomass, Carbon sequestration, Micro climate, Biodiversity (Ecosystem, Species, Gene), Watershed functions (soil and water conservation), Pollution control (Air, Noise), Wind break/shelter belts
- **Economic Reasons:** Wood, Wood fuel, small timber, poles, bamboo, NWFP (Food, Medicines, Pesticides, Fruits, Fodder, flower, etc.), Services (Ecotourism)
- **Social/Cultural Reasons:** Religion, Subsistence, Aesthetic, Recreation, Education, Employment

Due to increase in the population, human beings are cutting down more and more trees to meet their daily needs, which are proving to be harmful. This cutting is leading to the rise of natural calamities, such as floods, landslides or land erosion. It can be prevented by planting of trees. According to the recent forest cover assessment done by the Telangana State Forest Department, out of the recorded forest areas of **26903.70Km^2**, the forest cover (areas having vegetation cover of > 0.1 canopy density) Telangana is **16504.33 Km^2** (**286.06Km^2** of Very Dense Forest, **7789.48Km^2** of Moderately Dense Forest and **8428.19Km^2** of Open Forest) which is 14.72% of the Geographical



area (**112102 Km^2**). Although the sustainable management of forest has been established as a priority by the government, the loss of forest cover remains a major concern in the region. During the last (3) decades, Telangana has experienced highest negative rates of forest area change. This deforestation is mainly attributed to the expansion of encroachments due to poverty, inequitable land distribution, population growth, smuggling, loss of regeneration due to grazing, incidence of fires, poaching etc. Out of these reasons, encroachments over forest areas caused large scale deforestation. This process of loss of forest cover has produced an increase of forest fragmentation. To negate this, Government of Telangana has launched the flagship programme **Telanganaku Hairitha Haram** with an objective to increase the forest cover to 33% of the Geographical Area of the State. The goal of achieving 33% tree cover, is sought to be achieved by taking up activities inside and outside notified forests. The state government has planned for planting of 230 crore seedlings/saplings in a period of 4 years which included planting and development of 100 crore in notified forests, planting of 120 crore in outside forests and 10 crore in HMDA limits. It works out to 40 lakh seedlings per Assembly Constituency and 40,000 plants per village. This will make status of Telangana to BANGARU TELANGANA.

8.2 Importance of TOF

The increasing forest cover loss and fragmentation of forests on one hand, the need to conserve remnants of representative forest ecosystems and the increasing demand for forest products in developing countries on the other hand; makes the development of innovative sustainable management tools imperative for other less studied tropical forest resources such as Trees Outside Forests (ToF).

TOF, which comprise all trees excluded from the definition of forest and other wooded land, are embedded in a landscape matrix composed by different land-uses. Trees outside forest (TOF) generally include trees on farmlands, in cities and human settlements, orchards, roadsides, pastures, banks of river, streams, canals and shelter belts (FAO 1998). The area occupied by TOF, the species composition, the volume, as well as specific characteristics such as the geometry and spatial distribution, can change depending on the biophysical, socioeconomic and political characteristics of a particular land scape. It is recognized that TOF embrace not only many ecological functions but also economic functions. And yet, Trees outside forests remain a sort of overlooked and hidden treasure.

In India forest legislation also extends to TOF (e.g. as regards felling permits). Little is known about the dynamics of the tree resource outside forests. Data is therefore important as a foundation for developing management options to help sustain tree cover. With changing of priorities of the people and development of the technology, it is essential to estimate the Growing stock outside the Forests as they reduce pressure on the natural/notified forests and also play an important role in the maintaining ecological balance, besides providing many other services. These also help conserve bio diversity, control erosion and provide fuel wood, fodder, fiber and small timber etc. Hence, assessment of Trees outside the Forest, in a way provides necessary inputs for sustainable management of the notified forests as well.

Keeping the above in view, Forest Survey of India (FSI) commenced estimation of TOF on a small scale in India in the year 1995 and for the entire country in 2003. However, the assessment of TOF by FSI suffers from the limitation of the small size of the sampling. Results based on this assessment do not reflect the true picture at the state and district levels.

Hence State Forest Department has decided to take up assessment of TOF.

8.3 OBJECTIVES:

The main objective of the TOF field inventory is to collect qualitative and quantitative information about the trees outside forest resources within precision limits, in preparing reports to serve data needs of development planning.

- To estimate the total number of trees in TOF,
- To estimate the volume of standing TOF,
- To evaluate the contribution of TOF in timber production,
- To evaluate the contribution of TOF in fuel wood, fodder and NTFP production,
- To estimate the contribution of TOF in tree cover,
- For developing management options to maintain tree cover and plan wood production and
- To delineate the areas outside notified forests to be considered as "Deemed Forests"

8.4 Field Inventory:

The inventory of the whole population requires large amount of money, time and qualified personnel. Due to the limitations of time money and qualified personnel, sampling is the best solution to obtain the required information (De Gier). Hence, stratified random sampling is resorted to.

