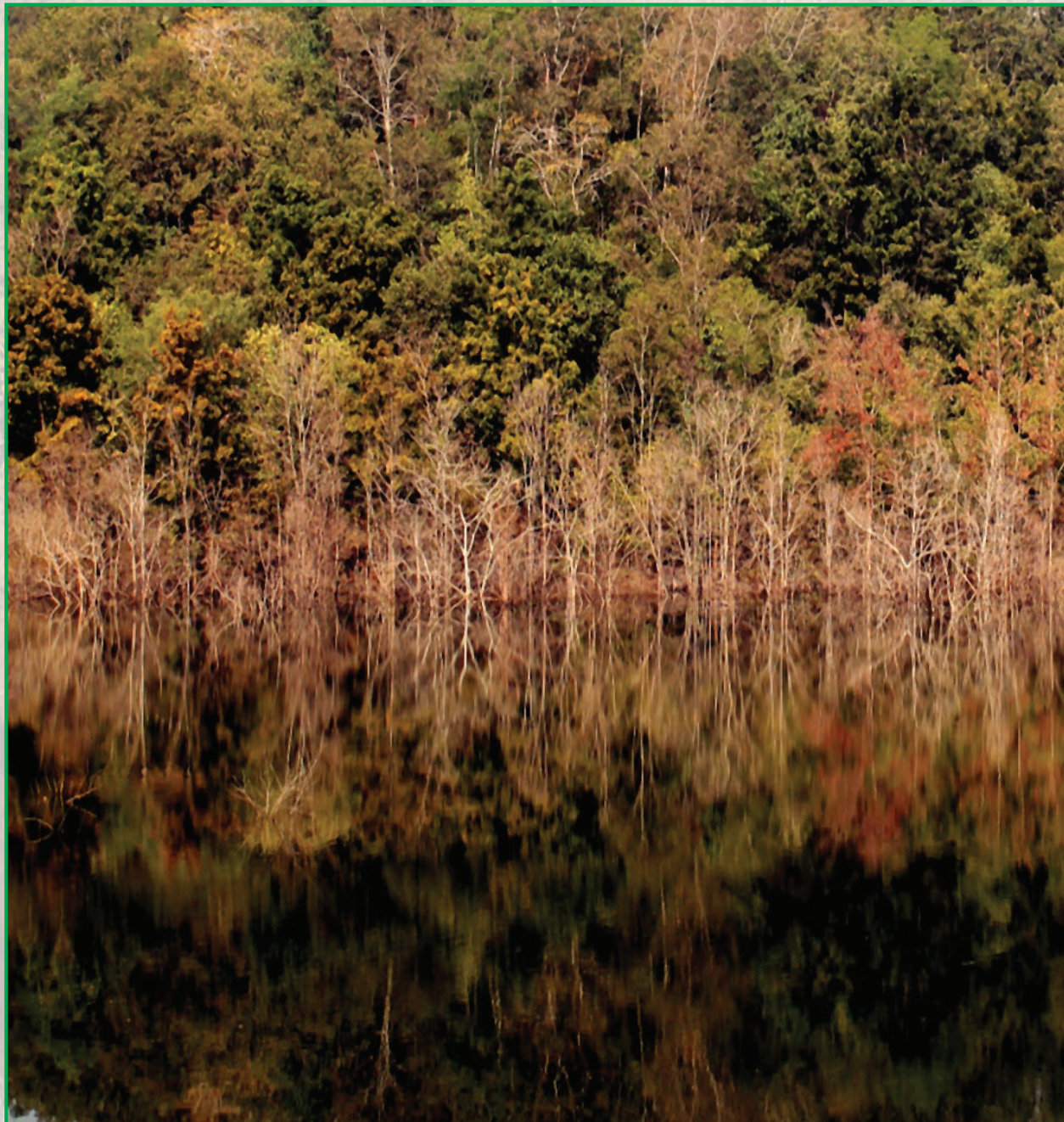


# **ANDHRA PRADESH STATE OF FOREST REPORT 2014**



**Andhra Pradesh Forest Department  
Government of Andhra Pradesh  
Hyderabad**

## ***Andra Pradesh State of Forest Report-2014***

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AP Forest Department

Aranya Bhavan, Saifabad, Hyderabad - 500 004.

Tel:404-23231487, Fax:040-23240541

Website : [www.forest.ap.nic.in](http://www.forest.ap.nic.in)

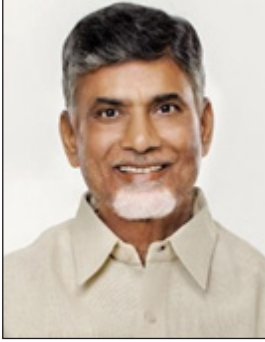
[www.apforest.gov.in](http://www.apforest.gov.in)

[www.apfdgis.com](http://www.apfdgis.com)

[www.apfmis.com](http://www.apfmis.com)

Email : [apccf\\_it\\_apfd@ap.gov.in](mailto:apccf_it_apfd@ap.gov.in)





**Shri. Nara Chandrababu Naidu**  
Hon'ble Chief Minister  
Government of Andhra Pradesh

### MESSAGE

Date: 11.12.14

It gives me immense pleasure that the Andhra Pradesh Forest Department is bringing out "State of Forest Report Andhra Pradesh 2014". This is the 1st report in the new Andhra Pradesh State and I am confident that it will be useful to not only practicing foresters but also to all those who are well disposed towards conservation of Forests and Wildlife. The report highlights the Forest areas which have been subjected to growth as well as degradation during the past one year with precise geographical locations. This will greatly help in formulating strategy for protection and management of Forests and Wildlife using modern technology.

Forests are the most valuable natural resources available to mankind. Due to the excessive dependence of man on these resources, the forests have become highly vulnerable to exploitation and degradation. For this reason we need to evolve effective strategies to reduce the pressures on the forests and to conserve nature along with its diverse flora and fauna for this generation and for posterity.

The forests apart from meeting the basic needs of the local communities have an important role in maintaining ecological balance, controlling soil erosion and fighting pollution. Across the entire globe, there is a pressing need to seriously take up Conservation and development of forests to face the challenges of climate change, global warming, depletion of ozone layer, etc.

It is very encouraging to note that Andhra Pradesh is the only state in the country, which has brought out annual "State of Forest Report" using LISS III data of Indian Remote Sensing Satellites.

I congratulate the Prl. Chief Conservator of Forests (HoFF) and his entire team for bringing out this excellent and useful report.

(Nara Chandra Babu Naidu)



**Sri B. Gopala Krishna Reddy**  
Environment & Forests, Science &  
Technology, Cooperation

Room No.403, 4th Floor 'J' Block,  
A.P. Secretariat, Hyderabad-500004  
Off: Ph 040-23450633  
Resi: Ph 040-23542998  
Mobile: 9849000567

### MESSAGE

Date: 11.12.14

In the recent years, we all are witness to the various adverse changes taking place in our environment and climate including climate change, pollution, etc. This is mainly due to deforestation and loss of biological diversity. Forests are most important natural resources to maintain ecological equilibrium as they keep in check the adverse changes in environment and climate. Forests are also the habitat for the majority of plant and animal species.

All the countries in the world over are concerned about the environmental degradation and loss of Biodiversity which are resulting in climate change and other adverse phenomena. It is globally recognized that, every country has the responsibility to put a stop to environmental degradation and save all the species of life on earth from the threat of extinction. For this, collecting scientific data on the levels of degradation location wise is very important so that immediate and effective remedial measures can be taken up.

The "Andhra Pradesh State Forest Report 2014" brought out by Andhra Pradesh Forest Department determines the loss and gain of our biological resources using satellite technology almost in real-time. It gives information on the quality of forests and the changes taking place at specific sites. This can be used to formulate conservation strategies.

I feel happy that such a report is brought out every year by AP Forest Department and hope that this publication will help every forester, planner and wildlife enthusiast of the country in planning ahead for conservation of nature with its varied life forms.

I congratulate the Andhra Pradesh Forest Department for the good work done.

**(B.GOPALA KRISHNA REDDY)**





**S.P. Singh, I.A.S.,**  
Principal Secretary to Government

Environment, Forest, Science and  
Technology Department  
Government of Andhra Pradesh  
A.P. Secretariat, Hyderabad-500022  
Phone : 040-23455030, Fax: 040-23452835

### MESSAGE

Date: 11.12.14

The existence and wellbeing of human beings, especially people living in rural areas is closely linked to the health of the forests around them. The State of Andhra Pradesh has 36917.73 Sq.Kms of forests which is 22.62% of its total geographical area. The forests of Andhra Pradesh are blessed with a rich Biodiversity. The state is home for diverse flora and fauna inhabiting varied ecosystems ranging from semi evergreen forests, moist deciduous, dry deciduous, coastal mangroves, and fresh water to brackish water ecosystems. There are 3 National parks and 13 Wild life sanctuaries in the state.

The study of quality of forests and the changes in the forests ecosystem on year to year basis and documenting the result of the studies is an essential tool in formulating management and conservation strategies. The knowledge on availability of forests and their distribution in the vast forest tracts of the state will help in proper planning and fixing the priorities in the planned development of forests of our state.

I am happy to learn that the A.P. Forest Department is bringing out "Andhra Pradesh State Forest Report 2014" highlighting the changes in forest cover in the state between 2011-2012. It is the first such report in Andhra Pradesh after division of the state. I am sure this report will be very useful to practicing foresters environmentalists and conservationists in planning and implementing conservation strategies.

I congratulate the Prl. Chief Conservator of Forests and his team of IT wing who have worked hard to bring out such an important report.

  
(S.P.SINGH)

## FOREWORD



The Honorable Prime Minister of India has proclaimed Digital India as a goal of the Government. Initiative like e-Governance, e- Kranthi and presently g-Governance have become latest slogans for transparency and universal access to data by the citizens. The Andhra Pradesh Forest Department has tried to proceed in tune with IT policy of the Government of Andhra Pradesh and Government of India.

The initiative to critically scan the satellite pictures of the notified forests in Andhra Pradesh Forest Department is in tune with the stress of Honorable Prime Minister of India and Honorable Chief Minister of Andhra Pradesh to utilize the spatial Technology for development. The use of GPS/GNSS to demarcate the forest boundaries is another step to use spatial Technology for converting the boundaries to absolute coordinates called Latitudes & Longitudes. The IT wing has taken pains to critically examine the Satellite images of LISS III and disseminate online changes to field staff and public in a transparent way. The online disseminated points have been ground truthed and the Annual report is finalized.

I congratulate the APCCF (IT) and his entire team for their effort in bringing out the report which will help protection and planning for development of forests and wild life.

A handwritten signature in black ink, appearing to be 'N. J. Singh'.

**Prl. Chief Conservator of Forests (HoFF)**  
Andhra Pradesh



## PREFACE



This is the 5<sup>th</sup> attempt to publish the Andhra Pradesh State of Forests Report and first after bifurcation using satellite data of LISS III sensor having 23 mt resolution.

The technology is fast changing and within a span of 42 years from 1972, the satellite pictures have clearly entered the domain of aerial photography. The World view – 3 launched during 2014 gives a resolution of 30 cms. In coming days, the forester will be put to serious scrutiny of his works like Plantations, Fire lines, Percolation tanks, Check dams, Buildings, Roads and even thinning and other operations. The 3D image streaming of high resolution satellite data by software like Skyline will open up new vistas for Protection & Planning.

In the field of forest fire monitoring the advent of latest satellite like SUOMI NPP (National Polar orbiting Partnership) higher spatial and radiometric capabilities shall give us better fire predictions.

There is greater stress by Honorable Prime Minister and our beloved Chief Minister on use of spatial Technology & e- Governance. The increasing constellation of Chinese Compass, European Galileo apart from Russian and American global positioning systems shall enhance accuracy of GNSS coordinates. In near future all forest lands shall be geo referenced by precise co-ordinates to enhance their Protection and Surveillance. Let us hope that the future shall see a better environment with green forests and abundant Wildlife.

The book has chapters on Introduction, Methodology, Forest fire and Mangroove. There is both growth and drain. The results are highly reliable having been ground verified and online feedback received. Certainly the book shall assist Andhra Pradesh Forest Department to do better in time to come.

A handwritten signature in black ink, with the date '23/12/14' written below it.

**Dr.H.C.Mishra,IFS,  
Adl.PCCF(IT).**

## Acknowledgements



This State of Forest Report 2014 compares LISS III images of IRS P6 satellite of 2012 with 2011. This is the fifth such annual report and 1st report in the residual Andhra Pradesh, which brings out the changes both positive and negative, in real time.

Bringing out a detailed mapping and delineating changes in forest cover in the mapped forests of Andhra Pradesh on annual basis is a herculean task and support and guidance of the Head of the Department is crucial in this. I gratefully acknowledge the guidance and encouragement given by Sri. B.S.S.Reddy, IFS, earlier PCCF(HoFF) and Sri.A.V.Joseph ,IFS,PCCF(HoFF) in this regard.

Dr.H.C.Mishra, APCCF (IT) led the team from front and took serious pains in day to day guidance right up to going through the entire manuscript himself. His continuous encouragement in bringing out a correct report is sincerely acknowledged.

The valuable direction and guidance of the Technical Advisory Committee on the Geomatics consisting of Dr.Devender Pandey, IFS(Retd), former Director General, FSI, Dehradun; Dr.S.V.Reddy, Dy.Director Biosphere Reserves, MOEF,GOI, New Delhi; Dr.C.S.Jha, Head, Forest and Ecology Division, NRSC, and Dr.G.Prasad RAO, scientist-E,APSRAC, Hyderabad are sincerely acknowledged. Their suggestions have helped to improve the SFR to a great extent.

Dr. A.Ramamurthy, ACF (RS) has contributed immensely in shaping up the report and the same is placed on record. Contributions of Smt. J.P.Sowjanya, FRO (GIS), Smt.CH.Deepa, FRO(GIS) and Sri. S.Srinivasulu, FRO (RS) in guiding the project scientists in image processing and analysis, change polygonisation and also in ground truthing, correcting and compilation of APSFR-2014 are sincerely acknowledged.

Geomatics team of the project scientists consisting of Sri.M.Rajeswar Reddy, Sri K. Bhaskar Rao, Sri K. Rajashekar Reddy, Sri B. Ramakrishna, Smt A.I. Sheeba, Sri.Rajendra, Sri.A. Srinivasa Rao, Smt.Reeja sundaram, Smt D. Kavitha, Sri Ashwin Kumar, Smt K.Anuradha, Miss K.Sravani, Miss Deepthi, Sri Y.VVDS Chakradhar Rao, Sri B. Pavan Kumar, Sri G.Krishna Prasad, Sri.Anantha chari, Smt.Mounika, Smt.Poornima, Miss.Manorama, Sri. P.V.satish, Sri.Vamsi Krishna Reddy,Sri.G.Venu, Miss.L.Kavitha ,Miss Usha Rani and Sri.Srinivasulu has worked very hard to bring out this report. The team had sincerely worked right from data browsing, Geo-referencing, interpretation and detection of change polygons, ground truthing and report preparation without which the report could not have been brought out. Hence their contribution is sincerely acknowledged.

The ground level officers up to ABO level have taken pains in ground verification and furnished feedback, without which this high level accuracy report could not have been possible.

At the end I acknowledge all the colleagues and other staff in the Head Office and the field officers for their valuable contribution in bringing out this publication.

A handwritten signature in black ink, appearing to be 'Ratnaker Jauhari'.

**Ratnaker Jauhari, IFS,**  
CCF(IT)



## CONTENTS

### Executive summary

#### I. Introduction

1. About the state 2
2. History of Geomatics in AP Forest Department 2
3. History of Forest Cover Change Monitoring in AP 3-4

#### II. Methodology

1. Satellite data and its period 5
2. Technical Advisory Committee 5-6
3. Image processing Technique adopted 6-7
4. Limitations of Technology 7
5. Accuracy Assessment 7
6. Cost and Time of bringing out APSFR 2014 7-8

#### III. Statewide Results and Analysis

1. Introduction 9
2. Recorded Forest area 9
3. Protected area 10
4. Community Forest Management 10
5. Forest Cover 10-11

#### IV. Forest Division Wise Results

- |                   |       |                  |       |                        |        |
|-------------------|-------|------------------|-------|------------------------|--------|
| 1. Ananthapur-    | 17-21 | 9. Kurnool-      | 50-52 | 17. Srikakulam-        | 79-82  |
| 2. Chittoor West- | 22-26 | 10. Nandyal-     | 53-55 | 18. Vizianagaram-      | 83-86  |
| 3. Atmakur WLM-   | 27-29 | 11. Proddutur-   | 56-59 | 19. Vishakhapatnam-    | 87-90  |
| 4. Markapur WLM-  | 30-33 | 12. Eluru-       | 60-63 | 20. Chittoor East WLM- | 91-4   |
| 5. Giddalur-      | 34-37 | 13. Kakinada-    | 64-68 | 21. Tirupati WLM-      | 95-98  |
| 6. Guntur-        | 38-41 | 14. Krishna-     | 69-71 | 22. Rajampet WLM-      | 99-101 |
| 7. Nellore-       | 42-46 | 15. Narsipatnam- | 72-75 |                        |        |
| 8. Kadapa-        | 47-49 | 16. Paderu-      | 76-78 |                        |        |

#### V. Forest Cover Statistics in Protected Areas

1. Introduction 102
2. Protected Area Network in AP 102
3. Forest Cover in Protected Areas 102-103

#### VI. Forest Cover Statistics in Joint Forest Management Area

1. Introduction 104
2. Numbers & Area under VSSs 104
3. Forest Cover in VSS Areas 104-105

#### VII. Forest Fire in Andhra Pradesh

1. Introductions 106
2. Forest Fire Losses 106-108
3. Forest Fire Pattern in Andhra Pradesh 108-112

#### VIII. Mangrove Forests in Andhra Pradesh

1. Introduction 113
2. Flora and Fauna 113
3. Threats 113
4. Mangroves in Andhra Pradesh 113-114
5. Importance of Mangroves 114
6. Forest cover changes in mangroves inside notified blocks 114
7. Analysis of the results 115

#### Glossary of Technical Terms

# ABBREVIATIONS

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





## Executive Summary

“The Andhra Pradesh State of Forest Report” gives a detailed view of the health of notified forests in the State on annual basis. State Forest Report 2014 is the fifth report in the series. It gives precise locations of the forest cover changes, assessed using LISS III data of 2011 & 2012 seasons up to compartment level. It shows that forest cover has depleted inside notified forests of Andhra Pradesh during the period. **The changes have been streamed on line and near cent percent verification is done, which gives high authenticity to the results.** The following are the key results of this assessment:

### Key Results:

1. The state had 651.25 Km<sup>2</sup> of Very Dense forest, 11814.23 Km<sup>2</sup> Moderately Dense forest & 10944.21 Km<sup>2</sup> Open forest in 2011 and corresponding figures in 2012 are 651.25 Km<sup>2</sup> of VDF, 11810.20 Km<sup>2</sup> MDF, 10938.50 Km<sup>2</sup> Open forest.
2. There is a net reduction of 4.03 Km<sup>2</sup> in MDF and 5.71 Km<sup>2</sup> in Open forest during 2011-2012. There is net loss of 19.10 Km<sup>2</sup> during this period including 9.36 km<sup>2</sup> scrub forest
3. There is degradation of forests from higher canopy density class to lower canopy density class in an extent of 43.24 Km<sup>2</sup>. Of this, 12.39 Km<sup>2</sup> of forest is lost due to fresh encroachments and 25.70 Km<sup>2</sup> due to clearance of jungle growth for raising of plantations, 4.11 Km<sup>2</sup> due to harvesting of matured plantations and 0.67 Km<sup>2</sup> due to diversion of forest land for non-forestry purposes. There is a loss of 0.36 Km<sup>2</sup> due to failure of plantations and fire accidents.
4. There is Positive change in an area of 27.30 Km<sup>2</sup>.
5. 3.31 Km<sup>2</sup> of MDF, 8.85 Km<sup>2</sup> of Open forest and 25.31 Km<sup>2</sup> of Scrub forest has been converted into Non-forests during the period.
6. As negative change in forest cover due to clearance of jungle growth for raising of plantations and harvesting of plantations is only a management intervention, the same is not considered as permanent loss of forest cover. Hence, **the net loss of forest cover** by encroachment during this period is **12.39 Km<sup>2</sup>**.
7. **Protected Areas** account for 0.20 Km<sup>2</sup> of encroachments.
8. **Most negative change** due to encroachments of 4.51Km<sup>2</sup> was found in Rajahmundry Circle followed by Visakhapatnam Circle with 2.33 Km<sup>2</sup> and Guntur Circle with 2.05 Km<sup>2</sup> and Ananthapur Circle showed the least negative change due to encroachments of 0.55 Km<sup>2</sup>.
9. **Encroachments** were noticed in 18 Divisions of the state including the Khammam part which is included in the residuary Andhra Pradesh. The Divisions contributing most negative changes due to encroachments are: Giddalur (1.75 Km<sup>2</sup>), Kakinada (1.18 Km<sup>2</sup>), Markapur (1.08 Km<sup>2</sup>), Eluru (1.05 Km<sup>2</sup>) and Paderu (1.03 Km<sup>2</sup>).
10. **No changes** were found in 02 Divisions, viz., Atmakur, Kurnool.
11. **Net positive change** was found in 04 Divisions, i.e., Markapur (0.29 Km<sup>2</sup>), Chittoor East (2.50 Km<sup>2</sup>), WLM- Tirupathi (2.67 Km<sup>2</sup>) and Nandyal (5.75 Km<sup>2</sup>).
12. Though there are a lot of plantations taken up for improving vegetation cover and growing stock, they are not discernible as to their growth in most cases. This is resulting towards loss of forest cover.