8.4.1. Sampling Design

The sampling design has been finalized by the Geomatics Center through intensive ground verification and in consultation with senior officers and field officers. For the enumeration purpose, each district was chosen as a primary sampling unit. High resolution Cartosat 1 Imagery has been used for stratification of the entire district various homogeneous strata. The Cartosat 1 imagery was geo-referenced using GCPs collected in the field and with the help of DEM of ASTER & SRTM, and also Google Earth, Bhuvan & topomaps, as and when required. The Sampling Frame (Sample Size, Number of Samples, Size of the Sampling Unit, Sampling Intensity) for each Stratum was done by intensive field visits made by the Officers of the Geomatics Center in consultation with senior officers & field officers of the Department. After rigorous exercise, it was decided :

- To have more number of samples with smaller size than few number of bigger samples, since more samples cover more area and better accuracy is achieved. It also meets the criteria of optimal sample size with same resources and time.
- To adopt FSI method, as nearly as possible, for easy comparison and universal acceptance.
- To collect more parameters, but as simple as possible, keeping in view the time and other resource limits.

The maps showing the locations (longitude and latitude) where the detailed inventory was to be made, were overlaid on topomaps and supplied to field officers. The Plot Approach/Description - and Plot Enumeration forms were finalized and communicated to field officers. The detailed procedure for conducting field inventory was communicated to field officers in the form of a Manual in Telugu and English. Crew Leaders were formed at each Division. Necessary trainings were conducted in laying of Plots and carrying out enumeration, at each Circle up to ABO level and (4) trainings at the State Forest Academy, Dulapally to Crew Leaders as well as FROs and above.

The inventory design for various classes is as follows:

a) **Natural Class:** Since the tree cover is similar to that of notified forest areas, the regular inventory methodology used for Forest areas has been adopted for this category. Two stage sampling viz., Pre-inventory and final-inventory method has been adopted.

- The number of sample points required N required has been estimated using probability proportionate stratified random sampling method. Sampling intensity was 0.01%.
- Initially Pre-inventory has been conducted at 15 points randomly selected from above for each class. Based on variance in the population, the number of samples points N required has been estimated using t-distribution at allowable error of 20% for carrying out the final inventory.
- Maximum of (i) and (ii) has been considered as N required
- The information collected during pre-inventory has been reused in generation of final statistics.
- **0.1 Ha** sample plot has been adopted for pre-inventory and final inventory.

b) Plantations

I. Block: The crop in a block is generally uniform in nature in terms of age and species in 90% of the cases, hence

- The number of sample points N required has been estimated using probability proportionate stratified random sampling method.
- Sampling intensity is 0.1%.

II. Linear: The FSI method of using 125m long * 10m wide sample plot was ideal and was adopted, with 1% sampling intensity.



c) Habitations

I. Rural: Villages can best ratified based on the geographical area or population (which is adopted by FSI). Hence,

- Area stratification was adopted since extents were readily available from Satellite imagery.
- The classes adopted were - Area between **5** to **3 Km^2, 3** to **1 Km^2, 1 Km^2** to **50 Ha** and **50 Ha** to **25 Ha** and area less than **25 Ha**.
- 6-10 samples (villages) of **0.1 Ha** in each class were selected using stratified Random Sampling Technique. Enumeration was carried out in each selected sample and extrapolated to entire area.

II. Urban: Area based stratification was adopted similar to rural areas, since extents were readily available from the Satellite imagery.

- The classes adopted were – Area > **50 Km^2**, **50** to **35 Km^2**, **35** to **20 Km^2**, **20** to **10 Km^2**, **10** to **5 Km^2**.
- Habitations were divided into segments by using systematic grid based on the manmade/natural features. Segments were selected at random for carrying out enumeration at 0.1% sampling intensity. Enumeration was carried out in **0.1 Ha** sample plot in the selected segments and extrapolated to entire area.

d) Scattered Trees

Individual trees also contribute substantially towards TOF. Counting the number of trees on screen is cumbersome and could be prone to errors as canopy of individual trees are not differentiable for many species.60 samples plots as suggested by FSI have been selected at random. The sample size adopted was **3 Ha**.



8.4.2. Data Collection

After laying out the plot, the enumeration work was taken up. The information collected was recorded in (2) Forms i.e., Plot Approach/Description Form and (ii) Plot Enumeration Form. The work of data collection commenced in 2009-10 and completed in 2013-14. Sufficient precautions were taken in filling up the forms. On completion of the work in a plot, the crew leader have scrutinized the forms if any information was missing or doubtful, necessary corrective measures taken. The data collected was then uploaded into TOFMIS module of TGFMIS for processing.