# Chapter-I

## Introduction

### 1.1 About the state

Andhra Pradesh became the 8<sup>th</sup> largest state in India, geographical area wise; with an area of 162440.Km<sup>2</sup> \* after the Andhra Pradesh Reorganisation Act, 2014. Telangana state comprising 10 districts from north-western Andhra Pradesh became 29<sup>th</sup> state of India. The new state of Andhra Pradesh and Telangana came into existence on 2<sup>nd</sup> June 2014.

Andhra Pradesh is bordered by Telangana in the northwest, Chhattisgarh and Odisha in the north, the Bay of Bengal in the east, Tamil Nadu in the south and Karnataka in the west.

Andhra Pradesh has 36,914.7 Km<sup>2</sup> \* of notified forest land, which is 22.73% of the Geographical area. The population of the state is 49.66 million (2011 census) which occupies 10<sup>th</sup> place in the country.

### 1.2 History of Geomatics in AP Forest Department

Prior to 1996 there was no mechanism to monitor the Forest cover changes in Andhra Pradesh. It used to rely on the data given by the Forest Survey of India, Dehradun through its bi-ennial “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 which is under the control of forest Department and outside separately. It presented a nationwide & state wise picture of the green cover, inclusive of the areas outside the notified forests. These provide data only up to 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, up to the smallest unit of administration, i.e. Beat level and Compartment level. This could have been possible only with the setting up of Geomatics unit at the State level. This required procurement of satellite images, Hardware, Software, and technically trained manpower. For doing all this 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. Dr.K.D.Singh was the principal consultant for this consultancy.

A small Geomatics Center was set up in 1984 in a small room in the old Aranya Bhavan building with the 386 processor based personal computers with 80 MB hard disk and 1 MB RAM. The first software installed was the IDRISI package provided by FAO. In due course of time other required hardware, software were procured going in pace with technological advancement.

A few Officers of the Department were sent for training in the Remote Sensing and GIS to NRSC, Hyderabad and IIRS, Dehradun. On their return, after successful completion of the training, these Officers started working in the Geomatics centre and started sensitizing the other officers in the use of Remote Sensing, GIS and GPS. Gradually, the trainings were extended to the entire Department and to the others like VSS members.

The first thing required for the monitoring of forest cover changes up to Beat and Compartment level was to create spatial data bases both from Administrative point of view as well as Management point of view. It was decided to create these spatial databases (Vector layers) on 1:250 K scale. This work was outsourced by tender process in November- December 1994 to a private agency called “Remote Sensing Instruments” Hyderabad 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 software and PC Arc Info version 3.4.2 were procured. Subsequently about 50 basic and derived themes were generated on 1:50 K Scale. This data is being used in the monitoring of forest cover changes and several other applications in the department. Right now AP Geomatics Wing has latest State of the art gadgets and software. It has half a dozen high end servers, Work Stations, Firewall, desktops up to range level, In the software side it has Arc GIS Server version 2010, Skyline Software, Arc GIS 2010, Erdas 2010, e- cognition, Leica photogrammetrySuite, Map Info, Arc View to mention a few.

\*Areas are approximate as calculated by APFD GIS cell.





In line with Andhra Pradesh State bifurcation the infrastructure of the Geomatics centre has been apportioned according to the guidelines framed by the Government and the servers were kept common to cater the needs of both states till the residual Andhra Pradesh establishes its own servers in future.

### 1.3 History of Forest cover change Monitoring in AP

The Forest cover monitoring in Andhra Pradesh was initiated in 1995 by Mr. Rudi Drigo of FAO who carried out and demonstrated forest cover change assessment using IRS IA/IB LISS II images of 1988 and 1994 using “Interdependent Visual Interpretation” method. The results were brought out in 1995-96.

Subsequently, the interpretation was done using IRS IC and IRS 1D LISS-III data of 1996 & 1998 and the task was outsourced. These agencies digitally interpreted the densities of the forests and submitted the results to the Forest Department. The notified forests were classified into Water bodies, Blank/others, Scrub (0 to 10% Canopy), Open forest (10% to 40% canopy) and Dense forest (> 40% canopy) in line with FSI classification.

There after the forest cover change monitoring was carried out by the officers of the Geomatics center regularly on annual basis commencing from 2000 AD using digital interpretation methods with LISS-III data. This method was followed up to 2006 and statistics of various classes of Forest canopy cover were generated by eliminating 0.5 Ha Area.

The Forest of Andhra Pradesh is mostly deciduous in nature and its canopy density widely changes in different months. Experience has shown that complete digital interpretation, without input from visual editing does not give a satisfactory level of accuracy. Further, it was noticed that repeated digital classification was prone to interpretational errors and overlaying two classified images didn't give proper change image at times. It was therefore decided to use visual editing after classifying the image of 2007 to get a correct interpretation of areas not properly classified by the digital methods. NDVI slicing cum limited visual editing was resorted to for Srikakulam, Vijayanagaram, Visakhapatnam, East Godavari, West Godavari, Krishna, Guntur, Prakasham, Nellore, Chittoor, Anantpur and Kurnool districts. However to check the relative accuracies of various methods, other methods apart from NDVI slicing cum visual editing like Unsupervised classification cum Supervised classification were also attempted in Kadapa, and better method in terms of final accuracy was taken. With 2007 classified image as a base classification various years of images were classified and changes brought out by Erdas matrix tool and Visual comparison taking clues from Google, Bhuvan etc. The change areas both +ve and -ve are polygonised in Arc map software after swiping, keeping all previous years polygons as a separate layers. The changes were to some extent groundtruthed 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 APFD's website. Feedback was obtained through a web enabled MIS package developed by the Department called as “Forest Cover Change MIS” (FCCMIS).

Over the years before 2007 the digital interpretation of Satellite data had been done independently, as a result changes in Forest cover were prone to subjectivity resulting in interpretational errors. Therefore, APFD has switched over to Vector based approach like the FSI from 2007 in which forest cover is mapped in polygons (Vector) by defining clusters of pixels with boundaries. This improves the cartographic presentation of the output, helps in mapping the changes more accurately and makes the output available for use by protection staff. Both positive and negative changes were captured for about **622(506 negative changes, 116 positive changes)** locations and communicated to field staff for verification & feedback.

As per the ordinance issued by Government of India on 29.05.2014, the Andhra Pradesh Reorganisation Act, 2014, section 3 is amended as follows, which came into force at once.

For the words, brackets, letters and figures “Khammam (but excluding the revenue villages in the Mandals specified in G.O.Ms. No. 111 Irrigation & CAD (LA IV R&R-I) Department, dated the 27th June, 2005 and the revenue villages of Bhurgampadu, Seetharamanagaram and Kondreka in Bhurgumpadu Mandal)”, the words and brackets “Khammam (but excluding the Mandals of Kukunoor, Velairpadu and Bhurgampadu but not including its revenue villages of Pinapaka, Morampalli Banzar, Bhurgampadu, Nagineniprolu, Krishnasagar, Tekula, Sarapaka, Iravendi, Mothepattinagar, Uppusaka, Sompalli and Nakripeta under the Palvancha Revenue Division, and the Mandals of Chintoor, Kunavaram, Vararamachandrapuram and Bhadrachalam but not including the revenue village of Bhadrachalam under the Bhadrachalam Revenue Division)” shall be substituted.



The District wise forest cover in A.P. is as follows :

District wise Forest cover details of Andhra Pradesh							
District Name	Very Dense Forest	Moderate Dense Forest	Open Forest	Scrub Forest	Non Forest	Water Bodies	Total (In Km <sup>2</sup> )
Ananthapur	0.00	5.18	70.80	767.27	1098.46	3.89	1945.60
Chittoor	69.85	1843.50	1742.23	673.60	165.69	1.23	4496.10
East Godavari	67.18	1996.70	743.74	30.89	244.03	152.85	3235.39
Guntur	0.00	124.24	278.71	942.96	108.50	22.50	1476.91
Kadapa	103.58	1060.41	2218.77	1456.98	206.29	6.87	5052.90
Krishna	0.00	2.99	369.65	172.76	47.27	51.85	644.52
Kurnool	6.32	973.39	830.88	742.73	939.42	62.04	3554.78
Nellore	50.80	486.64	464.68	1073.78	273.15	30.91	2379.96
Prakasham	31.64	675.42	2086.34	1927.66	80.61	27.29	4828.96
Srikakulam	0.00	11.52	216.03	315.53	174.91	3.72	721.71
Vishakapatnam	104.65	2221.76	1212.97	735.72	352.40	3.87	4631.37
Vizianagaram	0.06	530.41	490.42	121.47	73.75	3.17	1219.28
Westgodavari	41.47	530.76	45.90	107.25	46.78	0.86	773.02
Kahammam	175.70	1347.30	167.42	173.17	89.23	1.46	1954.28
<b>Total</b>	<b>651.25</b>	<b>11810.22</b>	<b>10938.54</b>	<b>9241.77</b>	<b>3900.49</b>	<b>372.51</b>	<b>36914.78</b>





## Chapter-II

# Methodology

### 2.1 Satellite data and its period

The Satellite data for the entire State was procured from the National Remote Sensing Centre (NRSC), Hyderabad in digital format. It was multi spectral (LISS- III Sensor) data of IRS Resourcesat-2 satellite with a spatial resolution of 23.5m.

One scene of LISS – III covers an area of about 20,000 km<sup>2</sup> (140 km X 140 km). There are considerable overlaps (15 to 20 percent) among adjacent scenes. At the borders of the State or for islands, the whole scene has to be procured even though the Area of Interest (AOI) may be small. Thus a total of 21 scenes covering the entire state were procured.

The scene wise details of data procured are as follows:

S.No	Path/Row (P/R)	Date of Pass 2011	Date of Pass 2012	Remarks
1	99-62	27/01/2012	10/11/2012	Cloud free
2	99-63	03/01/2012	17/10/2012	Cloud free
3	100-61	20/01/2012	10/10/2012	Partly Cloudy
4	100-62	08/01/2012	10/10/2012	Cloud Free
5	100-63	08/01/2012	10/10/2012	Cloud free
6	101-61	18/02/2012	08/11/2012	Partly Cloudy
7	101-62	06/02/2012	02/12/2012	Partly Cloudy
8	101-63	18/02/2012	20/11/2012	Cloud Free
9	101-64	18/02/2012	20/11/2012	Cloud free
10	102-60	07/11/2011	13/11/2012	Cloud free
11	102-61	07/11/2011	13/11/2012	Cloud free
12	102-62	07/11/2011	13/11/2012	Cloud free
13	102-63	18/03/2012	<b>Not available</b>	<b>Not available</b>
14	102-64	18/03/2012	<b>Not available</b>	<b>Not available</b>
15	103-59	19/10/2011	covered in 103-60	Cloud Free
16	103-60	19/10/2011	12/12/2012	Cloud free
17	103-61	19/10/2011	12/12/2012	Cloud free
18	104-59	30/09/2011	06/10/2012	Partly Cloudy
19	104-60	17/11/2011	30/10/2012	Cloud Free
20	105-059	02/02/2012	28/11/2012	Cloud free
21	105-060	02/02/2012	28/11/2012	Cloud free

### 2.2 Technical Advisory Committee:

Government of Andhra Pradesh has constituted a Technical Advisory Committee Vide G.O.Ms No.121, EFS & T- (For-III) Dept. Dated 04.12.2009 to aid and advise Andhra Pradesh Forest Department in matters of Remote Sensing & GIS application.



This committee was re-constituted by the Govt. vide G.O.Ms.No.57, EFS & T- (For-III) Dept.

Dated 07.05.2011, with the following Members:

1. Representative from Forest Survey of India, Dehradun - Member
2. The Addl. Director (Scientific-Biosphere reserves)  
Representative of MoEF, New Delhi. - Member
3. The Head, Forestry Division, NRSC, Hyderabad - Member
4. The Director General, APSRAC, Hyderabad - Member
5. Dr. DevendraPandey, IFS (Retd.)  
Ex-DG of FSI, Dehradun, presently stationed at New Delhi. - Member
6. Addl. Prl. CCF (IT), O/o Prl.CCF, Hyderabad - Convener

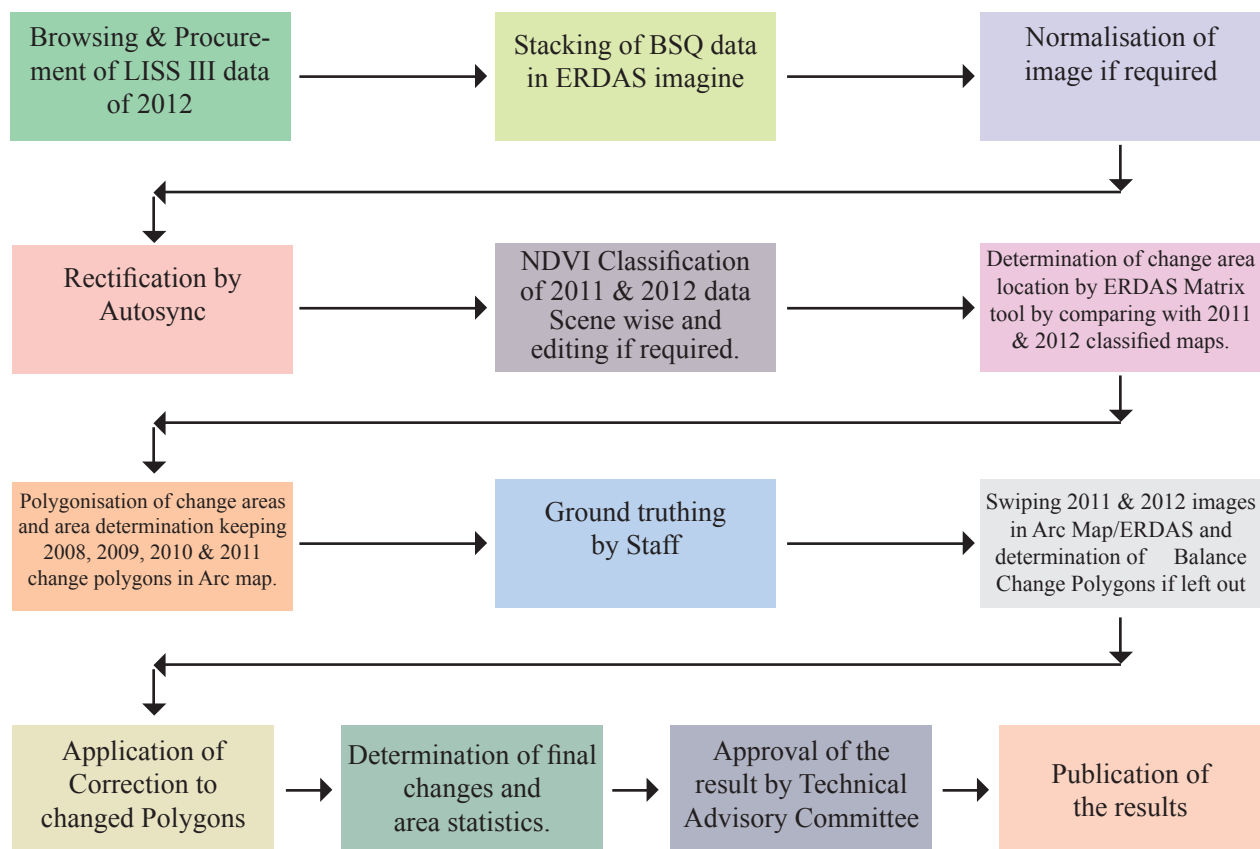
### 2.3. Image Processing Technique Adopted:

The 2007 image has been previously classified as Very Dense Forest, Moderately Dense Forest, Open Forest, Scrub, Non-Forests and water with an accuracy of 85%. This Classified image was taken as the basis for bringing out forest cover changes of 2008, 2009 & 2010. The change polygons were also taken into account to determine the changes by overlaying them on the classified image till 2010. This year fresh classification was done using 2011 images and the change polygons were obtained between 2011 -2012 based on the fresh classification. Because of the new classification the statistics showing the Very Dense Forest, Moderately Dense Forest, Open Forest, Scrub, Non-Forests and water to certain extent varied from 2007 classification.

The **Erdas Auto sync module** was used to register the 2011 image taking 2007 images as base. After this, the 2011 image was classified into various classes and the Erdas matrix tool was used to determine various changes from each class of 2011 to each class of 2012. The 2008, 2009 & 2010 change polygons were overlaid on the 2012 FCC and changes between 2011 and 2012 only were determined by manual Polygonisation. Arc Map was used for change Polygon determination by swiping. Various polygon changes of 2008, 2009 & 2010 as well as 2011 & 2012 images and compartment layer were kept as layers in Arc Map to examine the changes.

The lat-long of the change Polygons as well as change classes (both from class & to class) and extent of area changed were communicated to the field Officers online using APFMIS - **Forest Cover Change Monitoring Information System** module for verification of each change location and reports were obtained online. About 10% points were checked by the officers of Geomatics wing. There was good correlation between the points shown in the lab and the situation on ground. It was noticed that the change points tallied in area, location and shape on the ground. The flow diagram of the work carried out is as follows:





## 2.4 Limitations of Technology

The following are the limitations of the technology:

- As the resolution of data from LISS-III is 23.5 m, smaller areas below 0.40 Ha cannot be captured. Thresholds of various classes are not very precise and subjective.
- Young plantations and species having less chlorophyll content in their crown, do not give proper reflectance and as a result they are classified as scrub.
- 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 of our deciduous forests 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.

## 2.5 Accuracy Assessment

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

## 2.6 Cost and time of bringing out APSFR 2014

An expenditure of approx. Rs.17 lakh is involved in the entire exercise (excluding the cost of Forest Department person days.) The details are as follows:





S.No	Item of Works	Cost in Rs
1	Cost of 21 scenes of LISS III data @ 7000/- per scene	147000.00
2	Proportionate cost of Software in average ERDAS packages and 1 autosync is used only 20 % Cost is projected.	150000.00
3	Cost of Hardware – 25% of 6 Computers Cost	63000.00
4	Cost of 6 Scientists doing lab and field work per 1 year.	1200000.00
5	Cost of field trips	25000.00
6	Cost of Printing of SFR (400 Copies)	100000.00
7	Miscellaneous	15000.00
	<b>Total</b>	<b>1700000.00</b>

S.No	Item of Work	Time schedule
1.	Browsing ordering and collection of data from NRSC	September 2012 to March 2013.
2.	Geo – referencing, classification and detection of change polygons.	November 2012 to March 2013.
3.	Ground truthing the change polygons	January 2013 to May 2014.
4.	Collection of feedback from field staff.	January 2013 to May 2014.
5.	Preparation of Report	May 2014 to December 2014.
6.	Printing of report	December 2014.

The accuracy assessment of 2011 classification was done from ground truthing, Google, inventory data and the following table gives the accuracy of classification.

**Table –Error Matrix.**

Accuracy assessment of classification-2011										
As assessed from image	As checked from the high resolution image								Users Accuracy (%)	Error of Comission (%)
		VDF	MDF	OF	SF	NF	Water	Total		
	<b>VDF</b>	2	3	2	0	0	0	7	28.57	71.43
	<b>MDF</b>	0	97	0	10	3	0	110	88.18	11.82
	<b>OF</b>	0	2	56	16	4	0	78	71.79	28.21
	<b>SF</b>	0	0	5	66	7	0	78	84.62	15.38
	<b>NF</b>	0	0	1	2	20	0	23	86.96	13.04
	<b>Water</b>	0	0	0	0	1	3	4	75.00	25.00
	<b>Total</b>	2	102	64	94	35	3	300		
	<b>Producers Accuracy (%)</b>	100.00	95.10	87.50	70.21	57.14	100.00			
<b>Error of Omission (%)</b>	0	4.90	12.50	29.79	42.86	0.00				

**The Overall accuracy attained was 81.3%.**

$$\hat{K}=0.744 \text{ (Kappa Coefficient)}$$





## Chapter - III

# Statewide Results and Analysis

### 3.1. Introduction:

Andhra Pradesh State lies between latitudes 12°41' & 22°N and longitudes 77° & 84°40'E. The Geographical area of the State is 1,62,440.1 km<sup>2</sup> which is 5.13 % of the landmass of the country and the state has 974 kilometers of coastline. The State has three physiographic zones, the hilly region having Nallamalai, Erramalai hills and the Eastern Ghats having an altitude of 500 to 1400 m; the plateau having an altitude of 100 m to 1000 m and the deltas of rivers between the Eastern Ghats and the Sea Coast. Godavari, Krishna and Pennar are the 3 principal rivers of the State which drain into the Bay of Bengal. The River Godavari with its tributaries Pranahita, Manjeera, Maneru, Indravati, Kinnerasani, Pamuleru and Sileru, drains through the northern parts of the State into Bay of Bengal. The River Krishna with its tributaries Tungabhadra, Vedhavati, Hundri, Musi, Paleru and Munneru flows through the central parts of the State. The River Pennar, the third biggest river, with its tributaries Chitravati, Papaghni, Cheyyeru and Pincha drains through Rayalaseema region and Nellore district.