8.4.3. Data Processing

A customized online application TOFMIS was developed for entering the data collected in the field forms and also for processing. The hard copy data was sent to IT wing for cross verification. There are 3 stages in Data processing:

- Data checking: The data submitted by field officers was verified by scientists at Geomatics center. If any inconsistency or recording error is found (particularly in dbh and more trees in the plot) necessary steps were taken duly consulting the field officers sought and then the data rectified.
- Calculating volumes for trees: After the completion of the verification of the data, the volume was calculated for each tree by using volume equations provided by FSI and APFD. Then plot volumes also calculated.
- Generation of reports District and Division wise: Using above volumes calculated and extent of areas calculated from CARTOSAT-1 images, The Stratum wise, District wise growing stock, unit volume per hectare, stems per ha and total stems estimated.

8.4.4 Comparison between TOF assessment methods of FSI and TSFD

Item	TOF by FSI	TOF by TSFD
Sampling unit	For assessment of TOF, entire country has been stratified into 14 homogenous physiographic zones. Within each strata few districts are chosen for sampling	District is taken as unit and all the districts are sampled.
Stratification	The area is divided into following strata: Rural Block Linear Scattered Urban	The area is divided into following strata: Natural – 4 Canopy density classes Linear Plantations Block Plantations Rural – 5 classes based on area Urban - 5 classes based on area Scattered – areas don't fall into any of the above class.
Materials and methods	PAN (5.8 m) for some parts and LISS III (23.5 m) for rest	Cartosat-1 Stereo-pair (2.5 m)

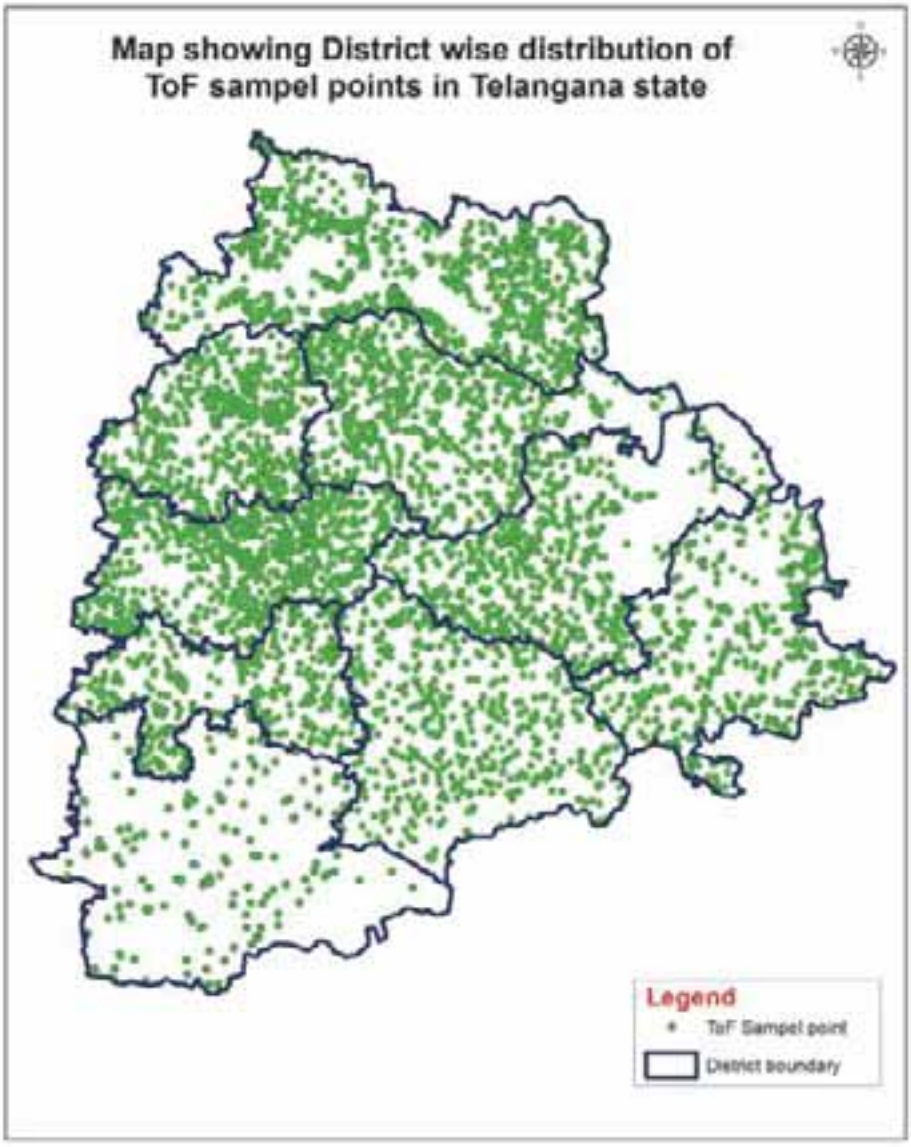
Sampling for various classes		
Natural forests	Clubbed in scattered class	4 density classes - **0.1 Ha** plots with 0.15 sampling intensity
Block plantations	50 samples of **0.1 Ha** each	**0.1 Ha** plots with 0.15 sampling intensity
Linear Plantations	60 plots of 10m x 125m	60 plots of 10m x 125m
Rural	Clubbed with scattered class, since it is difficult to delineate areas on LISS III data	5 classes based on area and 6-10 samples in each class. Total enumeration.
Urban	Sampling unit is Urban Frame Survey (UFS) prepared by National Sample Survey Organization (NSSO).	5 classes based on area. Division of blocks based on permanent features for easy demarcation in the field. Total enumeration in each block.
Scattered	**3 Ha** in non-hilly area and **0.5 Ha** in hilly area.	**3 Ha** for all the areas.