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°C to 50°C and the annual rainfall is about 500-1300 mm, received mainly from Southwest and Northeast monsoons. The geological formations of the State are: (1) The unclassified Archaean crystalline rocks are mainly the granite but in the eastern ghats they comprise of granulite suites (khondalites and kodurites), (2) The Middle–Upper Proterozoic the Cuddapahs and its equivalents; (3) The Mesozoic coal bearing Gondwana strata, (4) Eocene lava flows (the Deccan traps) and (5) 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 4.94 Crore which accounts for 4.08% of country's population (2011 Census). The male population is 2.47 Crore (50.1%) and female population is 2.46 Crore (49.9%). The Per capita forest area is **0.08 Ha**. The population density is 308 persons per Km<sup>2</sup>. **As per 2011 census**, the Livestock population consists of 46.06 lakh Cattle, 64.34 lakh Buffaloes, 135.37 lakh Sheep, 44.17 lakh Goats and 815.60 lakh Poultry besides others.

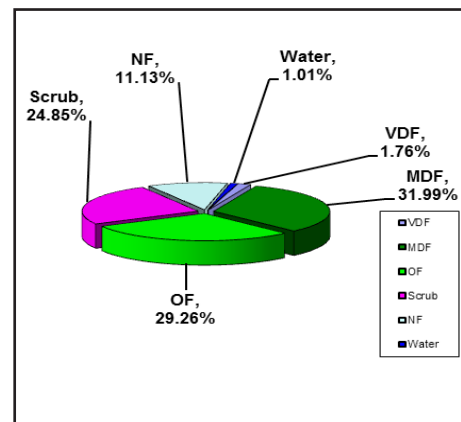
**Table 3.1: Land use Pattern**

S.no	Land use	Area in Sq.Km	%
1	Forest including scrub	36914.69	22.73
2	Agriculture	78388	48.26
3	Built up area	4885	3.01
4	Fallow lands	17739	10.92
5	Waste lands	15902.2	9.79
6	Water bodies	9168.7	5.64
7	Wet lands	1589.1	0.98
8	Aquaculture	1801.2	1.11
9	<b>Total</b>	<b>162440.1</b>	<b>100.00</b>

### 3.2. Recorded Forest Area:

The total notified forest area of the State is 36914.69 Km<sup>2</sup>, which is 22.73 % of the geographical area. They include Reserved, Protected- and Un-classed forests. The Kadapa has the highest notified forest area of 5041.26Km<sup>2</sup> and the Krishna has the lowest notified forest area of 664.28 Km<sup>2</sup> in the State. As regards the ratio of notified forest to geographical area, Vishakhapatnam District has the highest with 41.50 % and Krishna is the lowest with 7.38 %. As per Champion and Seth's classification the Forests of State fall under Southern Moist Mixed Deciduous Forest, Littoral Swamp Forest, Dry Teak Forest, Dry Red Sanders Bearing Forest, Southern Dry Mixed Deciduous Forest, Dry Deciduous Scrub, Dry Savannah Forest, *Hardwickia* Forest, Dry Bamboo Brakes, Souther Thorn Forest, Dry Scrub Forest, Tropical Dry Evergreen Forest types. The distribution of the forest cover of the State is shown in Figure 3.1.

**Figure 3.1.**



### 3.3. Protected Area:

The State has 16 Protected Areas – 13 Wildlife Sanctuaries, 3 National Parks and one Tiger Reserve. Nagarjuna Sagar–Srisailem Tiger Reserve (NSTR) is the biggest Tiger Reserve of India. Out of 36914.77 Km<sup>2</sup> of notified forest area, 8137.08 Km<sup>2</sup> is included in the PA network.

### 3.4. Community Forest Management:

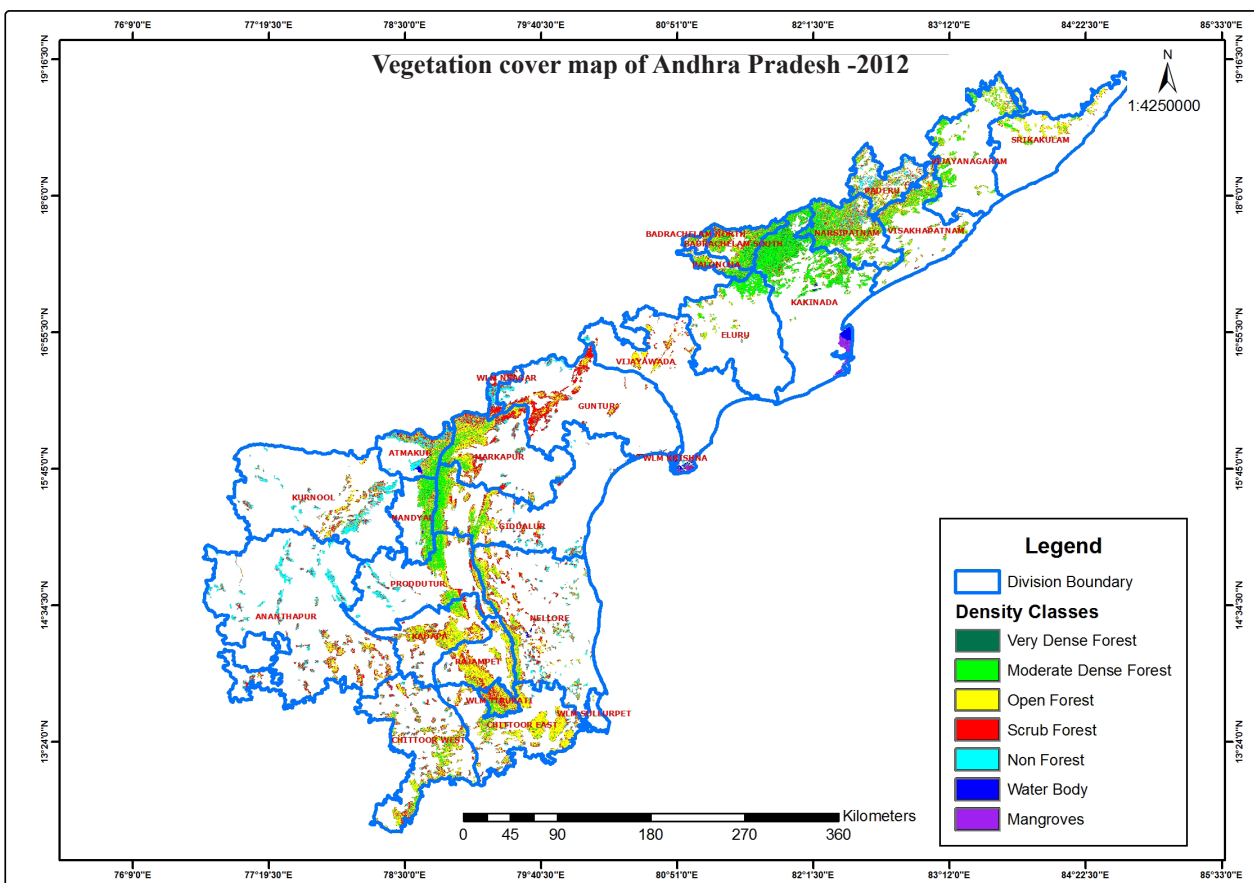
There are 4,419 Vana Samrakshana Samities (VSSs) or Joint Forest Protection Committees (JFPCs) in the State. An area of 8426.11 Km<sup>2</sup> of notified forests, which is 22.8 % of the forest area, is under Community Forest Management (CFM).

### 3.5. Forest Cover:

The forest cover\* in the State based on the interpretation of IRS P6 LISS-III 2012 data (September 2012 - March 2013) is 23399.95 Km<sup>2</sup>, which is 15.24% of the Geographical area. In terms of the forest canopy cover density classes the State has 651.25 Km<sup>2</sup> of Very Dense Forest, 11810.20 Km<sup>2</sup> of Moderately Dense Forest and 10938.50 Km<sup>2</sup> of Open Forest. The area of the Scrub is 9241.79 Km<sup>2</sup>, Non-Forest 3900.52 Km<sup>2</sup> and Water Bodies 372.51 Km<sup>2</sup>. The distribution of the forest cover of the State is shown in Figure 3.2.

*\*The forest cover includes VDF, MDF and OF only.*

Figure 3.2



The distribution of Forest Cover in the CFM areas is 65.08 Km<sup>2</sup> in Very Dense Forest, 2259.78 Km<sup>2</sup> in Moderately Dense Forest and 2399.85 Km<sup>2</sup> in Open Forest. The area of Scrub is 2402.73 Km<sup>2</sup>, Non-Forest 1282.60 Km<sup>2</sup> and Water bodies 16.06 Km<sup>2</sup>.



The distribution of Forest Cover in the PA areas is 172.09 Km<sup>2</sup> in Very Dense Forest, 2768.48 Km<sup>2</sup> in Moderately Dense Forest and 2624.15 Km<sup>2</sup> in Open Forest. The area of Scrub is 1243.69 Km<sup>2</sup>; Non-Forest 832.18 Km<sup>2</sup> & Water bodies 496.50 Km<sup>2</sup>.

Change in Forest Cover (Including Scrub and Non-Forest): An analysis of the total extent of Forests between 2011 and 2012 shows that degradation is seen in an area of 43.24 Km<sup>2</sup> and positive change in 27.31 Km<sup>2</sup>. Thus an area of 37.47 Km<sup>2</sup> of forests (3.31 Km<sup>2</sup> of MDF, 8.85 Km<sup>2</sup> of open forests and 25.31 Km<sup>2</sup> of scrub) is converted to Non forest during the year.

On further analysis it is seen that out of this 43.24 Km<sup>2</sup> of loss of forest, an area of 12.39 Km<sup>2</sup> is due to attempts of fresh encroachments in the State and 30.10 Km<sup>2</sup> is due to harvesting of matured plantations, clearance of jungle growth for raising of plantations and failure plantations; 0.67 Km<sup>2</sup> is due to diversion of forest land and 0.08 Km<sup>2</sup> is due to forest fires. The latter (except forest fire) are management interventions and hence cannot be considered as permanent loss of forest cover. Hence loss of forest cover due to encroachments is taken as net loss of forest cover, which is 12.39 Km<sup>2</sup>. Out of this an area of 1.74 Km<sup>2</sup> is inside VSS areas and 0.20 Km<sup>2</sup> inside the Protected Areas.

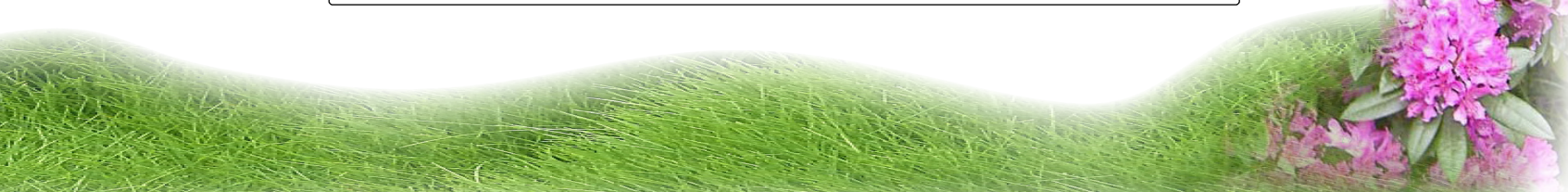
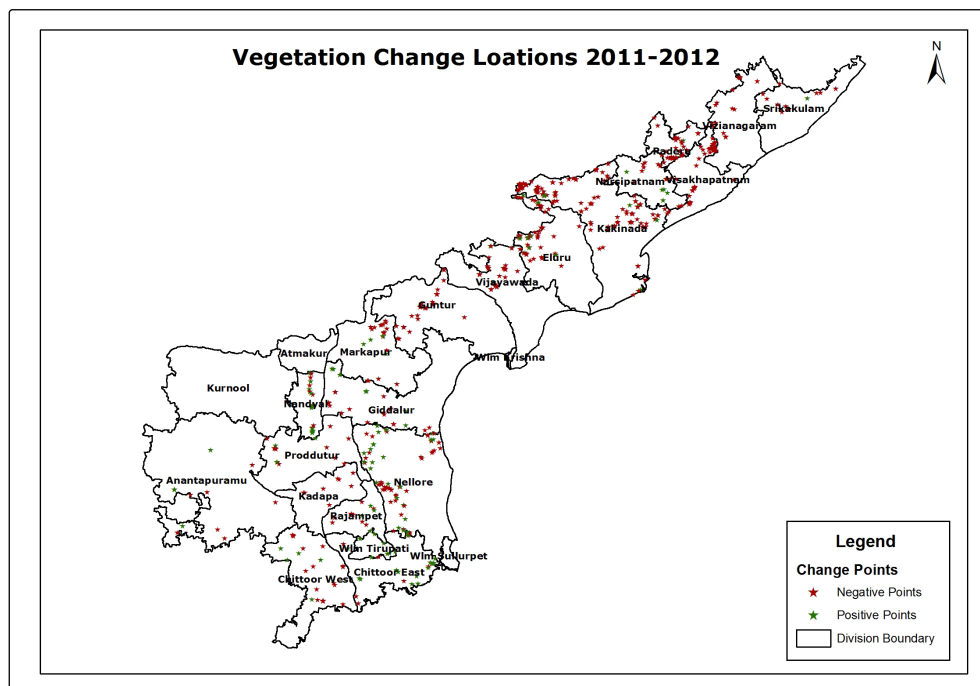
Encroachments were noticed in 19 Divisions, Net positive change is seen in 04 Divisions (Chittoor East, Markapur, Nandyal and WLM-Tirupathi) and there are no changes in 02 Divisions (Atmakur, Kurnool).

Change in Forest Cover (Excluding Scrub and Non-Forest): The forest cover in VDF, MDF and OF in 2011 was 651.25 Km<sup>2</sup>, 11814.23 Km<sup>2</sup> and 10944.21 Km<sup>2</sup> respectively. However in 2012 it is 651.25 Km<sup>2</sup>, 11810.20 Km<sup>2</sup> and 10938.50 Km<sup>2</sup> respectively. Thus there was a reduction of 4.03 Km<sup>2</sup> in MDF and 5.71 Km<sup>2</sup> in OF. The net loss of forest cover in MDF and OF put together is 9.74 Km<sup>2</sup> in the State during the year.

Divisions with most loss of Forest Cover due to encroachments are Giddalur, Kakinada, Markapur, Eluru and Paderu.

In CFM areas, there is a net loss of 1.74 Km<sup>2</sup> of forest cover. In Protected Areas, there is a net loss of 0.20 Km<sup>2</sup> of forest cover. The change locations are shown in Figure 3.3. It is noticed that in 46 VSS in the state there is 174 Hectares of encroachment.

Figure 3.3



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 4.03 Km<sup>2</sup> of moderately dense forest and 5.71 Km<sup>2</sup> of open forest.

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 of encroachments.

**Division wise forest cover** in different forest canopy density classes along with the changes compared to 2011 assessment is given in **Table 3.3**.

2011	2012						Total of 2011
	VDF	MDF	OF	Scrub	NF	Water	
Very Dense Forest	651.25	0.00	0.00	0.00	0.00	0.00	<b>651.25</b>
Moderately Dense Forest	0.00	11807.85	1.00	2.07	3.31	0.00	<b>11814.23</b>
Open Forest	0.00	2.26	10930.40	2.70	8.85	0.00	<b>10944.21</b>
Scrub	0.00	0.09	6.59	9219.16	25.31	0.00	<b>9251.15</b>
Non-Forest	0.00	0.00	0.51	17.86	3863.05	0.00	<b>3881.42</b>
Water	0.00	0.00	0.00	0.00	0.00	372.51	<b>372.51</b>
<b>Total of 2012</b>	<b>651.25</b>	<b>11810.20</b>	<b>10938.50</b>	<b>9241.79</b>	<b>3900.52</b>	<b>372.51</b>	<b>36914.77</b>
Net Change	0.00	-4.03	-5.71	-9.36	19.10	0.00	

Circle	Division	VDF	MDF	OF	SF	NF	WB	Total	Encroachment
<b>Ananthapur</b>	Ananthapur	0	5.18	70.8	767.27	1098.46	3.89	1945.6	0.38
	Chitoor West	35.02	1248.65	594.47	141.11	69.75	0.76	2089.76	0.18
<b>Total</b>		<b>35.02</b>	<b>1253.83</b>	<b>665.27</b>	<b>908.38</b>	<b>1168.21</b>	<b>4.65</b>	<b>4035.36</b>	<b>0.55</b>
<b>Fdpt Srisailam</b>	Atmakur	1.74	300.11	326.1	357.92	241.43	58.47	1285.77	0
	Markapur	7	207.36	1183.02	1148.03	49.39	25.95	2620.75	1.08
<b>Total</b>		<b>8.74</b>	<b>507.47</b>	<b>1509.12</b>	<b>1505.95</b>	<b>290.82</b>	<b>84.42</b>	<b>3906.52</b>	<b>1.08</b>
<b>Guntur</b>	Giddalur	24.64	468.06	903.32	779.63	31.22	1.34	2208.21	1.75
	Guntur	0	124.24	278.71	942.96	108.5	22.5	1476.91	0.13
	Nellore	50.8	486.64	464.68	1073.78	273.15	30.91	2379.96	0.17
<b>Total</b>		<b>75.44</b>	<b>1078.94</b>	<b>1646.71</b>	<b>2796.37</b>	<b>412.87</b>	<b>54.75</b>	<b>6065.08</b>	<b>2.05</b>
<b>Kurnool</b>	Kadapa	1.24	158.06	894.38	586.02	75.87	0.98	1716.55	0.57
	Kurnool	0	1.13	147.97	356.11	696.02	1.32	1202.55	0
	Nandyal	4.58	672.15	356.81	28.7	1.97	2.25	1066.46	0
	Proddatur	2.55	77.3	900.01	545.64	45.65	3.96	1575.11	0.08
<b>Total</b>		<b>8.37</b>	<b>908.64</b>	<b>2299.17</b>	<b>1516.47</b>	<b>819.51</b>	<b>8.51</b>	<b>5560.67</b>	<b>0.65</b>
<b>Rajahmundry</b>	Eluru	41.47	530.76	45.9	107.25	46.78	0.86	773.02	1.05
	Kakinada	67.18	1996.7	743.74	30.89	244.03	152.85	3235.39	1.18
	Vijayawada	0	2.99	369.65	172.76	47.27	51.85	644.52	0.23
<b>Total</b>		<b>108.65</b>	<b>2530.45</b>	<b>1159.29</b>	<b>310.9</b>	<b>338.08</b>	<b>205.56</b>	<b>4652.93</b>	<b>2.46</b>



Table 3.3 Division wise Forest Cover Changes									(Area in Km <sup>2</sup> )
Circle	Division	VDF	MDF	OF	SF	NF	WB	Total	Encroachment
Vishakapatnam	Narsipatnam	98.15	1564.66	279.07	121.96	289.36	0.55	2353.75	0.22
	Paderu	3.16	196.09	410.62	367.2	33.21	1.24	1011.52	1.03
	Srikakulam	0	11.52	216.03	315.53	174.91	3.72	721.71	0.14
	Vizianagaram	0.06	530.41	490.42	121.47	73.75	3.17	1219.28	0.33
	Vishakapatnam	3.34	461.01	523.28	246.56	29.83	2.08	1266.1	0.61
<b>Total</b>		<b>104.71</b>	<b>2763.69</b>	<b>1919.42</b>	<b>1172.72</b>	<b>601.06</b>	<b>10.76</b>	<b>6572.36</b>	<b>2.33</b>
Wlm Tirupathi	Chitoor East	0	306.84	1036.18	451.32	92.23	0.25	1886.82	0.43
	Wlm Tirupathi	59.4	495.2	175.05	94.28	4.65	0.24	828.82	0
	Rajampet	75.22	617.86	360.91	312.21	83.83	1.91	1451.94	0.79
<b>Total</b>		<b>134.62</b>	<b>1419.9</b>	<b>1572.14</b>	<b>857.81</b>	<b>180.71</b>	<b>2.4</b>	<b>4167.58</b>	<b>1.22</b>
Rajahmundry	Khammam Part	175.7	1347.3	167.42	173.17	89.23	1.46	1954.28	2.05
<b>Total</b>		<b>175.7</b>	<b>1347.3</b>	<b>167.42</b>	<b>173.17</b>	<b>89.23</b>	<b>1.46</b>	<b>1954.28</b>	<b>2.05</b>
<b>GRAND TOTAL</b>		<b>651.25</b>	<b>11810.22</b>	<b>10938.54</b>	<b>9241.77</b>	<b>3900.49</b>	<b>372.51</b>	<b>36914.78</b>	<b>12.39</b>

As seen from above table, Vishakhapatnam circle has maximum forest cover of 4787.82 Km<sup>2</sup> (VDF+MDF+OF). Similarly Kakinada division of Rajahmundry circle has maximum forest cover amongst the divisions in the state, which is 2807.62 Km<sup>2</sup>.











Chapter - IV

## **FOREST DIVISION WISE RESULTS**









## 4.1 ANANTHAPUR DIVISION

### 4.1.1 Introduction:

Ananthapur Forest Division lies in the South Western part of Andhra Pradesh between latitudes 13°40'52.32" and 15°14'0.24"N and longitudes 76°45'39.96" and 78° 28' 14.52"E. Geographical Area of the Division (and the District) is 19130 Km<sup>2</sup>. The Division's northern and central portions are a high plateau, generally undulating with large granite rocks or low hill ranges rising occasionally above its surface. In the southern portion of the district, the surface is hilly. Six rivers flow through the district. These are Penna, Chithravathi, Vedavathi, Papagni, Swarnamukhi and Thadakaleru.

Land use pattern of the Division is given in Table 4.1.1

**Table 4.1.1: Land use Pattern**

The climate of this Division is generally dry with temperatures ranging from 20°C to 40°C and the annual rainfall is about 553.00 mm, received from Southwest monsoon (338 mm) and North East monsoon (156.0 mm). The failure of the rains in South West monsoon period of June to September leads to drought in the district resulting in failure of the crops.

Land use	Area in Km <sup>2</sup>	Percentage
Forest including Scrub	1060.42	5.54
Agriculture	15173.67	79.32
Land with Scrub	1286.08	6.72
Fallow Lands	802.60	4.20
Grasslands	28.66	0.15
Settlements	58.89	0.31
Vegetation outside Forest	134.32	0.70
Water bodies	585.36	3.06
<b>Total</b>	<b>19130</b>	

The District can be divided into 3 Natural Divisions. These are 1) Northern portion of black cotton soils (2) Central portion mainly made up of arid region with poor red soils & (3) High Level Land connecting with Mysore plateau at higher elevation having sandy red soils of normal productivity. The soils in Ananthapur District are predominantly red (76%) followed by black (24%) which occur in certain pockets.

The population of the District is 4.08 million (2011 Census). The Per capita forest area is 0.054 Ha. The population density is 213 persons per Km<sup>2</sup>. The livestock population is 8.25 million.

### 4.1.2 Recorded Forest Area:

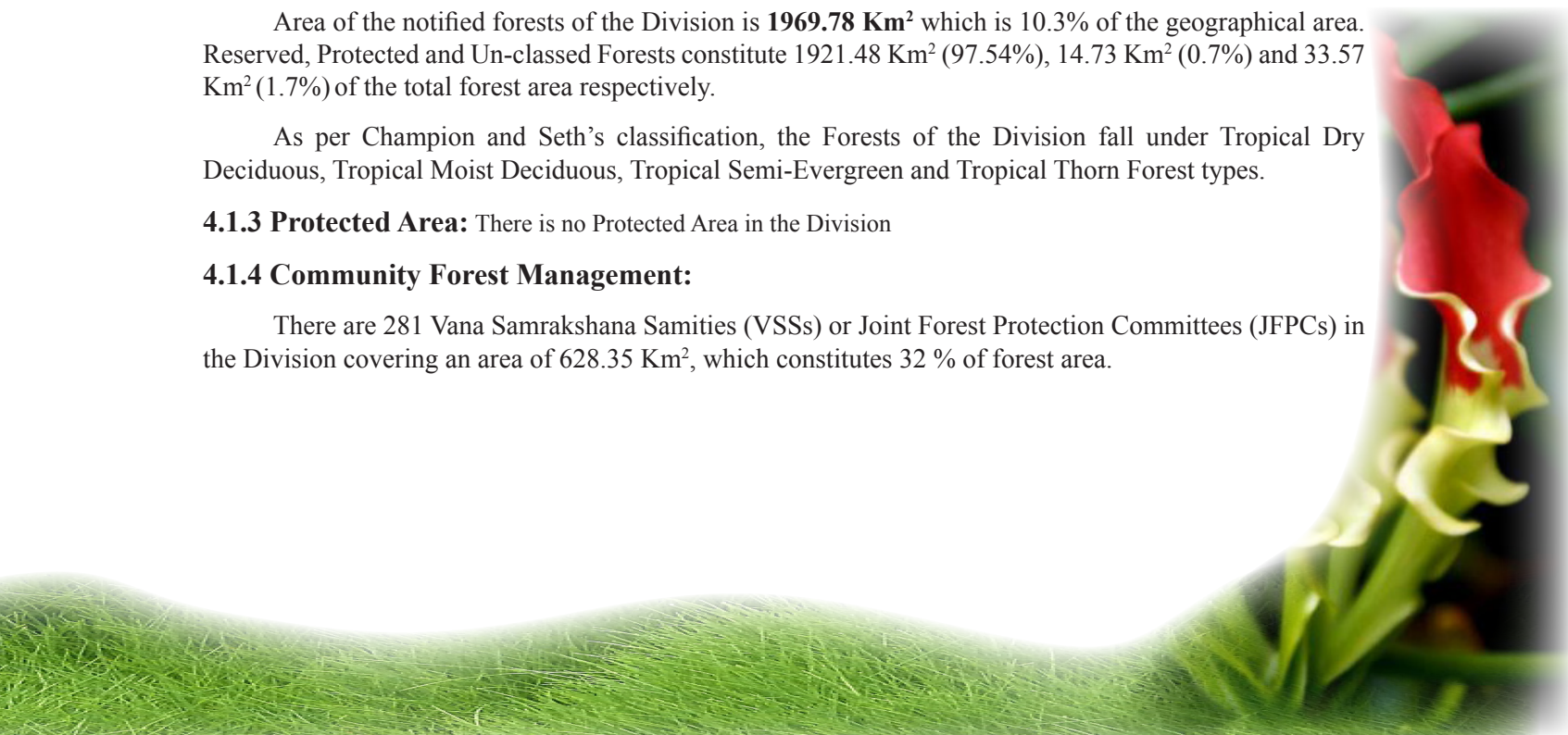
Area of the notified forests of the Division is **1969.78 Km<sup>2</sup>** which is 10.3% of the geographical area. Reserved, Protected and Un-classed Forests constitute 1921.48 Km<sup>2</sup> (97.54%), 14.73 Km<sup>2</sup> (0.7%) and 33.57 Km<sup>2</sup> (1.7%) of the total forest area respectively.

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

**4.1.3 Protected Area:** There is no Protected Area in the Division

### 4.1.4 Community Forest Management:

There are 281 Vana Samrakshana Samities (VSSs) or Joint Forest Protection Committees (JFPCs) in the Division covering an area of 628.35 Km<sup>2</sup>, which constitutes 32 % of forest area.



#### 4.1.5 Forest Cover:

The forest cover in the Division based on the Interpretation of IRS R2 LISS III 2012 data (Oct 2012) is **75.98 Km<sup>2</sup>** which is **0.39%** of the Geographical area. In terms of the forest canopy density classes, the Division has **5.18 Km<sup>2</sup>** of Moderately Dense Forests and **70.80 Km<sup>2</sup>** of Open Forests. The area of the Scrub is **767.27 Km<sup>2</sup>**, Non-Forest **1098.46 Km<sup>2</sup>** and Water Bodies **3.89 Km<sup>2</sup>**. The distribution of the forest cover of the Division is shown in Fig 4.1.1

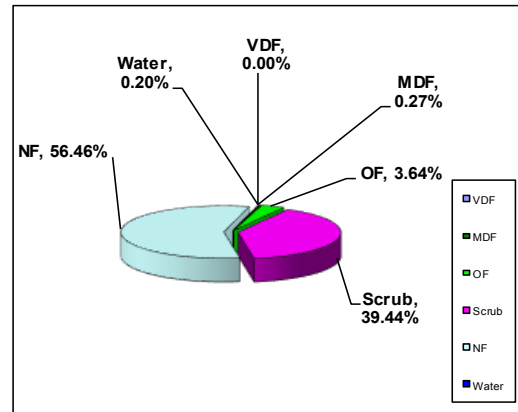


Fig 4.1.1

#### 4.1.6 Change in Forest Cover:

The Satellite images of 2011 and 2012 are shown in Fig 4.1.2 & Fig 4.1.3 respectively and the changes during this period are shown on the image of 2012.

Comparison of the current forest cover with that of previous assessment year shows **no negative change**. The forest cover change matrix given in Table 4.1.2 reveals that there is a decrease of **75.11 Ha** of scrub.

The total positive change (including scrub) is **33.78 Ha**, which is on account of growth in raised plantations. The total negative change (including scrub) is **108.95 Ha**. Out of this, **71.12 Ha** is on account of clearance of jungle growth for raising of plantations, and **37.83 Ha** is on account of encroachments. As clearance of jungle growth for raising of plantations and diversion of forest lands for non forestry purposes are forest management interventions, the same are not considered as loss of forest cover. Therefore, the **net loss is 37.83 Ha** of Forest cover in the Division.

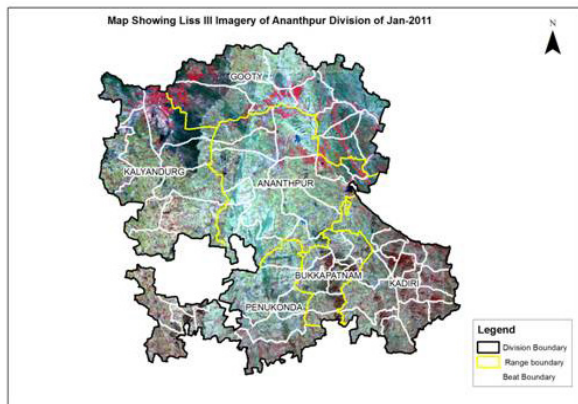


Fig 4.1.2

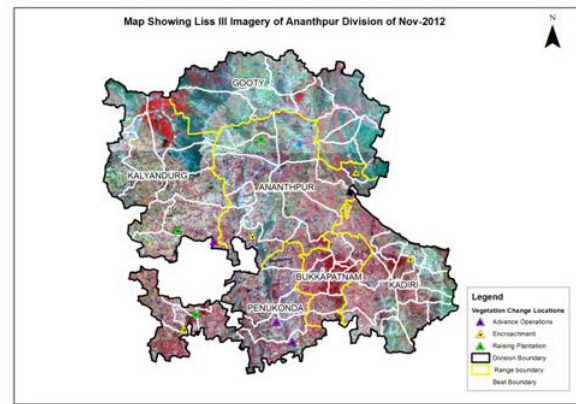


Fig 4.1.3

There are 72 Beats in the Division. Negative changes in forest cover are noticed in 7 Beats and Positive changes in forest cover are noticed in 1 Beat. There are no changes in the remaining 64 Beats.

Details of Forest Cover along with changes in the 72 Beats are shown in Table 4.1.3.

Table 4.1.2: Forest Cover change matrix							(Area in Km <sup>2</sup> )
2011	2012						Total of 2011
	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	5.18	0.00	0.00	0.00	0.00	5.18
Open Forest	0.00	0.00	70.80	0.00	0.00	0.00	70.80
Scrub	0.00	0.00	0.00	766.93	1.09	0.00	768.02
Non-Forest	0.00	0.00	0.00	0.34	1097.37	0.00	1097.71
Water	0.00	0.00	0.00	0.00	0.00	3.89	3.89
<b>Total of 2012</b>	<b>0.00</b>	<b>5.18</b>	<b>70.80</b>	<b>767.27</b>	<b>1098.46</b>	<b>3.89</b>	<b>1945.60</b>
<b>Net Change</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>-0.75</b>	<b>0.75</b>	<b>0.00</b>	

Table 4.1.3: List of Beats showing Forest Cover with changes.										(Area in Ha)
BEAT	VDF	MDF	OF	SF	NF	WB	Total	Net Change	Encroachment	
<b>Ananthpur Range</b>										
Bhadrapuram	0.00	0.00	0.00	8.51	2096.26	5.69	2110.46	0.00	0.00	
Daddithota	0.00	2.12	0.00	95.81	2379.69	0.00	2477.62	0.00	0.00	
Darsinamala	0.00	2.38	0.00	339.40	2052.80	0.00	2394.58	0.00	0.00	
Durgam	0.00	0.00	0.00	330.21	1608.90	0.00	1939.11	0.00	0.00	
Ganginenipalli	0.00	1.84	0.00	773.30	1890.38	0.00	2665.51	0.00	0.00	
Kondapalli	0.00	0.00	0.00	2.14	1833.55	0.00	1835.69	0.00	0.00	
Marutla South	0.00	0.00	0.00	20.29	2263.16	9.63	2293.07	7.43	0.00	
Matutla North	0.00	0.00	1.06	27.61	3139.67	12.76	3181.10	0.00	0.00	
Ramagiri East	0.00	0.00	0.00	0.55	1391.24	0.60	1392.38	0.00	0.00	
Ramagiri West	0.00	0.00	0.00	3.68	800.21	0.00	803.89	-10.24	10.24	
Singanamala	0.00	0.00	0.00	8.47	4629.07	0.00	4637.54	0.00	0.00	
Singavaram	0.00	25.33	2.22	100.03	2131.60	1.07	2260.25	0.00	0.00	
Voddipalli	0.00	0.00	0.00	17.30	4514.11	0.00	4531.41	0.00	0.00	
Yellutla	0.00	14.24	2.97	307.90	3257.74	0.00	3582.86	-8.71	8.71	
<b>Total</b>	<b>0.00</b>	<b>45.91</b>	<b>6.26</b>	<b>2035.18</b>	<b>33988.36</b>	<b>29.75</b>	<b>36105.46</b>	<b>-11.52</b>	<b>18.95</b>	
<b>Bukkapatnam Range</b>										
Amagondapalem (E)	0.00	0.00	75.85	3526.56	284.24	0.00	3886.65	0.00	0.00	
Amagondapalem (W)	0.00	0.00	3.45	2404.09	1069.41	0.00	3476.95	0.00	0.00	
Bukkapatnam	0.00	4.39	468.07	2949.78	79.59	0.00	3501.83	0.00	0.00	
Earlampalli	0.00	0.00	20.58	1509.73	78.83	0.00	1609.14	0.00	0.00	
Gangiredepalli	0.00	0.71	210.07	4171.90	718.35	0.00	5101.03	0.00	0.00	
Gunipalli	0.00	0.00	4.33	1607.73	675.78	0.00	2287.84	0.00	0.00	
Kondakamarla	0.00	0.59	40.86	1961.77	253.19	1.82	2258.22	0.00	0.00	
Mylsamudram	0.00	0.00	9.00	1219.78	465.52	0.00	1694.30	0.00	0.00	
Nallamada	0.00	0.00	196.61	2606.98	169.50	0.00	2973.09	0.00	0.00	
Narasampalli	0.00	0.53	92.53	1888.72	21.72	0.00	2003.50	0.00	0.00	
Pamudurthi	0.00	0.39	0.00	2290.35	1332.64	0.00	3623.38	0.00	0.00	
<b>Total</b>	<b>0.00</b>	<b>6.62</b>	<b>1121.34</b>	<b>26137.38</b>	<b>5148.76</b>	<b>1.82</b>	<b>32415.92</b>	<b>0.00</b>	<b>0.00</b>	



**Table 4.1.3: List of Beats showing Forest Cover with changes. (Area in Ha)**

BEAT	VDF	MDF	OF	SF	NF	WB	Total	Net Change	Encroachment
<b>Gooty Range</b>									
Anumpalli	0.00	0.00	0.00	23.92	3630.62	1.12	3655.66	0.00	0.00
Jakkalachruvu	0.00	3.86	5.74	20.31	2899.41	8.44	2937.76	0.00	0.00
Maddipalli	0.00	6.49	0.00	39.21	3218.60	0.00	3264.31	0.00	0.00
Mutchiukota South	0.00	5.54	1.00	52.37	2782.54	63.74	2905.19	0.00	0.00
Mutchukunta	0.00	0.74	0.41	9.40	2510.53	0.77	2521.85	0.00	0.00
Nagasamudram	0.00	0.00	0.89	31.34	3135.97	2.94	3171.15	0.00	0.00
Pandikunta	0.00	0.00	1.00	52.44	4529.58	3.34	4586.44	0.00	0.00
Rayalacheruvu	0.00	0.00	0.00	33.43	1819.86	0.71	1854.00	0.00	0.00
Yadiki	0.00	2.55	0.00	70.57	3796.31	0.00	3869.43	0.00	0.00
Yellanur	0.00	0.00	4.34	95.33	91.85	0.00	191.51	0.00	0.00
<b>Total</b>	<b>0.00</b>	<b>19.17</b>	<b>13.38</b>	<b>428.33</b>	<b>28415.26</b>	<b>81.06</b>	<b>28957.28</b>	<b>0.00</b>	<b>0.00</b>
<b>Kadiri Range</b>									
Chamalagondi	0.00	31.59	670.79	2024.31	51.80	0.00	2778.49	0.00	0.00
Charupalli	0.00	0.00	0.00	959.99	152.16	0.00	1112.15	0.00	0.00
Dorigallu East	0.00	0.00	58.05	2127.39	148.23	0.00	2333.68	0.00	0.00
Dorigallu West	0.00	0.00	1.77	1955.46	634.30	0.00	2591.53	0.00	0.00
Edurudona	0.00	2.54	207.94	3637.70	150.74	0.00	3998.93	0.00	0.00
Kalasamudram	0.00	54.89	731.50	1478.74	153.20	0.00	2418.34	0.00	0.00
Kokkanti	0.00	1.34	237.96	3957.37	250.40	0.00	4447.06	0.00	0.00
Kuntlapalli	0.00	184.18	1781.22	2708.14	37.89	1.49	4712.92	-7.47	7.47
Kurli	0.00	106.56	719.31	2563.91	237.27	0.00	3627.05	0.00	0.00
Peddannavaripalli	0.00	1.95	281.22	2412.70	43.73	0.00	2739.60	0.00	0.00
Tallakalva	0.00	11.42	295.06	2738.70	105.34	1.58	3152.10	0.00	0.00
Talupula	0.00	36.78	327.33	1228.60	44.52	0.00	1637.24	0.00	0.00
Tanakallu	0.00	0.00	42.19	2260.81	222.79	0.00	2525.79	0.00	0.00
Thummala (S)	0.00	4.74	207.52	1906.11	172.63	1.83	2292.83	0.00	0.00
Tummala North	0.00	1.06	100.45	2673.87	118.04	0.98	2894.41	0.00	0.00
Tummalabailu	0.00	2.72	90.34	1316.39	65.96	0.00	1475.41	0.00	0.00
Tummalal South	0.00	1.18	130.37	2962.64	210.76	0.71	3305.65	0.00	0.00
<b>Total</b>	<b>0.00</b>	<b>440.95</b>	<b>5883.02</b>	<b>38912.84</b>	<b>2799.75</b>	<b>6.59</b>	<b>48043.14</b>	<b>-7.47</b>	<b>7.47</b>
<b>Kalyandurg Range</b>									
Beluguppa	0.00	0.00	0.00	11.67	1178.85	0.00	1190.52	0.00	0.00
Dharmapuri	0.00	0.00	0.00	37.79	2564.93	1.27	2603.99	0.00	0.00
Jambugumpala	0.00	0.00	0.00	32.09	1839.09	0.00	1871.18	0.00	0.00
Kalyandurg	0.00	0.00	0.00	3.02	3102.23	1.58	3106.82	0.00	0.00
Kanekal	0.00	2.90	33.32	614.31	640.75	0.00	1291.28	0.00	0.00
Khairevu	0.00	0.00	0.00	553.72	2790.00	1.61	3345.32	-23.56	0.00
Obulapuram	0.00	0.00	0.00	1.33	4226.69	257.64	4485.66	0.00	0.00
Pillalapalli	0.00	0.00	0.00	0.46	1272.60	0.00	1273.06	0.00	0.00
Rayadurg	0.00	0.00	0.00	44.36	3998.15	6.64	4049.15	0.00	0.00
Settur	0.00	0.00	0.00	67.28	1699.49	0.00	1766.78	0.00	0.00
<b>Total</b>	<b>0.00</b>	<b>2.90</b>	<b>33.32</b>	<b>1366.04</b>	<b>23312.77</b>	<b>268.74</b>	<b>24983.76</b>	<b>-23.56</b>	<b>0.00</b>
<b>Penukonda Range</b>									
Gundumala	0.00	0.00	0.00	1062.59	1345.20	0.53	2408.31	0.00	0.00
Guttur	0.00	0.00	0.00	354.91	2730.67	0.00	3085.58	0.00	0.00
Madakasira	0.00	0.00	0.00	976.38	900.47	0.00	1876.85	0.00	0.00
Mandlapalli	0.00	0.00	0.00	173.67	1695.94	0.00	1869.61	-11.41	11.41
Penukonda	0.00	0.00	0.00	736.62	3901.24	0.00	4637.86	0.00	0.00

Table 4.1.3: List of Beats showing Forest Cover with changes.								(Area in Ha)	
BEAT	VDF	MDF	OF	SF	NF	WB	Total	Net Change	Encroachment
Rallapalli	0.00	0.00	1.90	423.21	727.95	0.00	1153.06	6.45	0.00
Rolla	0.00	0.00	0.00	450.00	922.20	0.00	1372.20	0.00	0.00
Somandepalli	0.00	1.23	0.59	591.86	1927.06	0.53	2521.28	0.00	0.00
Yerrakonda North	0.00	0.77	6.40	1440.04	1829.58	0.00	3276.78	-12.1	0.00
Yerrakonda South	0.00	0.00	13.49	1638.15	201.42	0.00	1853.06	-15.56	0.00
<b>Total</b>	<b>0.00</b>	<b>2.00</b>	<b>22.38</b>	<b>7847.42</b>	<b>16181.72</b>	<b>1.06</b>	<b>24054.58</b>	<b>-32.62</b>	<b>11.41</b>
<b>Grand Total</b>	<b>0.00</b>	<b>517.55</b>	<b>7079.70</b>	<b>76727.19</b>	<b>109846.61</b>	<b>389.01</b>	<b>194560.14</b>	<b>-75.17</b>	<b>37.83</b>

2011



2012



Longitude	77.15124 ° E
Latitude	13.89648 ° N
Area in Ha	11.39
Change	Negative
Comp No.	392
Beat	Mandlapalli
Range	Penukonda
Division	Ananathapur



## 4.2 CHITTOOR WEST DIVISION

### 4.2.1 Introduction:

Chittoor West Forest Division lies in the Southern Part of Andhra Pradesh state between latitudes 12° 37' 22" and 13° 59' 37.76"N and longitudes 78° 40' 12" and 79° 08' 35.52" E. Geographical area of the Division is 7944 Km<sup>2</sup> which is 52.32% of the geographical area of the District. Terrain can be roughly divided into Hills and plateaus and Outer slopes and Outliners. The Eastern Ghats traverse this division from South-West to North-East. Palmaner, Punganur, Madanapalli Plateaus are constituents of the Mysore Plateau. The elevation of the Division varies from 305 m on plains to 1377 m on the hills. One of the prominent hills in the Division is Horsley Hill 1314 m above MSL.