8.5. Interpretation Results

S. no	Stratum	Canopy class	Area in Km^2	No. of Polygons	No.of sample points
Natural Forests					
1	Block	MDF	200.02	3497	220
2		OF	554.61	29151	677
3		Scrub	1440.75	85541	1385
4	Linear		129.87		
	Total		**2325.23**	**118189**	**2282**
Plantations					
1	Block		1784.24	60434	574
2	Linear		198.64	230170	598
	Total		**1982.92**	**290604**	**1172**
Habitations					
1	Rural		67.54	23886	507
2	Urban		39.62	249	497
3	Scattered Tress		2542.21		583
4	**Total**		**2649.37**	**24135**	**1587**
	Grand Total		**6957.52**	**432928**	**5041**

** The notional extents of Habitations are taken as 3.27% of the total extent.*

8.6 Map showing the distribution of Sampling points



8.7. Key Results

a. Tree Cover

Extent of tree cover under various classes is **6957.22Km²**, which comes to 6.21% of the geographical area and details as follows:

Natural Forests	**2325.23 Km²**
Plantations (Block and Linear)	**1982.92 Km²**
Rural Habitations	**67.54 Km²**
Urban Habitations	**39.62 Km²**
Scattered Trees	**2542.21 Km²**

The natural forests, plantations and habitations constitute 33.42%, 28.50% and 38.08% of the total tree cover respectively.

The District and stratum wise details are as follows:

Area in Km^2

District / Stratum	Natural forests		Plantations		Habitations			Total
	Block	Linear	Block	Linear	Rural	Urban	Scattered	
Adilabad	635.59	25.37	53.73	30.65	4.91	1.62	265.08	1016.94
Karim Nagar	335.33	20.46	192.54	33.17	11.02	2.56	278.52	873.6
Khammam	172.16	3.05	472.07	5.22	7.49	2.65	203.58	866.22
Mahaboob Nagar	92.56	5.72	228.05	9.46	9.31	2.27	482.23	829.6
Medak	456.60	43.46	44.69	48.17	6.28	2.13	259.67	816
Nalgonda	88.59	9.75	545.41	18.89	9.92	2.57	402.60	1077.73
Nizamabad	167.79	9.00	8.59	15.24	5.61	2.04	188.82	397.086
RR & Hyderabad	117.56	7.81	134.21	22.79	4.13	20.48	194.00	500.98
Warangal	129.19	5.25	104.95	15.09	8.88	3.29	267.71	534.36
Total	**2195.36**	**129.87**	**1784.24**	**198.68**	**67.55**	**39.61**	**2542.21**	**6957.52**

b. Growing Stock

Overall Growing stock is 21.444 Million Cubic Meters (Mm^3). Breakup is as follows:

- Natural Forests - 8.770 Mm^3
- Plantations - 11.531 Mm^3
- Rural Habitations - 0.085 Mm^3
- Urban Habitations - 0.045 Mm^3
- Scattered Trees- 1.013 Mm^3

The top 10 species based on volume are Mangifera Indica with 8.3956 Mm^3; Azadirachta indica 2.5712 Mm^3; Butea monosperma 1.4733 Mm^3; Tectona grandis 1.1161 Mm^3; Bombax religiosum 0.5048 Mm^3; Tamarindus indica 0.4099 Mm^3; Madhuca indica 0.3584 Mm^3; Acacia nilotica 0.3570 Mm^3; Phoenix sylvestris 0.3265 Mm^3; Eucalyptus camaldulensis 0.2926 Mm^3.

c. Number of Stems

Number of Stems is 44.154 Million (M). Breakup is as follows:

- Natural Forests - 20.451 Million
- Manmade Plantations - 22.258 Million
- Habitations (Rural)-0.093 Million
- Habitations (Urban)-0.066 Million
- Scattered Trees-1.286 Million