Land use pattern of the Division is given in Table 4.2.1

The climate of the Division is equable, healthy and pleasant. The temperatures range from 12°C to 38°C and the average rainfall of the Division is 730 mm.

The soils in the Division are red loamy, red sandy, black clay, black loamy, black sandy and red clay.

The population of the Division is 2.07 million (2011 Census). The per capita forest area is 0.10 Ha & population density is 262 persons per Km<sup>2</sup>.

### 4.2.2 Recorded Forest Area:

The notified forest area of the Division is 2068 Km<sup>2</sup>, which is 26% of the geographical area. Reserved, Protected and Un-classed Forests constitute 1510.5 Km<sup>2</sup> (73%), 550.85 Km<sup>2</sup> (26.64%) and 6.72 Km<sup>2</sup> (0.32%) of the forest area respectively.

As per Champion and Seth's classification, the forests of the Division fall under Dry Tropical South Indian Mixed Deciduous Forests, Southern Thorn Forest Groups & Tropical Dry Evergreen Forests.

### 4.2.3 Protected Area:

There is one Protected Area in the Division, viz., **Koundinya Wildlife Sanctuary** with an extent of 815.50 Km<sup>2</sup>.

### 4.2.4 Community Forest Management:

There are 119 Joint-Forest Protection Committees (JFPCs) or Vana Samrakshana Samities (VSSs) in the Division. An area of 222.34 Km<sup>2</sup> forests, which is 10.8% 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 2012 data(20, Nov 2012) is 1878.14 Km<sup>2</sup> which is **23.64%** of the Geographical area. In terms of forest canopy cover density classes, the Division has **35.02 km<sup>2</sup>** of Very Dense Forests, **1248.65 Km<sup>2</sup>** of Moderately Dense Forests and **594.47 Km<sup>2</sup>** of Open Forests. The area of the Scrub is **141.11 Km<sup>2</sup>**, Non-Forest **69.75 Km<sup>2</sup>** and Water Bodies **0.76 Km<sup>2</sup>**. The distribution of the forest cover of the Division is shown in Fig 4.2.1.

**Table 4.2.1: Land use Pattern**

Land use	Area in Km <sup>2</sup>	Percentage
Forest including Scrub	1807.19	22.75
Agriculture	4377.76	55.11
Land with Scrub	855.53	10.77
Fallow Lands	593.37	7.47
Grasslands	11.69	0.15
Settlements	11.63	0.14
Vegetation outside Forest	88.07	1.11
Water Bodies	198.77	2.50
<b>Total</b>	<b>7944</b>	

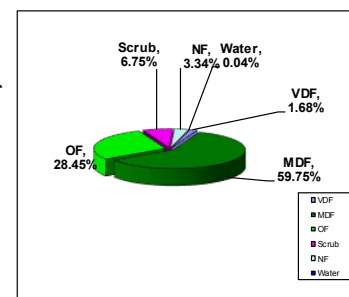


Fig 4.2.1



#### 4.2.6 Change in Forest Cover:

The Satellite images of 2011 and 2012 are shown in Figs 4.2.2 & 4.2.3 respectively.

Comparison of the current forest cover with that of previous assessment year shows a **negative change of 28.48 Ha**. The forest cover change matrix given in Table 4.2.2 reveals that there is decrease of **182.85 Ha** of scrub.

The total positive change (including scrub) is **80.33 Ha** which is on account of growth in raised plantations. The total negative change (including scrub) is **201.96 Ha**. Out of this, **184.34 Ha** is on account of clearance of jungle growth for raising of plantations and **17.62 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 the negative change due to encroachments alone is taken as loss of forest cover. Therefore, **the net loss of forest cover is 17.62 Ha** in the Division.

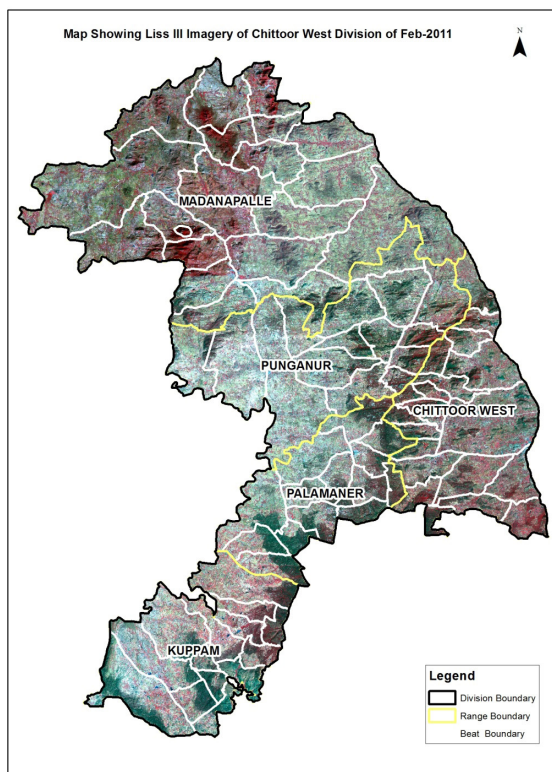


Fig 4.2.2

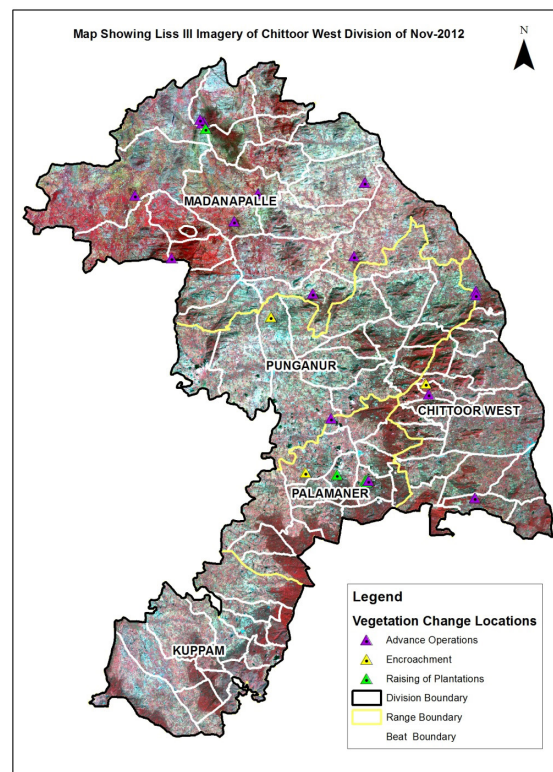


Fig 4.2.3

There are **84 beats** in the division. Negative changes in forest cover are noticed in 13 Beats and Positive Changes are noticed in 4 beats. There are no changes in the remaining 68 Beats.

Details of forest cover changes in the 17 Beats along with other beats mentioned below, are shown in Table 4.2.3.

Table 4.2.2: Forest Cover change matrix							(Area in Km <sup>2</sup> )
2011	2012						Total of 2011
	VDF	MDF	OF	Scrub	NF	WB	
Very Dense Forest	35.02	0.00	0.00	0.00	0.00	0.00	35.02
Moderately Dense Forest	0.00	1248.65	0.00	0.00	0.00	0.00	1248.65
Open Forest	0.00	0.00	593.86	0.28	0.00	0.00	594.14
Scrub	0.00	0.00	0.61	140.64	1.73	0.00	142.98
Non-Forest	0.00	0.00	0.00	0.19	68.02	0.00	68.21
Water	0.00	0.00	0.00	0.00	0.00	0.76	0.76
<b>Total of 2012</b>	<b>35.02</b>	<b>1248.65</b>	<b>594.47</b>	<b>141.11</b>	<b>69.75</b>	<b>0.76</b>	<b>2089.76</b>
<b>Net Change</b>	<b>0.00</b>	<b>0.00</b>	<b>0.33</b>	<b>-1.91</b>	<b>1.57</b>	<b>0.00</b>	

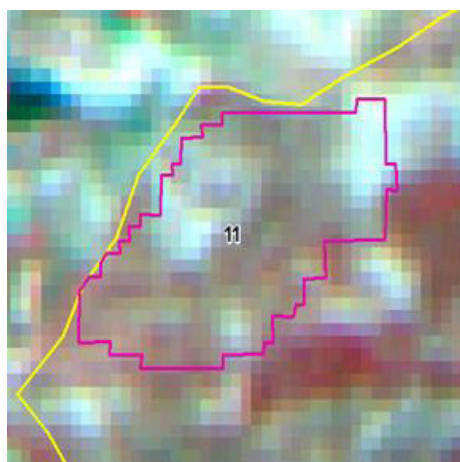
Table 4.2.3: List of Beats showing Forest Cover with changes.									(Area in Ha)
BEAT	VDF	MDF	OF	SF	NF	WB	Total	Net Change	Encroachment
<b>Chittoorwest Range</b>									
Bodabanda	47.98	2585.01	203.32	8.10	4.40	0.00	2848.81	0.00	0.00
Chittapara	419.34	1990.56	9.60	0.00	2.06	0.00	2421.56	0.00	0.00
Gollapalle	29.00	918.51	41.65	2.39	4.21	0.00	995.77	-4.21	1.29
Gundlapalle	143.23	1625.23	237.05	12.74	11.21	0.00	2029.45	0.00	0.00
Irala	87.55	2046.31	384.81	58.10	8.28	0.00	2585.06	0.00	0.00
Kalluru	52.88	2329.89	667.10	67.01	43.04	0.00	3159.92	-28.48	0.00
Kammapalle	53.79	2088.20	78.97	0.51	5.50	0.00	2226.97	0.00	0.00
Keenatampalle	46.57	924.50	81.18	0.52	0.57	0.00	1053.34	0.00	0.00
M.V.Giri	0.00	1360.11	240.98	9.84	2.56	0.00	1613.49	0.00	0.00
Madhavaram	43.05	1217.09	78.05	8.07	5.72	0.00	1351.98	0.00	0.00
Mittoor	5.97	1075.72	269.01	14.11	17.73	0.00	1382.55	0.00	0.00
Nagamvandlapalle	215.61	2779.63	260.54	14.73	9.20	0.00	3279.70	0.00	0.00
Nampalle	77.90	1188.28	234.46	14.42	3.94	0.00	1519.00	0.00	0.00
Rachoor	39.34	1658.13	199.59	14.45	16.75	0.00	1928.25	-10.19	0.00
Ragimanipenta	246.31	1455.91	48.63	1.65	4.95	0.00	1757.45	0.00	0.00
Santhapeta	25.32	2047.31	449.54	52.71	77.23	0.00	2652.11	0.00	0.00
Sarakallu	15.44	1714.84	250.41	18.52	10.52	0.00	2009.72	0.00	0.00
Setteri	133.75	1500.47	260.92	42.46	116.69	0.00	2054.29	0.00	0.00
Thumbakuppam	5.68	1007.25	178.42	48.92	33.34	0.00	1273.59	0.00	0.00
Thumbapalem	37.88	1651.55	42.45	4.00	1.26	0.00	1737.13	0.00	0.00
<b>Total</b>	<b>1726.57</b>	<b>33164.51</b>	<b>4216.68</b>	<b>393.24</b>	<b>379.15</b>	<b>0.00</b>	<b>39880.14</b>	<b>-42.88</b>	<b>1.29</b>
<b>Kuppam Range</b>									
Balla	0.00	1622.77	242.30	21.31	19.43	0.52	1906.33	0.00	0.00
Bommadevarachenulu	49.83	1143.64	1925.57	336.96	840.11	0.75	4296.85	0.00	0.00
Kadapalle	0.00	1028.62	1263.81	23.04	16.79	0.00	2332.25	0.00	0.00
Kangundi	1.95	935.57	400.95	8.54	2.05	0.00	1349.06	0.00	0.00
Kuppum	0.00	459.26	961.78	17.28	3.76	0.00	1442.08	0.00	0.00
Mittapalle	0.58	1687.38	924.66	7.57	3.28	0.00	2623.47	0.00	0.00
Muddanapalle	17.48	1940.77	86.37	11.11	3.62	2.97	2062.32	0.00	0.00
Nadimuru	0.00	1047.07	3271.45	199.89	20.16	0.00	4538.57	0.00	0.00
Naniyala	100.98	3293.60	27.14	1.09	0.00	0.00	3422.81	0.00	0.00
Narayanapuram	72.55	2035.06	240.91	50.50	7.56	7.15	2413.72	0.00	0.00
Nayanur	0.00	1281.08	1056.29	109.30	73.38	2.70	2522.74	0.00	0.00
Pandyalamadugu	46.31	2924.18	109.65	9.75	6.64	0.00	3096.53	0.00	0.00

Table 4.2.3: List of Beats showing Forest Cover with changes.								(Area in Ha)	
BEAT	VDF	MDF	OF	SF	NF	WB	Total	Net Change	Encroachment
Peddavanka	0.00	197.20	1085.20	199.15	254.04	0.00	1735.59	0.00	0.00
Peddur	56.89	2271.39	140.61	1.09	1.38	1.50	2472.86	0.00	0.00
<b>Total</b>	<b>346.56</b>	<b>21867.58</b>	<b>11736.67</b>	<b>996.57</b>	<b>1252.21</b>	<b>15.59</b>	<b>36215.17</b>	<b>0.00</b>	<b>0.00</b>
<b>Madanapalle Range</b>									
Chalimamidi	0.00	315.69	1767.99	350.75	234.49	1.90	2670.82	0.00	0.00
Cheekalabyly	2.38	1766.09	967.03	110.50	144.33	0.00	2990.33	0.00	0.00
Ellutla	5.68	885.24	950.60	212.41	51.18	0.00	2105.10	0.00	0.00
Kalicherla	0.70	170.49	497.46	2353.17	634.73	0.00	3656.55	0.00	0.00
Kalikiri	1.55	1377.59	1838.03	247.50	212.21	0.00	3676.87	-10.80	0.00
Kandlamadugu	0.91	409.14	1194.38	94.86	44.03	0.00	1743.32	0.00	0.00
Kottala	0.00	177.55	1167.21	807.52	1351.99	0.00	3504.27	-17.32	0.00
Marripadu	1.08	194.84	1982.17	387.88	111.60	0.00	2677.58	-16.74	0.00
Nadimicherla	4.81	804.75	1796.90	257.79	99.12	0.00	2963.36	0.00	0.00
Nerdikonda	0.00	10.89	135.66	2052.92	253.32	39.85	2492.65	0.00	0.00
Noorukuppalakonda	0.00	1114.90	1853.27	266.38	167.60	1.49	3403.64	0.00	0.00
Penchupadu	16.38	2078.70	727.05	104.27	92.32	0.00	3018.72	0.00	0.00
Plateau	11.08	435.38	148.61	17.98	14.60	0.00	627.65	0.00	0.00
Ramaganipalle	0.00	97.68	1175.24	405.13	74.83	0.00	1752.88	-17.42	0.00
Sangasamudram	0.00	386.54	1262.18	268.57	211.19	0.00	2128.47	0.00	0.00
Tarigonda	2.71	986.21	1339.14	190.47	95.53	3.14	2617.19	0.00	0.00
Tavalam	3.19	2494.13	670.91	115.41	39.90	0.00	3323.55	-16.23	0.00
Thambalpalle	0.00	187.52	2340.65	542.68	64.22	0.00	3135.07	5.37	0.00
Thettu	0.57	1299.35	1463.88	88.54	29.37	0.00	2881.70	-11.10	0.00
Vepurikota	0.89	59.74	397.48	2156.43	379.59	0.00	2994.12	-9.05	0.00
<b>Total</b>	<b>51.91</b>	<b>15252.39</b>	<b>23675.84</b>	<b>11031.16</b>	<b>4306.17</b>	<b>46.37</b>	<b>54363.85</b>	<b>-93.29</b>	<b>0.00</b>
<b>Palamaner Range</b>									
Doddipalle	1.03	1790.04	324.62	33.02	44.23	1.66	2194.58	23.79	0.00
Engamvaripalle	0.63	1594.23	1395.22	81.64	10.83	0.00	3082.54	0.00	0.00
Jagamarla	5.79	3494.07	289.51	17.28	18.97	0.00	3825.62	0.00	0.00
Kalavapalle	21.46	2509.73	379.27	55.61	42.54	1.26	3009.82	26.96	0.00
Keelapatla	81.69	3460.98	311.08	37.71	45.85	0.00	3937.30	0.00	0.00
Kolamasinapale	2.64	1613.12	499.74	59.05	30.55	1.31	2206.40	0.00	0.00
M.Kothur	0.69	3342.06	397.05	15.92	20.34	0.21	3776.26	0.00	0.00
Nellipatla	13.30	2881.01	581.34	39.29	57.73	3.04	3575.71	0.00	0.00
P.N.D North	0.00	935.34	1710.57	55.32	10.87	0.00	2712.10	0.00	0.00
P.N.D South	30.40	2781.34	385.34	16.08	5.55	0.00	3218.71	0.00	0.00
Palamaner	4.93	2203.11	442.82	39.75	10.87	0.00	2701.48	23.79	0.00
Pathikonda	0.00	372.35	1254.41	220.13	81.41	0.00	1928.29	-14.50	14.50
Tekumanda	18.89	2749.84	77.04	7.11	1.89	0.00	2854.76	0.00	0.00
Thotakanuma	0.52	556.26	1968.01	82.28	44.00	0.00	2651.06	0.00	0.00
<b>Total</b>	<b>181.96</b>	<b>30283.46</b>	<b>10016.00</b>	<b>760.16</b>	<b>425.62</b>	<b>7.48</b>	<b>41674.62</b>	<b>60.04</b>	<b>14.50</b>
<b>Punganur Range</b>									
Arantlapalle	2.47	1304.79	929.40	43.99	17.64	0.00	2298.29	0.00	0.00
Chandramakulapalle	0.74	885.67	871.18	98.77	133.43	1.20	1990.98	-1.83	1.83
Charala	25.79	1320.10	383.83	28.73	32.77	0.00	1791.22	0.00	0.00
Chembakuru	3.59	990.05	373.93	58.08	22.77	0.00	1448.41	0.00	0.00
Gollapalle	302.16	2280.67	324.26	20.13	28.17	0.00	2955.39	0.00	0.00

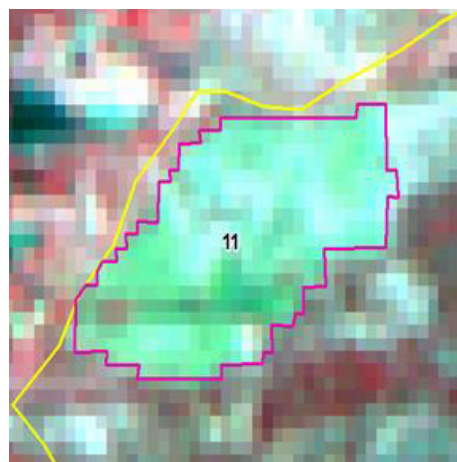


Table 4.2.3: List of Beats showing Forest Cover with changes.								(Area in Ha)	
BEAT	VDF	MDF	OF	SF	NF	WB	Total	Net Change	Encroachment
Gurujularipalle	1.26	1022.98	371.75	12.38	10.68	0.00	1419.06	0.00	0.00
Kanduru	2.57	2133.96	946.72	73.88	68.99	5.02	3231.14	0.00	0.00
Madirimalai East	30.98	2188.55	810.59	34.32	4.91	0.00	3069.36	0.00	0.00
Madirimalai West	34.03	1494.98	430.97	44.78	21.65	0.00	2026.42	0.00	0.00
Muthukur	0.00	226.18	718.05	148.29	48.66	0.00	1141.18	-19.88	0.00
Petur	95.24	1586.39	304.88	57.11	21.09	0.00	2064.71	0.00	0.00
Rampalle	488.38	2155.31	85.21	8.06	2.63	0.00	2739.59	0.00	0.00
Rayolpeta	14.48	1962.49	455.85	37.99	35.68	0.00	2506.50	0.00	0.00
Somala	0.00	2038.07	1398.51	89.60	59.06	0.00	3585.24	0.00	0.00
Upparapalle	192.03	2464.56	220.52	15.76	11.20	0.00	2904.07	0.00	0.00
Valligatla	0.69	241.75	1175.47	157.48	93.14	0.00	1668.54	0.00	0.00
<b>Total</b>	<b>1194.40</b>	<b>24296.51</b>	<b>9801.13</b>	<b>929.36</b>	<b>612.45</b>	<b>6.22</b>	<b>36840.07</b>	<b>-21.71</b>	<b>1.83</b>
<b>Grand Total</b>	<b>3501.40</b>	<b>124864.45</b>	<b>59446.31</b>	<b>14110.50</b>	<b>6975.59</b>	<b>75.67</b>	<b>208973.85</b>	<b>-97.84</b>	<b>17.62</b>

2011



2012



Longitude	78.49383 ° E
Latitude	13.66961 ° N
Area in Ha	12.25
Change	Negative
Comp No.	29
Beat	Ramaganipalle
Range	Madanapalle
Division	Chittor-West



## 4.3 ATMAKUR WLM DIVISION

### 4.3.1 Introduction:

Atmakur WLM Forest Division lies in the north-eastern part of Kurnool District between latitudes 15° 39' 3.6" and 16° 8' 52.8"N and longitudes 78° 15' 1.8" and 78° 55' 57" E. Geographical area of the Division is 2154 Km<sup>2</sup> which is 12.20 % of the total area of the District.

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

The climate of this Division is generally dry with temperatures ranging from 20°C to 40°C and the annual rainfall is about 670 mm, received mainly from Southwest monsoon.

Important minerals and rocks found in the Division are iron, lime stone, steatite, barytes, quartz, asbestos, diamond and black & pink granite. The soil types found mainly are Black cotton (East and North Western), Red (South Eastern) and Brown sandy loam.

The population of the Division is 0.30 million (2011 Census). The per capita forest area is 0.42Ha. The Population density is 141 persons per Km<sup>2</sup>.

**Table 4.3.1: Land use Pattern**

Land use	Area in Km <sup>2</sup>	Percentage
Forest including Scrub	868.80	40.33
Agriculture	784.92	36.44
Land with Scrub	77.13	3.58
Fallow Lands	22.93	1.07
Grasslands	30.68	1.42
Settlements	12.89	0.60
Vegetation outside Forest	103.96	4.83
Water bodies	252.69	11.73
<b>Total</b>	<b>2154.00</b>	

### 4.3.2 Recorded Forest Area:

Area of the notified forest of the Division is **1288.81 Km<sup>2</sup>** which is 59.83 % of the geographical area. Reserved and Un-classed Forests constitute 1204.44 Km<sup>2</sup> (93.45%) and 84.37 Km<sup>2</sup> (6.54%) of the forest area respectively.

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

### 4.3.3 Protected Area:

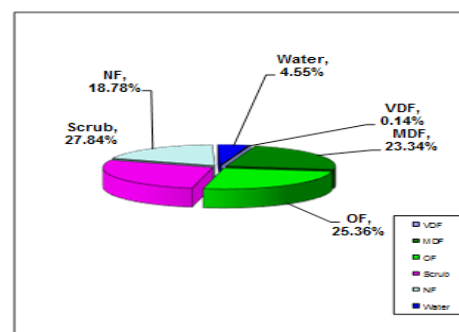
The Atmakur Division comprises of Gundla Brahmeswaram Wildlife Sanctuary (GBM), Nagarjuna Sagar Tiger Reserve (NSTR) and Rollapadu WLS. Out of 1288.81 Km<sup>2</sup> of forest area, an area of 536.16 Km<sup>2</sup> is included in Nagarjuna Sagar Tiger Reserve (NSTR), 277.88 Km<sup>2</sup> in Gundla Brahmeswaram Wildlife Sanctuary (GBM) & 5.20 Km<sup>2</sup> in Rollapadu Wild Life Sanctuary.

### 4.3.4 Community Forest Management:

There are 47 Vana Samrakshana Samities (VSSs) in the Division. An area of 135.31 Km<sup>2</sup> forests, which is 10.5 % of the notified forests, 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 2012 data (OCT-2012) is **627.95 Km<sup>2</sup>** which is **29.15 %** of the Geographical area. In terms of the forest canopy cover density classes, the Division has **1.74 Km<sup>2</sup>** of Very Dense Forests, **300.11 Km<sup>2</sup>** of Moderately Dense Forests and **326.10 Km<sup>2</sup>** of Open Forests. The area of the Scrub is **357.92 Km<sup>2</sup>**, Non-Forests **241.43 Km<sup>2</sup>** and Water Bodies is **58.47 Km<sup>2</sup>**. The distribution of the forest cover of the Division is shown in Fig 4.3.1



**Fig 4.3.1**



### 4.3.6 Change in Forest cover:

The satellite images of 2011 and 2012 are shown in Figs 4.3.2 & 4.3.3 respectively.

Comparison of the current forest cover with that of previous assessment year shows **no change in the forest cover**. The forest cover change matrix given in Table 4.3.2.

Therefore, there is **no net loss of forest cover** in the Division.

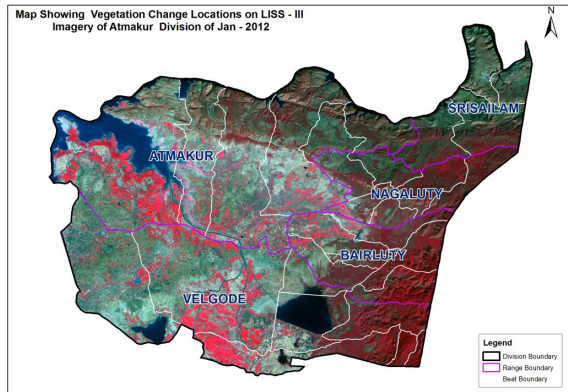


Fig 4.3.2

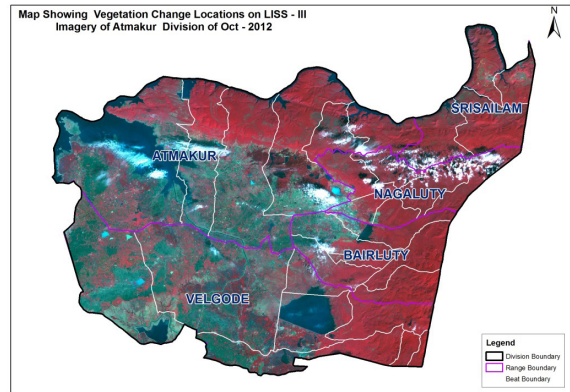


Fig 4.3.3

There are 30 Beats in the Division and there are no changes in the forest cover in any of the 30 Beats during the period.

The forest cover change matrix is given in Table 4.3.2

Table 4.3.2: Forest Cover change matrix							(Area in Km <sup>2</sup> )	
2011	2012						Total of 2011	
	VDF	MDF	OF	Scrub	NF	WB		
Very Dense Forest	1.74	0.00	0.00	0.00	0.00	0.00	1.74	
Moderately Dense Forest	0.00	300.11	0.00	0.00	0.00	0.00	300.11	
Open Forest	0.00	0.00	326.10	0.00	0.00	0.00	326.10	
Scrub	0.00	0.00	0.00	357.92	0.00	0.00	357.92	
Non-Forest	0.00	0.00	0.00	0.00	241.43	0.00	241.43	
Water	0.00	0.00	0.00	0.00	0.00	58.47	58.47	
<b>Total of 2012</b>	<b>1.74</b>	<b>300.11</b>	<b>326.10</b>	<b>357.92</b>	<b>241.43</b>	<b>58.47</b>	<b>1285.77</b>	
<b>Net Change</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>		

Table 4.3.3 : List of Beats showing Forest Cover with changes.								(Area in Ha)	
BEAT	VDF	MDF	OF	SF	NF	WB	Total	Net Change	Encroachment
<b>Atmakur Range</b>									
Atmakur	0.00	360.42	2905.61	4156.95	1691.62	668.89	9783.48	0.00	0.00
Gummadapuram	0.00	7.95	671.98	2934.49	1361.80	565.52	5541.74	0.00	0.00
Guvvalakuntla East	0.00	116.75	1054.77	1703.84	1948.98	53.38	4877.72	0.00	0.00
Guvvalakuntla West	0.00	58.09	1788.17	3144.66	540.83	459.36	5991.11	0.00	0.00



**Table 4.3.3 : List of Beats showing Forest Cover with changes.**

**(Area in Ha)**

BEAT	VDF	MDF	OF	SF	NF	WB	Total	Net Change	Encroachment
Musalimadugu	0.00	12.30	176.62	2466.91	2109.20	72.88	4837.90	0.00	0.00
Sivapuram	0.00	477.43	2357.12	2905.00	898.70	192.01	6830.26	0.00	0.00
<b>Total</b>	<b>0.00</b>	<b>1032.94</b>	<b>8954.26</b>	<b>17311.85</b>	<b>8551.12</b>	<b>2012.04</b>	<b>37862.21</b>	<b>0.00</b>	<b>0.00</b>
<b>Bairluty Range</b>									
Bairluty	0.00	1354.95	1579.93	419.51	69.73	1.75	3425.872	0.00	0.00
Nallakalva	0.00	715.50	1438.66	773.35	746.15	0.00	3673.652	0.00	0.00
P.A.Puram North	0.00	688.55	563.43	532.52	330.95	0.00	2115.436	0.00	0.00
P.A.Puram South	0.00	514.33	506.50	487.12	115.77	0.00	1623.727	0.00	0.00
Pasurutla	20.13	3883.27	1698.55	208.33	13.33	0.00	5823.604	0.00	0.00
Rudracode	78.36	4000.65	846.73	424.52	36.78	0.00	5387.038	0.00	0.00
<b>Total</b>	<b>98.49</b>	<b>11157.25</b>	<b>6633.80</b>	<b>2845.34</b>	<b>1312.70</b>	<b>1.75</b>	<b>22049.329</b>	<b>0.00</b>	<b>0.00</b>
<b>Nagaluty Range</b>									
Indireshvaram East	0.00	276.46	1154.37	1397.41	902.93	0.71	3731.88	0.00	0.00
Indireshvaram West	0.00	332.48	1269.81	1459.66	1145.09	7.47	4214.51	0.00	0.00
Nagaluty	0.00	284.00	1183.55	801.56	130.12	0.00	2399.22	0.00	0.00
Pangidi East	0.00	2061.30	2531.57	191.08	7.50	0.00	4791.46	0.00	0.00
Pangidi West	0.00	2076.56	2090.75	546.01	14.28	0.00	4727.60	0.00	0.00
Venkatapuram	0.00	141.49	1074.60	702.26	259.77	0.00	2178.11	0.00	0.00
<b>Total</b>	<b>0.00</b>	<b>5172.29</b>	<b>9304.66</b>	<b>5097.97</b>	<b>2459.68</b>	<b>8.18</b>	<b>22042.79</b>	<b>0.00</b>	<b>0.00</b>
<b>Srisailam Range</b>									
Pechuruvu East	0.00	784.83	2175.46	2525.18	2930.10	147.06	8562.62	0.00	0.00
Pechuruvu West	0.00	677.96	2006.98	2570.26	1445.37	182.42	6882.98	0.00	0.00
Srisailam	0.00	1.87	8.93	1396.96	1408.36	348.89	3165.01	0.00	0.00
Sundipenta	0.00	27.44	54.62	1374.68	1265.69	67.17	2789.59	0.00	0.00
<b>Total</b>	<b>0.00</b>	<b>1492.09</b>	<b>4245.98</b>	<b>7867.08</b>	<b>7049.51</b>	<b>745.53</b>	<b>21400.20</b>	<b>0.00</b>	<b>0.00</b>
<b>Velgode Range</b>									
Abbarajukunta	22.52	3202.08	908.91	247.82	22.84	0.00	4404.16	0.00	0.00
G.B.M. East	12.42	788.73	29.46	6.54	0.00	0.00	837.15	0.00	0.00
G.B.M. West	18.02	1465.05	5.90	0.00	0.00	0.00	1488.97	0.00	0.00
Pangidi	22.73	5168.81	1218.11	609.27	62.89	13.06	7094.89	0.00	0.00
Rollapadu	0.00	0.85	1.88	11.85	322.50	2.99	340.07	0.00	0.00
Velgode North	0.00	25.67	399.59	895.68	1589.80	277.94	3188.67	0.00	0.00
Velgode South	0.00	504.41	862.20	440.85	596.14	2780.14	5183.73	0.00	0.00
Velgode West	0.00	0.72	44.52	457.75	2176.19	5.70	2684.87	0.00	0.00
<b>Total</b>	<b>75.70</b>	<b>11156.31</b>	<b>3470.56</b>	<b>2669.76</b>	<b>4770.36</b>	<b>3079.83</b>	<b>25222.52</b>	<b>0.00</b>	<b>0.00</b>
<b>Grand Total</b>	<b>174.19</b>	<b>30010.88</b>	<b>32609.26</b>	<b>35792.00</b>	<b>24143.37</b>	<b>5847.34</b>	<b>128577.05</b>	<b>0.00</b>	<b>0.00</b>



## 4.4 MARKAPUR WLM DIVISION

(Included WLM Nagarjuna Sagar area)

### 4.4.1 Introduction:

Markapur WLM Forest Division lies in the south-eastern part of Prakasham district between latitudes 15° 23' 1" and 16° 18' 16" N and longitudes 78° 47' 48" and 79° 57' 56" E. Geographical area of the Division is 7,218 Km<sup>2</sup> which is 25.1 % of the area of the District. The seasonal rivers like Gundlakamma, Sagileru, Musi, Paleru and Manneru flow through the Division. The Gundlakamma river rises in Nallamala hills and the famous Cumbum Tank is formed across this river.

Land use pattern of the Division is given in Table 4.4.1

The climate of this Division is dry and salubrious, temperatures ranging from 19°C to 40°C; the annual rainfall is about 871 mm, received mainly from Southwest monsoons.

Sandstone mixed with quartzite and occasional shales are the characteristic rock formations on the Veligondas and at their extremes, bordering Kanigiri, the rocks gradually change into Gneisses or Granite composition. Outcrops of Barytes and Manganese ores occur in Veligondas. The soil types found mainly are red loamy, black cotton, sandy loam and sandy.

Population of the Division is 0.86 million (2011 Census), per capita forest area is 0.26 Ha and the population density is 155 persons per Km<sup>2</sup>.

**Table 4.4.1: Land use Pattern**

Land use*	Area in Km <sup>2</sup>	Percentage
Forest including Scrub	2014.3	27.91
Agriculture	4267.32	59.12
Land with Scrub	534.29	7.40
Fallow Lands	111.67	1.55
Grasslands	13.84	0.19
Settlements	31.10	0.43
Vegetation outside Forest	188.96	2.62
Water bodies	56.53	0.78
<b>Total</b>	<b>7218.00</b>	

### 4.4.2 Recorded Forest Area:

The notified forest area of the Division is **2476.39 Km<sup>2</sup>** which is 34.30% of the geographical area. The status of entire forest area is Reserved Forest.

As per Champion and Seth's classification the forests of Division fall under Southern Tropical dry deciduous, as the predominant and climatic climax forest in the Division. The Southern Tropical Thorn Forest also occurs in low elevations and in plains.

\*Only the extent of Markapur was shown, Vijayapuri south range details were not included.

### 4.4.3 Protected Area:

Parts of 2 Protected Areas, viz., the Nagarjuna Sagar Srisailam Tiger Reserve (NSTR) and Gundla Brahmeswaram (GBM) Wild Life Sanctuary, fall in the Division. An area of 1039.51 Km<sup>2</sup> is included in the Nagarjuna Sagar Srisailam Tiger Reserve and 55.45 Km<sup>2</sup> in the Gundla Brahmeswaram Wild Life Sanctuary (GBM).

### 4.4.4 Community Forest Management:

There are 93 Vana Samrakshana Samities (VSSs) in the Division. An area of 347.14 Km<sup>2</sup> forests, which is 14.01 % of the notified forests, 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 2012 data (Dec-2012) is **1397.38 Km<sup>2</sup>** which is **19.35%** of the geographical area. In terms of the forest cover canopy density classes the Division has **7.00 Km<sup>2</sup>** of Very Dense Forests, **207.36 Km<sup>2</sup>** of Moderately Dense Forests and **1183.02 Km<sup>2</sup>** of Open Forests. The area of the Scrub is **1148.03 Km<sup>2</sup>**, Non-Forest **49.39 Km<sup>2</sup>** and Water Bodies **25.95 Km<sup>2</sup>**. The distribution of the forest cover of the Division is shown in Fig 4.4.1

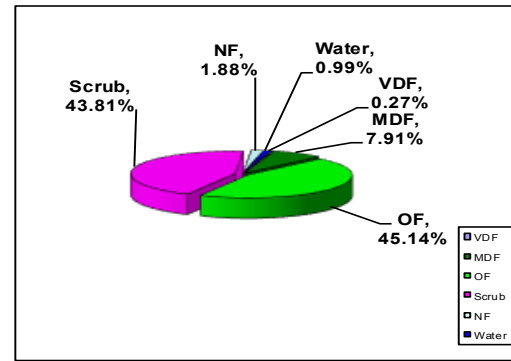


Fig. 4.4.1

#### 4.4.6 Change in Forest Cover:

The satellite images of 2011 and 2012 are shown in Fig 4.4.2 & 4.4.3 respectively and the changes between this Period are shown on the image of 2012.

Comparison of the current forest cover with that of previous assessment year shows a **negative change of 8.27 Ha**. The forest cover change matrix given in Table 4.4.2 reveals that there is a decrease of **8.26 Ha** of open forest and increase of **37.66 Ha** of scrub.

The total negative change (including scrub) is of **138.83 Ha**. Out of this **31.00 Ha** is on account of clearance of jungle growth for raising of plantations and **107.83 Ha** is on account of encroachment. Positive change (including scrub) is **168.22 Ha** on account of growth in raised plantations, 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 on account of encroachments is taken as loss of forest cover. Therefore the **net loss of forest cover is 107.83 Ha** only.

There are 48 Beats in the Division. Negative changes in forest cover are noticed in 8 Beats and Positive changes in forest cover are in 3 Beats. There are no changes in the remaining 37 Beats.

Details of forest cover changes in these 11 Beats and other 37 Beats mentioned above are shown in Table 4.4.3.