The top 10 species based on number of stems are Mangifera indica 16.2573 Million; Tectona grandis 4.0657 M; Azadirachta indica 3.8156 M; Butea monosperma 1.8610 M; Acacia nilotica1.5770 M; Bombax religiosum 1.0724 M; Citrus Pseudolimon 0.8051 M; Eucalyptus camaldulensis 0.7070 M; Lagerstroemia parviflora 0.6675 M; Albizia amara 0.6403 M.

d. Details of Tree Cover and Growing Stock:

I. Natural Forests

This stratum consists of 2 Major classes viz., Block & Linear. Again Block class is sub-divided into - MDF, OF & Scrub. The total GS is 8.770 Mm^3. The total number of stems is 20.451 million.

Stratum	Canopy class	Area in Km^2	Gs (Mm^3)	Unit Gs (m^3/ha)	Stems in Million	Stems/ha in Nos
Natural Forests (Block)	MDF	200.02	0.807	40.353	2.179	109
	OF	554.61	1.959	35.317	5.460	98
	Scrub	1440.75	4.788	33.230	11.150	77
Natural Forests (Linear)		137.05	1.216	88.73	1.162	112
Total		**2332.43**	**8.770**		**20.451**	

ii. Plantations (Block and Linear)

Growing stock in this Stratum is 11.531 Mm^3. Breakup is as follows:

- Block Plantations- 10.878 Mm^3
- Linear Plantations - 0.653 Mm^3

Number of Stems in this Stratum is 22.258 Million. Breakup is as follows:

- Block Plantations- 21.682 Million
- Linear Plantations- 0.576 Million

Volume/ha & Total Volume; No. of Stems/ ha & Total No. of stems:

S. no	Stratum	Area in Km^2	GS (Mm^3)	Unit GS (m^3/ha)	Stems in Million	Stems/ha in No's
1	Block Plantations	1784.24	10.878	60.96	21.682	126
2	Linear Planitations	198.68	0.653	106.11	0.576	108
	Total	**1982.92**	**11.531**		**22.258**	

iii. Rural Habitations:

The GS of this stratum is estimated as 85137.91$m^3$and the total number of stems is 93391. The unit volume is 12.60 m^3/ Ha and stems per ha is 13.83.

iv. Urban Habitations :

The total volume of this stratum is 45510.44m^3. The unit volume is 11.49 m^3/ Ha. The total number of stems are 65791 and stems per Ha 16.61 The notional area of this stratum is covering 0.57% of total TOF area.

v. Scattered Trees:

The total volume of this stratum is estimated as 1.013Mm^3 and unit volume is 3.98m^3/ Ha. The total trees are 1.286 Million and stems/ Ha 5.06.



8.8 Other Results

I. Potential areas for taking up plantations:

a. Linear plantations along the roads:

Length in Km

District / Stratum	Length of roads			Length already covered with plantations			Roads length available for plantations		
	NH	SH	Others	NH	SH	Others	NH	SH	Others
Adilabad	290.20	301.4	21546.0	84.3	85.2	197.4	205.9	216.2	21348.6
Karim Nagar	135.3	221.9	16993.0	55.1	47.4	130.0	80.2	174.5	16863.0
Khammam	24.3	553.7	14476.0	3.2	49.8	504.0	21.1	503.9	13972.0
Mahaboob Nagar	162.0	714.7	27582.0	1.9	33.3	1314.0	160.1	681.4	26268.0
Medak	178.3	354.5	16089.0	28.6	120.7	1872.0	149.7	233.8	14217.0
Nalgonda	201.0	508.5	24422.0	23.9	52.9	1026.0	177.1	455.6	23396.0
Nizamabad	177.6	272.9	9744.3	27.4	48.4	625.4	150.2	224.5	9091.9
RR & Hyd	59.7	329.7	13957.0	5.9	55.9	1000.8	53.8	273.8	12956.2
Warangal	179.0	145.7	17824.0	22.8	51.0	773.9	156.2	94.7	17050.1
Total	**1407.4**	**3403.0**	**162633.3**	**25.3.1**	**544.6**	**7470.5**	**1154.3**	**2854.4**	**155162.8**

b. Linear plantations along the Streams, canals and Railway Tracks:

Description / District	Railway Track in Km			Rivers and Streams in Km			Canals in Km		
	Total Length	With Trees	Available for Plantations	Total Length	With Trees	Available for Plantations	Total Length	With Trees	Available for Plantations
Adilabad	118.5	9.7	**108.8**	1459.9	10.5	**1449.4**	149.0	4.2	**144.8**
Karim Nagar	87.8	9.0	**78.8**	4722.0	289.0	**4433.0**	375.0	27.0	**347.0**
Khammam	90.0	3.2	**86.8**	3951.0	59.4	**3891.6**	341.7	3.7	**338.0**
Mahaboob Nagar	207.0	1.6	**205.4**	1454.9	10.5	**1444.4**	114.6	0.1	**114.5**
Medak	118.5	13.4	**105.1**	203.9	1.7	**202.2**	52.2	1.6	**50.6**
Nalgonda	228.9	2.6	**226.3**	1459.9	10.5	**1449.4**	149.0	4.2	**144.8**
Nizamabad	102.7	2.5	**100.2**	255.6	7.8	**247.8**	139.2	7.2	**132.0**
RR & Hyd	297.4	3.6	**293.8**	1454.9	10.5	**1444.4**	114.6	0.1	**114.5**
Warangal	219.6	0.9	**218.7**	5387.1	121.3	**5265.8**	91.8	4.8	**87.0**
Total	**1470.4**	**46.5**	**1423.9**	**20349.2**	**521.2**	**19828.0**	**1526.1**	**52.9**	**1473.2**





Glossary of Technical Terms

Allowable Error: A systemic error that is 'acceptable', both statistically and analytically. The amount of error that can be tolerated without invalidating the usefulness of the analytic result.

AWiFS: Advanced Wide Field Sensor.

Band: A wavelength interval in the electromagnetic spectrum. For example, in IRS images the bands designate specific wavelength intervals at which images are acquired.

Calibration: Process of comparing an instrument's measurements with a standard.

Classification: Process of assigning individual pixels of an image to categories, generally on the basis of spectral reflectance characteristics.

Classification accuracy: The extent to which a manual or automatic processing system correctly identifies selected classes.

Color Composite Image: Color image prepared by projecting individual black-and-white multi-spectral images, each through a different color filter. When the projected images are superposed, a color composite image results.

Confidence Interval: A confidence interval (CI) is a particular kind of interval estimate of a population parameter. Confidence intervals are used to indicate the reliability of an estimate. How likely the interval is to contain the parameter is determined by the confidence level or confidence coefficient. Increasing the desired confidence level will widen the confidence interval, however the estimated value will be away from the absolute value.

Consumer's accuracy: It is a measure of the reliability of an output map generated from a classification scheme. It is a statistic that can tell the user of the map what percentage of a class corresponds to the ground-truthed class.

Contrast: The ratio between the energy emitted or reflected by an object and its immediate surroundings.

Contrast enhancement: Image-processing procedure that improves the contrast ratio of images. The original narrow range of digital values is expanded to utilize the full range of available digital values.

Contrast ratio: On an image, the ratio of reflectance's between the brightest and darkest parts of an image.

Contrast stretching: Expanding a measured range of digital numbers in an image to a larger range, to improve the contrast of the image and its component parts.

Density slicing: Process of converting the continuous gray tones of an image into a series of density intervals, or slices, each corresponding to a specific digital range. The density slices are then displayed either as uniform gray tones or as colors.

Digital Image Processing: Computer manipulation of the digital-number values of an image.

Digital Number (DN): Value assigned to a pixel in a digital image

Error Matrix: A matrix or table that displays statistics for assessing image classification accuracy by showing the degree of mis classification among classes.



Errors of Commission: Pixels incorrectly assigned to a particular class that actually belong in other classes.

Errors of Omission: Pixels incorrectly excluded from a particular class.

False color image: An image produced by displaying multiple spectral bands as colors different from the spectral range they were taken in. A color image where parts of the non-visible EM

spectrum are expressed as one or more of the red, green, and blue components, so that the colors produced by the Earth's surface do not correspond to normal visual experience. Also called a false color composite (FCC). The most commonly seen false-color images display the very-near infrared as red, the red as green, and the green as blue.

Forest: Land with tree crown cover (or Equivalent stocking level) of more than 10 % and area of more than 0.5 ha. The trees should be able to reach a minimum height of 5 m at maturity in situ. May consist of either closed forest formations where trees of various storeys and undergrowth cover a high proportion of the ground, or open forest formations with a continuous vegetation cover, in which tree crown cover exceeds 10 %. Young natural stands and all plantations established for forestry purposes which have yet to reach above criteria are included under forest, as are areas normally forming part of the forest area which are temporarily un stocked as a result of human intervention or natural causes but which are expected to revert to forest.

Forest Canopy Density: Forest Canopy Density (FCD) refers to the proportion of an area in the field/ground that is covered by the crown of trees and is expressed in percentage of the total area.

Forest Type: Forest type is defined as a unit of vegetation which possess broad characteristics in physiognomy and structure sufficiently pronounced to permit its differentiation from other such units (Champion & Seth 1968)

Geographic Information System (GIS): A computer based system for capturing, storing, manipulating, analyzing and displaying data, which are spatially referenced to the earth.