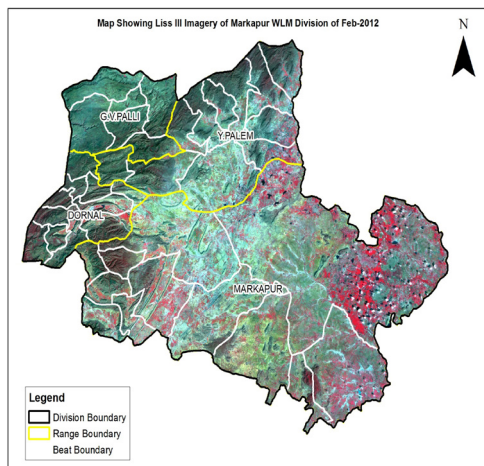


Fig 4.4.2

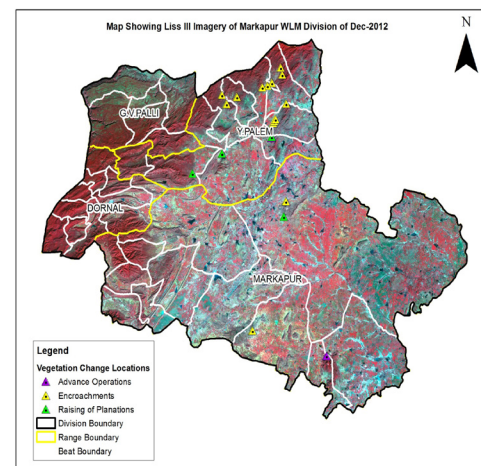


Fig 4.4.3

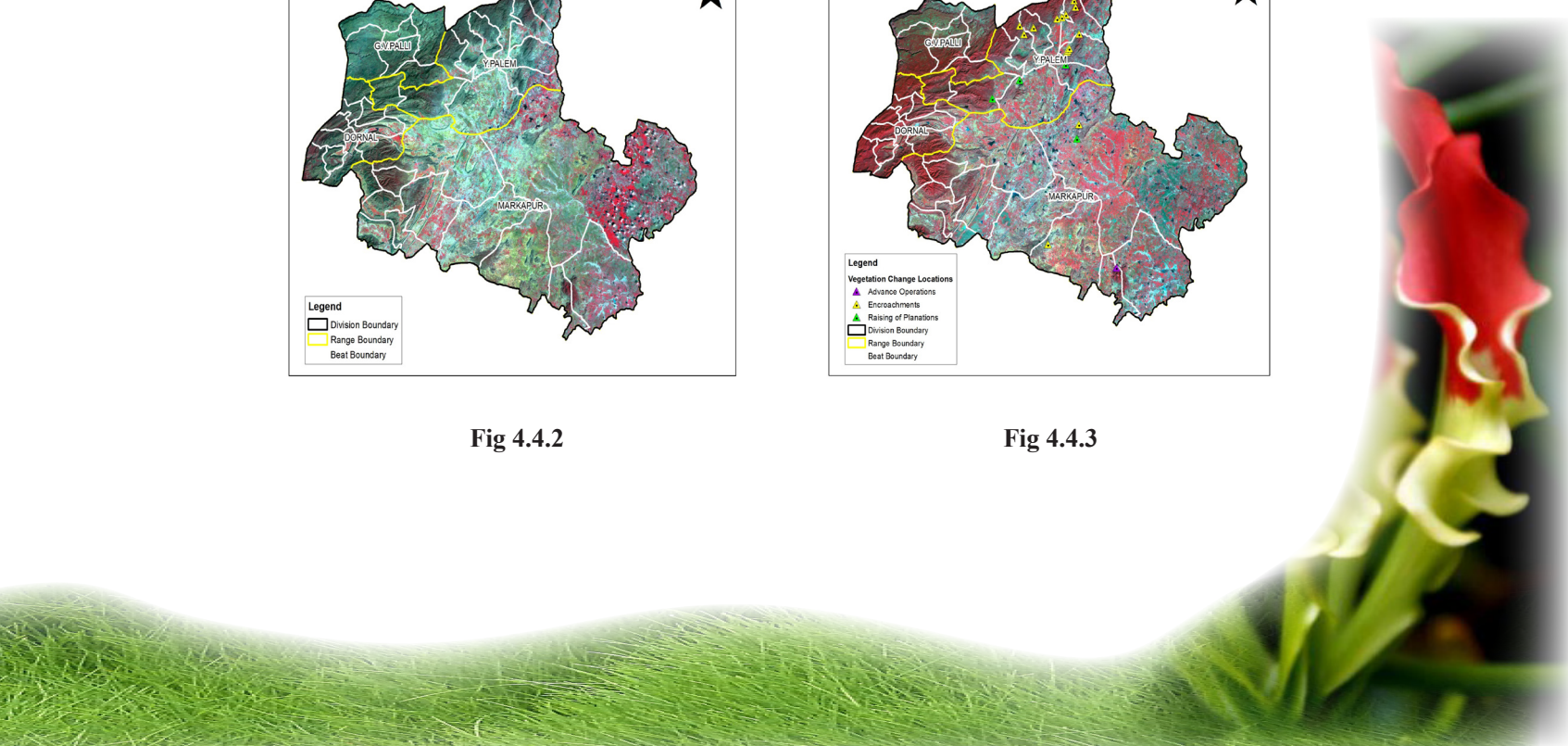




Table 4.4.2: Forest Cover change matrix							(Area in Km <sup>2</sup> )
2011	2012						Total of 2011
	VDF	MDF	OF	Scrub	NF	Water	
Very Dense Forest	7.00	0.00	0.00	0.00	0.00	0.00	7.00
Moderately Dense Forest	0.00	207.36	0.00	0.00	0.00	0.00	207.36
Open Forest	0.00	0.00	1183.02	0.00	0.08	0.00	1183.10
Scrub	0.00	0.00	0.00	1146.35	1.31	0.00	1147.66
Non-Forest	0.00	0.00	0.00	1.68	48.00	0.00	49.68
Water	0.00	0.00	0.00	0.00	0.00	25.95	25.95
<b>Total of 2012</b>	<b>7.00</b>	<b>207.36</b>	<b>1183.02</b>	<b>1148.03</b>	<b>49.39</b>	<b>25.95</b>	<b>2620.75</b>
Net Change	0.00	0.00	-0.08	0.37	-0.29	0.00	

Table 4.4.3: List of Beats showing Forest Cover with changes.								(Area in Ha)	
BEAT	VDF	MDF	OF	SF	NF	WB	Total	Net Change	Encroachment
<b>Dornal Range</b>									
Ch.Mantanala	78.81	2112.54	3457.55	756.98	4.44	0.00	6410.32	0.00	0.00
Chilakacherla	12.37	1377.36	4516.83	713.25	72.29	0.00	6692.10	0.00	0.00
Chinnarutla	0.00	71.63	3146.98	2252.11	2.17	0.00	5472.89	0.00	0.00
Chintala	11.91	362.32	3027.80	482.11	0.82	0.00	3884.97	0.00	0.00
Edavalli	0.00	297.42	1597.24	421.78	0.00	0.00	2316.44	0.00	0.00
Nallaguntla	3.16	342.81	2149.31	884.97	49.18	0.00	3429.43	0.00	0.00
P. Bommalapuram	1.64	96.01	821.97	842.41	0.00	0.00	1762.04	0.00	0.00
Peddachama	8.89	1065.54	1928.59	27.58	0.00	0.00	3030.60	0.00	0.00
Peddamantanala	6.20	1372.28	3425.67	241.09	0.00	0.00	5045.23	0.00	0.00
Tummalabailu	2.29	235.49	2233.03	395.60	0.00	0.00	2866.41	0.00	0.00
Y.Cheropalli	0.00	262.37	3556.78	1306.91	15.40	6.69	5148.15	0.00	0.00
<b>Total</b>	<b>125.28</b>	<b>7595.78</b>	<b>29861.74</b>	<b>8324.80</b>	<b>144.29</b>	<b>6.69</b>	<b>46058.57</b>	<b>0.00</b>	<b>0.00</b>
<b>G.v.palli Range</b>									
G.V.Palli	11.19	252.74	5582.42	1764.04	5.70	1.82	7617.91	0.00	0.00
Guttalachenu	9.89	71.38	615.22	11737.28	174.18	480.92	13088.87	0.00	0.00
Nekkanti	8.86	107.26	1824.90	13726.35	144.89	37.54	15849.80	0.00	0.00
Palutla	1.55	48.34	519.94	3889.39	23.98	1.81	4485.01	0.00	0.00
Regumanipenta	23.38	546.74	7002.44	13142.10	55.71	221.01	20991.37	0.00	0.00
<b>Total</b>	<b>54.87</b>	<b>1026.47</b>	<b>15544.92</b>	<b>44259.15</b>	<b>404.45</b>	<b>743.11</b>	<b>62032.97</b>	<b>0.00</b>	<b>0.00</b>
<b>Markapur Range</b>									
Bommilingam	2.56	655.46	2377.06	866.29	0.94	0.00	3902.30	0.00	0.00
Donkaonda	0.00	96.43	2069.04	1674.85	50.84	0.00	3891.17	0.00	0.00
Gotlagattu	0.00	196.03	2491.24	1169.52	241.07	0.00	4097.87	-6.69	6.69

Table 4.4.3: List of Beats showing Forest Cover with changes.								(Area in Ha)	
BEAT	VDF	MDF	OF	SF	NF	WB	Total	Net Change	Encroachment
Gottipadia	4.62	666.32	4516.83	626.42	0.00	0.00	5814.20	0.00	0.00
Gundamcherla	39.06	3131.09	2856.38	76.79	0.00	0.00	6103.32	0.00	0.00
Kalanuthala	7.11	781.74	3416.22	1614.43	46.72	0.00	5866.21	0.00	0.00
Kaluzuvvalapadu	0.00	168.76	1855.38	1750.46	50.96	1.94	3827.49	0.00	0.00
Magutur	12.04	607.26	3238.82	1312.30	41.65	0.00	5212.06	0.00	0.00
Nagulavaram	0.00	100.90	1727.07	828.62	6.74	0.00	2663.34	0.00	0.00
Peddarikatla	170.65	1342.32	1211.02	296.33	32.81	0.00	3053.13	-23.14	0.00
Podili	92.39	1082.54	970.74	222.09	0.00	0.00	2367.76	0.00	0.00
Potlapadu	49.98	245.81	1681.84	3447.87	1496.49	21.01	6942.98	119.63	11.49
<b>Total</b>	<b>378.41</b>	<b>9074.66</b>	<b>28411.61</b>	<b>13885.97</b>	<b>1968.22</b>	<b>22.95</b>	<b>53741.81</b>	<b>89.80</b>	<b>18.18</b>
<b>V.p.south Range</b>									
Gangalgunta	3.14	112.68	1602.49	3616.53	29.11	217.50	5581.44	0.00	0.00
Gottipalli	38.16	55.61	113.28	3019.25	157.25	364.70	3748.24	0.00	0.00
Kandlgunta	5.82	10.52	46.21	1591.49	154.36	0.00	1808.40	0.00	0.00
Koppunuru	4.92	12.07	82.55	5059.89	935.65	628.13	6723.21	0.00	0.00
Nagulavaram	0.00	6.69	21.40	1237.95	49.09	7.92	1323.04	0.00	0.00
Pasuvemula	4.53	19.44	49.95	2779.43	201.56	2.86	3057.76	0.00	0.00
Sirigiripadu	35.90	184.76	4526.54	2487.05	0.77	0.00	7235.02	0.00	0.00
Tummurukota	19.67	72.73	125.01	2564.08	202.30	0.00	2983.80	0.00	0.00
Zuvuku	8.42	26.14	34.83	1578.83	226.01	593.69	2467.92	0.00	0.00
<b>Total</b>	<b>120.55</b>	<b>500.63</b>	<b>6602.25</b>	<b>23934.50</b>	<b>1956.10</b>	<b>1814.80</b>	<b>34928.82</b>	<b>0.00</b>	<b>0.00</b>
<b>Y.palem Range</b>									
Akkapalem	0.00	379.05	5956.94	858.40	0.00	0.00	7194.39	0.00	0.00
Boyalapalli	0.00	10.05	323.46	3402.37	5.66	0.00	3741.54	3.00	0.00
Kolukula	5.16	437.19	5995.87	3668.03	3.81	0.00	10110.06	29.99	0.00
Komarolu	9.97	121.35	3672.74	3041.85	39.61	0.00	6885.53	-11.61	11.61
Mallapalem	0.00	30.70	2516.53	2084.36	261.44	0.00	4893.02	-6.44	6.44
Naidupalem	0.00	2.09	764.41	1089.12	9.84	0.00	1865.45	-3.75	0.00
Pullalacheruvu	0.00	754.99	3802.34	845.07	25.38	0.00	5427.79	-5.05	5.05
Rentapalli	0.00	6.02	1014.74	2537.65	62.95	0.00	3621.36	-61.02	61.02
T.R.Chervu	5.82	126.96	4209.61	3743.52	3.24	0.00	8089.15	0.00	0.00
Veerabhadrapuram	0.00	339.04	4644.99	1235.97	3.14	7.19	6230.33	0.00	0.00
Venkatareddypalli	0.00	331.11	4979.24	1893.29	50.61	0.00	7254.25	-5.53	5.53
<b>Total</b>	<b>20.95</b>	<b>2538.55</b>	<b>37880.85</b>	<b>24399.64</b>	<b>465.69</b>	<b>7.19</b>	<b>65312.86</b>	<b>-60.41</b>	<b>89.65</b>
<b>Grand Total</b>	<b>700.05</b>	<b>20736.08</b>	<b>118301.37</b>	<b>114804.05</b>	<b>4938.75</b>	<b>2594.73</b>	<b>262075.02</b>	<b>29.39</b>	<b>107.83</b>



## 4.5 GIDDALUR DIVISION

### 4.5.1 Introduction:

Giddalur Forest Division lies in the south-eastern part of Prakasham District between latitudes 14° 57' 46" and 16° 09' 48" N and longitudes 78° 44' 16" and 80° 28' 35" E. Geographical Area of the Division is 10,408.00 Km<sup>2</sup> which is 59.04% of the area of the District. The Rivers in this division are Gundlakamma, Sagileru, Musi, Paleru and Manneru. The Gundlakamma River rises in Nallamala hills and the Cumbum Tank is formed across this river.

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

The climate of this Division is dry and salubrious; the temperature ranges from 19°C to 40°C and the annual rainfall is about 871 mm received mainly from Southwest monsoon.

The rocks in the Division are Sandstone mixed with quartzite. Occasional shales are the characteristic rock formations on the Veligonda and at their extremes bordering Kanigiri, the rocks gradually change into Gneisses or Granite composition. Outcrops of Barytes and Manganese ores also occur in Veligonda. The soil types found mainly are red loamy, Black cotton, sandy loam and sandy soils.

Population of the Division is 2.53million (2011 Census); per capita forest area is 0.09Ha and the population density 209 persons per Km<sup>2</sup>.

### 4.5.2 Recorded Forest Area:

The notified forest area of the Division is 1,948.60 Km<sup>2</sup> which is 18.72% of the geographical area. Reserved, Protected and Un-classed Forests constitute 1908.69 Km<sup>2</sup> (97.95%) and 39.91 Km<sup>2</sup> (2.09%) of the forest area respectively.

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

### 4.5.3 Protected Area:

A part of one Protected Area, the Gundla Brahmeswaram (GBM) Wildlife Sanctuary falls in the Division. An area of 444.76 Km<sup>2</sup> of the Division is included in this WLS.

### 4.5.4 Community Forest Management:

There are 110 Vanasamrakshana Samities (VSSs) in the Division. An area of 287.08 Km<sup>2</sup> forests, which is 19.16 % of the notified forests, is under the management of VSSs.

### 4.5.5 Forest Cover:

The Forest cover in the Division based on the interpretation of IRS R2 LISS III 2012 data (Nov/Dec 2012) is **1396.02 Km<sup>2</sup>** which is 13.41 % of the Geographical area. In terms of the forest canopy cover density classes, the Division has **24.64 Km<sup>2</sup>** of Very Dense Forests, **468.06 Km<sup>2</sup>** of Moderately Dense Forests and **903.32 Km<sup>2</sup>** of Open Forests. The area of the Scrub is **779.63 Km<sup>2</sup>**, Non-Forests **31.22 Km<sup>2</sup>** and Water Bodies **1.34 Km<sup>2</sup>**. The distribution of the forest cover of the division is shown in Fig 4.5.1.

### 4.5.6 Change in Forest Cover:

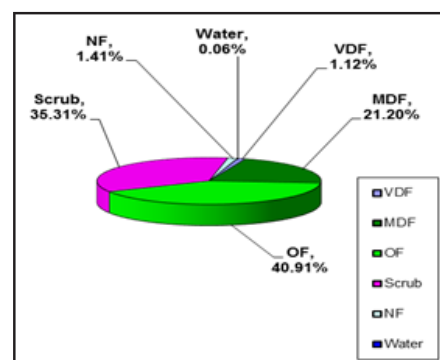
The satellite images of 2011 and 2012 are shown in Figs 4.5.2 & 4.5.3 respectively and the Forest Cover changes during this period are shown on the image of 2012.

Comparison of the current forest cover with that of previous assessment year shows negative change of 4.68 Ha in open forest.

The total positive change (including scrub) is 77.75 Ha. This 77.75 Ha is on account of growth in raised plantations. The total

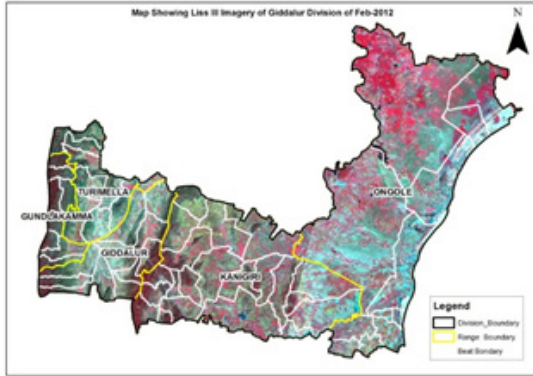
**Table 4.5.1: Land use Pattern**

Land use	Area in Km <sup>2</sup>	Percentage
Forest including Scrub	1944.51	18.68
Agriculture	7164.53	68.84
Land with Scrub	618.70	5.94
Fallow Lands	100.77	0.97
Grasslands	22.17	0.21
Settlements	103.26	0.99
Vegetation outside Forest	192.62	1.85
Water bodies	261.44	2.51
<b>Total</b>	<b>10408.00</b>	

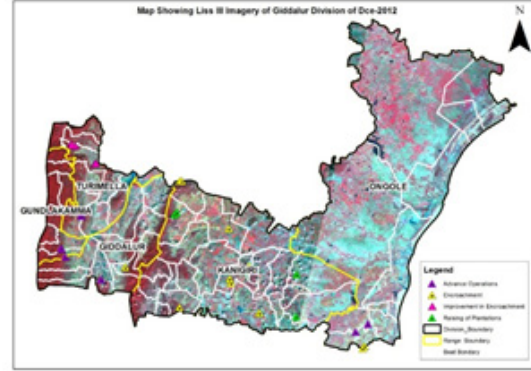


**Fig 4.5.1**

negative change (including scrub) is 312.59 Ha. Out of this 137.69 Ha is on account of clearance of jungle growth for raising of plantations, and 174.90 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 the negative change due to encroachments alone is taken as loss of forest cover. Therefore, the net loss of forest cover is 174.90 Ha in the Division.



**Fig 4.5.2**



**Fig 4.5.3**

There are 62 Beats in the Division. Negative changes are noticed in 13 Beats and Positive changes in 3 beats. There are no changes in the forest cover in the remaining 46 Beats. Details of Forest cover along with changes in 62 Beats are shown in Table 4.5.3.

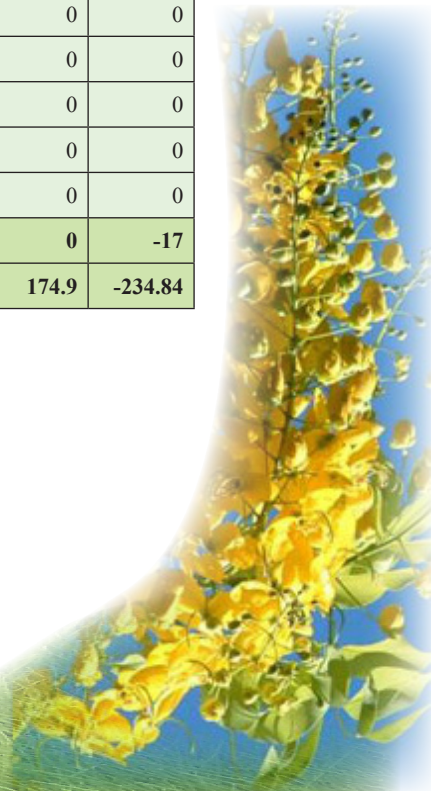
Table 4.5.2: Forest Cover change matrix (Area in Km <sup>2</sup> )							
2011	2012						Total of 2011
	VDF	MDF	OF	SF	NF	Water	
Very Dense Forest	24.64	0.00	0.00	0.00	0.00	0.00	24.64
Moderately Dense Forest	0.00	468.06	0.00	0.00	0.00	0.00	468.06
Open Forest	0.00	0.00	903.32	0.00	0.05	0.00	903.37
Scrub	0.00	0.00	0.00	778.85	3.08	0.00	781.93
Non-Forest	0.00	0.00	0.00	0.78	28.09	0.00	28.87
Water	0.00	0.00	0.00	0.00	0.00	1.34	1.34
<b>Total of 2012</b>	<b>24.64</b>	<b>468.06</b>	<b>903.32</b>	<b>779.63</b>	<b>31.22</b>	<b>1.34</b>	<b>2208.21</b>
<b>Net Change</b>	<b>0.00</b>	<b>0.00</b>	<b>-0.05</b>	<b>-2.30</b>	<b>2.35</b>	<b>0.00</b>	

Table 4.5.3: List of Beats showing Forest Cover with changes. (Area in Ha)									
BEAT	VDF	MDF	OF	SF	NF	WB	Total	Encroachment	Net change
<b>Giddalur Range</b>									
Allinagaram	189.281	1814.15	2091.453	579.358	9.674	0	4683.916	0	0
Bodi	29.661	1512.829	2196.69	2753.328	0	0	6492.508	0	0
Chinaobenipalli	0	112.046	2257.448	1649.315	43.593	0	4062.402	0	0
Chintalapalli	73.808	1096.295	2288.364	255.389	61.071	0	3774.927	4.98	-4.98