Global Positioning System (GPS): The Global Positioning System (GPS) is a space-based global navigation satellite system. It provides reliable positioning, navigation, and timing services to worldwide users on a continuous basis in all weather, day and night, anywhere on or near the Earth which has an unobstructed view of four or more GPS satellites.

Good Forest and Degraded Forest: Good Forest includes VDF, MDF and OF; degraded forest includes Scrub and Non-Forest.

Green and Barren: Green includes VDF, MDF, OF and Scrub; Barren includes Non-Forest.

Ground control point (GCP): A geographic feature of known location that is recognizable on images and can be used to determine geometric corrections.

Ground truth: Information acquired by field study for the purpose of calibration and/or verification of remotely sensed data.

Geometric correction: Image-processing procedure that corrects spatial distortions in an image. The geographic correction of image data to conform to a map projection.

Histogram: A means of expressing the frequency of occurence of values in a data set within a series of equal ranges/bins, the height of each bin representing the frequency at which values in the data set fall within the chosen range. A cumulative histogram expresses the frequency of all values falling within a



bin and lower in the range. A smooth curve derived mathematically from a histogram is termed as probability density function (PDF).

Image: A pictorial representation acquired in any wavelength of the electromagnetic spectrum. Although image is a general term, it is commonly restricted to representations acquired by non-photographic methods.

Imagery: The products of image forming instruments.

Interpretation: The process in which a person extracts information from an image.

Interpretation key: Characteristic or combination of characteristics that enable an interpreter to identify an object on an image.

Kappa coefficient: A statistical measure of the agreement, beyond chance, between two maps (e.g. output map of classification and ground-truthed map). It is represented by the symbol kappa hat or Khat.

Mangroves: Salt tolerant ever green forest ecosystem found mainly in tropical and sub – tropical coastal and / or inter tidal regions.

Medium Dense Forest: All lands with forest cover having a canopy density between 70-40%

Multi-spectral classification: Identification of terrain categories by digital processing of data acquired by multi-spectral scanners.

Multi-spectral scanner: Scanner system that simultaneously acquires images of the same scene at different wavelengths.

Mid-infrared (MIR): The range of EM wavelengths from 8 to 14 micrometers dominated by emission of thermally generated radiation from materials; also known as thermal infrared.

NDVI: The Normalized Difference Vegetation Index (NDVI) is defined as the ratio of the difference in the NIR & Red radiance values to the sum of the NIR & Red radiance values.

NDWI: The Normalized Difference Water Index (NDVI) is defined as the ratio of the difference in the SWIR and NIR radiance values to the sum of the SWIR and NIR radiance values.

Near infrared (NIR): The shorter wavelength range of the infrared region of the EM spectrum, from 0.7 to 2.5 m. It is often divided into very-near infrared (VNIR) covering the range accessible to photographic emulsions (0.7 to 1.0m), and the short wavelength infrared (SWIR) covering the remainder of the NIR atmospheric window from 1.0 to 2.5m.

Noise: Random or repetitive events that obscure or interfere with the desired information.

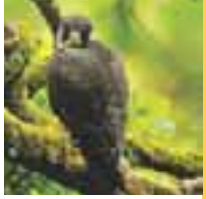
Open Forest: Lands with forest cover having a canopy density between 40 to 10%.

Overall accuracy: The percentage of correctly classified pixels. It is a good measure of the accuracy of a classification scheme as it is not biased towards the smaller classes.

Path and Row: Path is an approximate specific orbital track of a Satellite which may vary due to drift and other factors. Row refers to the latitudinal center line of a frame of imagery.

Pixel: Contraction of picture element

Producer's accuracy: A measure of the accuracy of a particular classification scheme. It shows what percentage of a particular ground class was correctly classified.



Protected Forest (PF): An area notified under the provisions of the Indian Forest Act or other State Forest Acts, having limited degree of protection. In protected forest all activities are permitted unless prohibited.

Radiometric correction: Calibration of recorded radiance values reflected from (or emitted by) the ground scene.

Radiometric Resolution: The expected spread of variation in each estimate of scene reflectivity as observed in an image. Smaller radiometric resolution is "better". Radiometric resolution for a given image may be improved by averaging, but at the cost of spatial resolution.

Raster format: A means of representing spatial data in the from of a grid of DN, each line of which can be used to modulate the lines of a video raster.

Ratio image: An image prepared by processing digital multi-spectral data as follows: for each pixel, the value for one band is divided by that of another. The resulting digital values are displayed as an image.

Remote sensing: Collection and interpretation of information about an object with an instrument without being in physical contact with the object.

Reserved Forests (RF): An area so constituted under the provisions of the Indian Forest Act or other State Forest Acts, having full degree of protection. In Reserved forests all activities are prohibited unless permitted.

SAVI: Soil-Adjusted Vegetation Index. A vegetation index that accounts for, and minimizes, the effect of soil background conditions.

Scene: As the satellite moves along its path, the observatory instruments are continuously scanning the terrain below. The instrument signals are transmitted to Earth and correlated with telemetry ephemeris data to form individual framed images. During this process, the continuous data are segmented into individual frames of data known as scenes

Scrub: Degraded forest lands having canopy density less than 10% and areas with dwarf and stunted growth.

Spatial resolution: Ability to separate closely spaced objects on an image or photograph. A measure of the smallest angular or linear separation between two objects usually expressed in radians or meters.

Spectral resolution: The ability of a sensing system to resolve or differentiate electromagnetic radiations of different frequencies.

Standard Deviation and Variance: In probability theory and statistics, the variance of a random variable or distribution is the expected, or mean, value of the square of the deviation of that variable from its expected value or mean. Thus the variance is a measure of the amount of variation within the values of that variable, taking account of all possible values and their probabilities or weightings (not just the extremes which give the range).

The standard deviation of a statistical population, a data set, or a probability distribution is the square root of its variance. Standard deviation is a widely used measure of the variability or dispersion.

Statistic: A statistic is a single measure of some attribute of a sample (e.g. its arithmetic mean



value). It is calculated by applying a function (Statistical algorithm) to the values of the items comprising the sample which are know together as a set of data. A Statistic as a function of a sample where the function itself is independent of the sample's distribution; that is, the function can be stated before realization of the data. The term statistic is used both for the function and for the value of the function on a given sample.

Stereo pair: Two overlapping images or photographs that may be viewed stereoscopically.

Supervised classification: Digital-information extraction technique in which the operator provides training-site information that the computer uses to assign pixels to categories

Tone: Each distinguishable shade of gray from white to black on an image

Training area: A sample of the Earth's surface with known properties; the statistics of the imaged data within the area are used to determine decision boundaries in classification.

Training site: Area of terrain with known properties or characteristics that is used in supervised classification.

Tree: A woody perennial with a single main stem, or in the case of coppice with several stems, having a more or less definite crown, having diameter 10 cm or more at breast height (1.37m). If there are stems below 1.37 m height then individual branch/stem which has attained 10 cm DBH will be considered as individual tree. It also includes bamboo, palms, coconut, neem, peepal, fruit trees etc.

Unsupervised classification: Digital information extraction technique in which the computer assigns pixels to categories with no instructions from the operator.

Vegetation Canopy: The layers of vegetation above the level of the ground, formed by the leaves of the plants.

Very Dense Forest: All lands with forest cover having a canopy density more than 70%

Visible radiation: Energy at wavelengths from 0.4 to 0.7mm that is detectable by the human eye.





Geomatics Team



M. Prudvi Raj IFS,
APCCF (Wild Life)



Sunil Kumar Gupta, IFS,
APCCF (IT & WP)



P. Sreenivas Rao
DCF (FCA & IT)



M. Rajeshwar Reddy
Proj. Scientist - E



B. Ramakrishna
Proj. Scientist - E



K. Bhaskar
Proj. Scientist - E



K. Rajshekhar Reddy
Proj. Scientist - E



A. J. Sheeba
Proj. Scientist - D



K. Sravani
Proj. Scientist - D



A. Kavitha
Proj. Scientist - C



G. Krishna Prasad
Proj. Scientist - B



G. Deepthi Reddy
Proj. Scientist - E



L. Kavitha
Proj. Scientist - B



M. Vamsikrishna Reddy
Proj. Scientist - B



The Report says...

Environmental changes rapidly alter the dynamics of terrestrial vegetation, with consequences on the functioning of the Earth system and provision of ecosystem services is a global concern. Forest cover is one of the important parameter in assessing the status of vegetation which is an indirect parameter reflecting the environmental change. Monitoring of forest cover is an essential tool for sustainable management of natural resources. Woody green cover can better maintained and managed by identification of forest gaps and their subsequent refilling. Forest canopy density mapping is one of the tools used to identify such canopy openings and most useful parameter to consider in the planning and implementation of afforestation and reforestation program. To know forest canopy density, recourse is taken to satellite image interpretation. Telangana has 24% notified forests, out of which 61.34 % area covered with forests of more than 0.1% canopy density. Apart from this there is 6.48% forest cover with more than 0.1 canopy density (**5524 Km^2**)including the manmade plantations outside the notified forests of **85198 Km^2**. We therefore must conserve the existing cover and measure the greening happening inside and outside notified forests.

This is the second annual report of Telangana showing the existing situation of forest cover and how we are moving. A truthful picture of forest growth and drain is published after a year of hard work, and it is hoped, it shall guide the Telangana Forest Department appropriately in achieving the national objectives by selecting suitable areas inside notified forest areas for raising plantations and for watershed development under **Telangana Ku Haritha Haram** and other developmental programmes.