BEAT	VDF	MDF	OF	SF	NF	WB	Total	Ecroachment	Net change
Gunthapalli	0	38.172	1558.01	1351.159	24.31	0	2971.651	0	-24.31
Janapalacheruvu	8.209	630.462	3078.741	1133.647	166.609	0	5017.668	0	0
Nallaguntla	0	112.677	2160.216	1107.229	1.018	0	3381.14	0	0
Sanjeevarao peta	2.373	1056.997	2305.036	2654.515	0	3.52	6022.441	0	0
Singasanipalli	130.383	3215.608	1991.92	102.76	173.873	0	5614.544	0	0
Taticherla	0	52.428	972.754	1762.403	0	0	2787.585	0	0
Uyyalawada	38.106	1492.972	1450.665	957.856	0	13.273	3952.872	0	0
<b>Total</b>	<b>471.821</b>	<b>11134.636</b>	<b>22351.297</b>	<b>14306.959</b>	<b>480.148</b>	<b>16.793</b>	<b>48761.654</b>	<b>4.98</b>	<b>-29.29</b>
<b>Gundlakamma Range</b>									
Diguvametta	0.998	703.048	2932.756	1867.737	0	0	5504.539	0	0
Isukagundam	0.566	1441.404	2294.848	1177.536	0	0	4914.354	0	0
Kothakota	0	993.867	2180.078	1015.524	15.19	0	4204.659	0	-15.19
Malakondapenta east	0	139.553	2691.131	3489.627	0	0	6320.311	0	0
Malakondapenta west	5.068	3482.718	2558.584	314.969	0	0	6361.339	0	0
Obulesunipenta	0	1430.477	2958.265	438.897	0	0	4827.639	0	0
Sandrapodu	8.47	499.259	2541.707	2349.517	6.34	35.103	5440.396	0	-6.34
Tunnel	7.725	947.579	2200.452	964.445	0	0	4120.201	0	0
<b>Total</b>	<b>22.827</b>	<b>9637.905</b>	<b>20357.821</b>	<b>11618.252</b>	<b>21.53</b>	<b>35.103</b>	<b>41693.438</b>	<b>0</b>	<b>-21.53</b>
<b>Kanigiri Range</b>									
Ambavaram	99.005	895.067	424.961	2.809	0	0	1421.842	0	0
Ballipalli	4.802	518.826	1441.373	287.953	34.39	0	2287.344	34.39	-34.39
Bonthavaripalli	370.034	2051.923	2351.95	128.081	0	0	4901.988	0	0
Chennapanauunipalli	828.958	3954.963	649.159	7.35	0	0	5440.43	0	0
Chundi north	5.941	1350.69	974.083	60.194	0	0	2390.908	0	0
Chundi south	3.096	529.956	1660.417	405.482	7.395	0	2606.346	0	27.98
Gudipatipalli	7.901	901.397	4340.661	2102.046	8.289	0	7360.294	0	35.93
Gunthachenampalli	27.177	1201.675	1788.117	102.707	4.68	0	3124.356	4.68	-4.68
Hazeepuram	0	11.371	569.137	827.231	18.59	0	1426.329	18.59	-18.59
Kanigiri	1.459	196.348	1357.322	470.987	0	7.532	2033.648	0	0
Kodigampalli	1.482	169.707	1974.587	1327.616	15.1	22.164	3510.656	15.1	-15.1
Malapadu	73.796	689.637	795.967	212.373	3.501	2.45	1777.724	0	13.84
Malapadu l	39.55	1404.917	1393.951	32.101	0	0	2870.519	0	0
Mogilicherla	0	22.451	475.867	220.818	0	3.353	722.489	0	0
Nagireddipalli p	0	178.46	1422.37	997.061	0	0	2597.891	0	0
Peddacherlopalli	27.975	1035.352	1123.79	68.098	0	0	2255.215	0	0
Peddirlapadu	50.649	1265.339	1623.838	250.257	0	0	3190.083	0	0
Tadivaripalli	1.323	135.186	3164.228	2819.456	21.105	0	6141.298	17.64	-17.64

BEAT	VDF	MDF	OF	SF	NF	WB	Total	Ecroachment	Net change
Thummagunta	0	339.269	1715.329	281.27	0	0	2335.868	0	0
Thungodu	358.594	3184.577	1650.533	37.885	0	0	5231.589	0	0
Vedullacheruvup	48.916	2888.027	2621.785	130.513	0	0	5689.241	0	0
<b>Total</b>	<b>1950.66</b>	<b>22925.138</b>	<b>33519.425</b>	<b>10772.288</b>	<b>113.05</b>	<b>35.499</b>	<b>69316.058</b>	<b>90.4</b>	<b>-12.65</b>
<b>Ongole Range</b>									
Chagollu	0	0	34.88	421.485	39.885	7.322	503.572	0	0
Chakicherla	0	0	23.867	228.122	284.05	0	536.039	0	0
Chimakurthy	0	173.991	1731.475	1225.655	0.341	0	3131.462	0	0
Gudlur	0.557	18.379	619.006	980.322	408.257	0	2026.521	0	-74.85
Kukatlapalli	1.99	133.192	939.473	330.383	0	0	1405.038	0	0
Kullurpadu	0	0.63	55.468	218.435	244.273	0	518.806	0	0
Mocherla	0	161.852	745.397	2228.985	519.759	4.492	3660.485	6.77	-6.77
Motupalli	0	0.626	41.017	175.337	226.513	0	443.493	0	0
Peddavaram	0	8.573	202.05	215.312	3.738	10.335	440.008	0	0
Perlavanlapalle	0	0	4.07	112.964	26.885	0	143.919	0	0
Potlur	0.073	23.329	718.779	1840.096	652.299	9.808	3244.384	72.75	-72.75
Pullaripalem	0	0	12.053	120.022	78.171	0	210.246	0	0
<b>Total</b>	<b>2.62</b>	<b>520.572</b>	<b>5127.535</b>	<b>8097.118</b>	<b>2484.17</b>	<b>31.957</b>	<b>16263.973</b>	<b>79.52</b>	<b>-154.37</b>
<b>Turimella Range</b>									
Ambavaram	2.402	124.175	452.835	4265.918	17	7.685	4870.015	0	-17
Araveetikota	2.707	191.01	1285.809	5145.956	0.824	3.787	6630.093	0	0
Bollupalli	0.758	399.569	1699.055	3487.361	0	0	5586.743	0	0
J.b. Krishnapuram	0	8.911	299.995	3658.809	0	0	3967.715	0	0
J.p.cheruvu	0	75.996	248.337	3224.97	0	0	3549.303	0	0
Maddipenta	0.627	841.431	1801.57	1343.406	0	0	3987.034	0	0
Papinenipalli	10.029	866.371	1577.362	3031.791	0.82	2.645	5489.018	0	0
Racherla	0	0	57.899	3672.209	1.079	0	3731.187	0	0
Turimella	0	41.635	630.008	2343.328	0.435	0.894	3016.3	0	0
Velagalapaya	0	38.446	922.994	2994.007	2.832	0	3958.279	0	0
<b>Total</b>	<b>16.523</b>	<b>2587.544</b>	<b>8975.864</b>	<b>33167.755</b>	<b>22.99</b>	<b>15.011</b>	<b>44785.687</b>	<b>0</b>	<b>-17</b>
<b>Grand Total</b>	<b>2464.45</b>	<b>46805.795</b>	<b>90331.942</b>	<b>77962.372</b>	<b>3121.89</b>	<b>134.36</b>	<b>220820.81</b>	<b>174.9</b>	<b>-234.84</b>





## 4.6 GUNTUR DIVISION

### 4.6.1 Introduction:

Guntur Forest Division comprises of the entire District and lies in the south-eastern part of Prakasham District between latitudes 15° 42' 13.68" and 16° 49' 23.52" N and longitudes 79° 12' 34.56" and 80° 54' 16.92" E. Geographical area of the Division is 10623.19 Km<sup>2</sup>. The Division has four physiographic zones- the sea board, the plains, ghats and hills rising gently to an altitude of 500 M and the 'U' shaped Nallamalai hills skirting Macherla to its west and Markapur and Kurnool Divisions to the east. The other hill ranges of the Division are Venkatayyapalem and Kondaveedu of Sattenapalli and Narasaraopet. The important rivers draining into the Division are the Krishna and the Gundlakamma with tributaries Chandravanka, Goli and Naguleru in Macherla.

Land use pattern of the Division is given in Table 4.6.1

The climate of this Division is dry and salubrious; temperature ranges from 17°C to 40°C and the annual rainfall is about 989 mm received both from the South-West and North-East monsoons. The Common rocks are Shales, Slates, Lime-stone, Quartzite, Gneisses and Schist. Soils of all kinds occur in the Division, Swampy in the Krishna estuary, Sandy along the coast, Alluvial on the banks of Krishna, Red Gravelly in the interior and Loamy of rather rare occurrence.

Population of Guntur Division is 4.88 million (2011 Census); the per capita forest area is 0.04 Ha and the population density is 429 persons per Km<sup>2</sup>. The livestock population is 2.3 million.

**Table 4.6.1: Land use Pattern**

Land use	Area in Km <sup>2</sup>	Percentage
Forest including Scrub	1112.92	10.48
Agriculture	8446.28	79.51
Land with Scrub	80.08	0.75
Fallow Lands	314.65	2.96
Grasslands	0.71	0.01
Settlements	287.41	2.71
Vegetation outside Forest	107.88	1.02
Water Bodies	273.26	2.57
<b>Total</b>	<b>10623.19</b>	

### 4.6.2 Recorded Forest Area:

The notified forest area of the Division is **1411.10 Km<sup>2</sup>**, which is 13.28 % of the geographical area. The entire forest area is Reserved Forest.

As per Champion and Seth's classification, the major Forest types of Division are Coastal Forests and Inland Forests. In Coastal Forests, Mangroves and Dry evergreen Forests are present. Whereas, Inland Forests contains Southern Dry Mixed Deciduous, *Hardwickia binata* and *Acacia arabica* forests.

### 4.6.3 Protected Area:

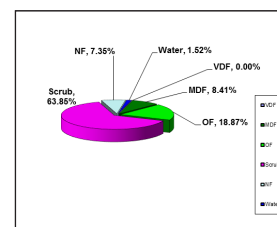
The Division contains a part of the Krishna Wildlife Sanctuary (KWS). An area of 81.99 Km<sup>2</sup> of the Division is included in the Krishna Wildlife Sanctuary (KWS).

### 4.6.4 Community Forest Management:

There are 180 Vana Samrakshana Samities (VSSs) in the Division. An area of 260.80 Km<sup>2</sup> forests, which constitutes 16.10 % of the notified forests, is under the management of the VSSs.

### 4.6.5 Forest Cover:

The forest cover in the Division based on the interpretation of IRS R2 LISS III 2012 data (Nov 2012) is **402.95 Km<sup>2</sup>** which is **3.79%** of the Geographical area. In terms of the forest canopy cover density classes, the Division has **124.24 Km<sup>2</sup>** of Moderately Dense Forests and **278.71 Km<sup>2</sup>** of Open Forests. The area of the Scrub is **942.96 Km<sup>2</sup>**, Non-Forest **108.50 Km<sup>2</sup>** and Water Bodies **22.50 Km<sup>2</sup>**. The distribution of the forest cover of the Division is shown in Fig 4.6.1.



**Fig 4.6.1**

#### 4.6.6 Change in Forest Cover:

The satellite images of 2011 and 2012 are shown in Figs 4.6.2 & 4.6.3 respectively. The changes between this period are shown on the image of 2012.

Comparison of the current forest cover with that of previous assessment year shows a negative change of **10.84 Ha**. The forest cover change matrix given in Table 4.6.2 reveals that there is a decrease of **10.84 Ha** of open forest and **185.11 Ha** of scrub with a total increase of **195.95 Ha** of Non Forest.

Out of the total negative change of **195.95 Ha**, **174.86 Ha** is on account of clearance of jungle growth for raising of plantations and **13.11 Ha** on account of encroachments and **7.98 Ha** is on account of Fire. As clearance of jungle growth for raising of plantations is forest management intervention, the same is not considered as loss of forest cover. Loss of forest cover due to fire is also not considered as loss of forest cover as it is temporary loss only. Thus the negative change due to encroachments alone is taken as loss of forest cover. Therefore, **the net loss of forest cover is 10.84 Ha** only.

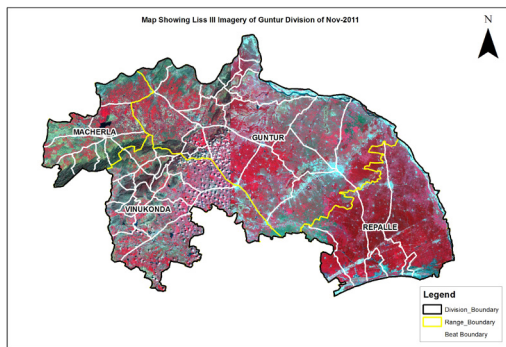


Fig 4.6.2

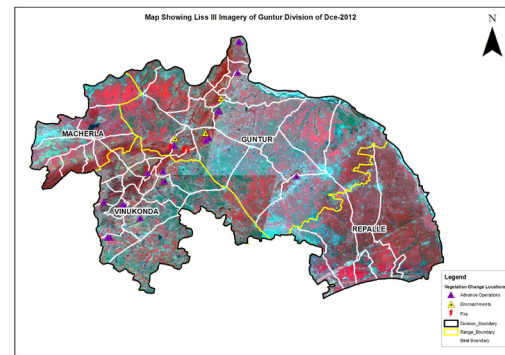


Fig 4.6.3

There are 57 Beats in the Division. Negative changes in forest cover are noticed in 16 Beats. There are no changes in the remaining 41 Beats.

Details of the forest cover along with changes in the Beats, are shown in Table 4.6.3.

Table 4.6.2: Forest Cover change matrix							(Area in Km <sup>2</sup> )
2011	2012						Total of 2011
	VDF	MDF	OF	SF	NF	Water	
Very Dense Forest	0.00	0.00	0.00	0.00	0.00	0.00	<b>0.00</b>
Moderately Dense Forest	0.00	124.24	0.00	0.00	0.00	0.00	<b>124.24</b>
Open Forest	0.00	0.00	278.71	0.00	0.11	0.00	<b>278.82</b>
Scrub	0.00	0.00	0.00	942.96	1.85	0.00	<b>944.81</b>
Non-Forest	0.00	0.00	0.00	0.00	106.54	0.00	<b>106.54</b>
Water	0.00	0.00	0.00	0.00	0.00	22.50	<b>22.50</b>
<b>Total of 2012</b>	<b>0.00</b>	<b>124.24</b>	<b>278.71</b>	<b>942.96</b>	<b>108.50</b>	<b>22.50</b>	<b>1476.91</b>
<b>Net Change</b>	<b>0.00</b>	<b>0.00</b>	<b>-0.11</b>	<b>-1.85</b>	<b>1.96</b>	<b>0.00</b>	

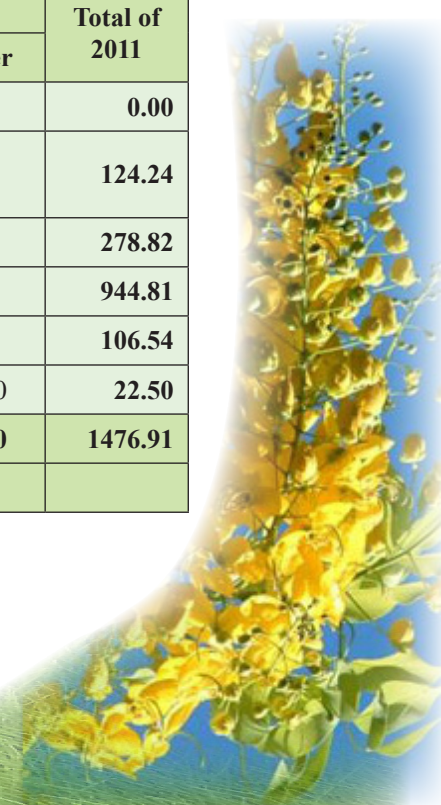
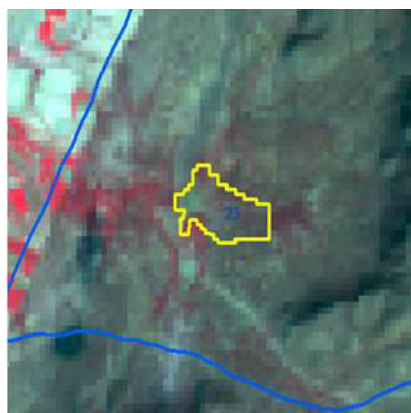




Table 4.6.3: List of Beats showing Forest Cover with Changes.								(Area in Ha)	
BEAT	MDF	OF	SF	NF	WB	Total	Encroachment	Net Change	
<b>Guntur Range</b>									
Ameenabad	0.00	21.17	773.49	450.12	2.23	1247.01	0.00	0.00	
Atchampet	494.04	947.84	1387.61	24.41	0.00	2853.90	0.00	-4.24	
Bodanam	198.94	384.99	1084.65	24.95	0.00	1693.53	0.00	0.00	
Chinthapalli	617.43	1260.79	827.35	244.43	0.00	2949.99	0.00	0.00	
Dodleru	186.01	391.57	31.51	41.61	0.00	650.70	0.00	-10.20	
Enamdala	0.00	891.84	1552.16	640.99	0.52	3085.51	0.00	-20.96	
Endroy	0.00	1.45	501.46	297.55	0.00	800.47	0.00	0.00	
Gundlapalli	505.51	1048.91	1376.30	61.21	0.00	2991.92	2.20	-7.51	
Guthikonda	822.24	1702.57	1381.00	40.09	0.00	3945.90	0.00	-10.43	
Konanki	587.92	1322.13	859.26	131.68	0.00	2900.99	0.00	0.00	
Kondaveedu	2.72	453.75	623.82	138.73	0.00	1219.01	0.00	0.00	
Madinapadu	10.05	30.26	4191.48	431.74	0.00	4663.53	0.00	0.00	
Mangalagiri	0.00	86.99	487.14	86.57	0.00	660.70	0.00	0.00	
Nekarikal	259.47	488.44	1740.82	149.13	0.00	2637.86	0.00	-1.59	
Papayapalem	596.65	1318.15	976.66	31.31	0.00	2922.76	9.56	-9.56	
Pulichintha	604.98	864.60	2200.22	47.80	0.00	3717.59	0.00	0.00	
Tripurapuram	740.60	1720.82	1317.40	181.33	0.00	3960.14	1.35	-15.56	
Tsallagariga	199.88	424.93	4525.26	87.28	0.00	5237.36	0.00	-38.77	
Vemavaram	3.83	13.04	3016.99	140.06	0.00	3173.93	0.00	0.00	
Venkatayapalem	297.02	730.44	1617.68	6.39	0.00	2651.53	0.00	0.00	
<b>Total</b>	<b>6127.28</b>	<b>14104.67</b>	<b>30472.26</b>	<b>3257.36</b>	<b>2.75</b>	<b>53964.31</b>	<b>13.11</b>	<b>-118.82</b>	
<b>Macherla Range</b>									
Adigoppula	258.86	659.00	2199.56	18.79	0.00	3136.21	0.00	0.00	
Daida	1.03	3.07	1458.91	184.41	0.00	1647.41	0.00	0.00	
Kakirala	18.07	24.54	2111.05	4.63	0.00	2158.30	0.00	0.00	
Loyapalli	218.48	301.41	4301.73	45.38	0.00	4867.00	0.00	0.00	
Macherla	0.51	6.60	5046.16	460.84	0.00	5514.11	0.00	0.00	
Madugula	5.02	12.86	515.45	117.39	0.00	650.73	0.00	0.00	
Minchalapadu	228.35	243.66	3304.99	43.61	0.00	3820.61	0.00	0.00	
Mutukuru	357.58	664.97	3638.43	29.43	0.00	4690.41	0.00	0.00	
Veldurthi	8.96	27.14	2749.13	364.92	0.00	3150.15	0.00	0.00	
<b>Total</b>	<b>1096.85</b>	<b>1943.26</b>	<b>25325.41</b>	<b>1269.40</b>	<b>0.00</b>	<b>29634.92</b>	<b>0.00</b>	<b>0.00</b>	
<b>Repalle Range</b>									
Adavuladeevi	0.00	0.00	339.58	383.80	225.53	948.91	0.00	0.00	
Dindi	0.00	18.68	200.44	252.50	19.74	491.36	0.00	0.00	
Muthayapalem A	0.00	56.16	307.54	460.63	17.13	841.46	0.00	0.00	
Muthayapalem B	0.00	14.06	997.90	977.74	155.01	2144.71	0.00	0.00	
Nizampatnam	5.93	262.90	344.63	221.35	40.71	875.53	0.00	0.00	
Puluguvaripalem	0.00	340.92	564.09	498.48	40.96	1444.44	0.00	0.00	
<b>Total</b>	<b>5.93</b>	<b>692.71</b>	<b>2754.18</b>	<b>2794.51</b>	<b>499.09</b>	<b>6746.41</b>	<b>0.00</b>	<b>0.00</b>	
<b>Vinukonda Range</b>									
Bollapalli	686.17	1191.11	2051.71	18.53	0.00	3947.52	0.00	0.00	
Chejerla	763.56	1135.63	757.50	30.98	0.00	2687.68	0.00	-11.05	
Domalagudem	21.97	62.67	2843.29	15.73	0.00	2943.66	0.00	0.00	
Epuru East	59.97	64.48	1649.13	55.44	0.00	1829.02	0.00	-4.68	
Epuru West	587.75	953.44	1176.91	59.24	0.00	2777.33	0.00	0.00	
Garikapadu	256.52	646.24	1200.29	9.95	0.00	2113.00	0.00	0.00	
Jayanthipuram	479.63	893.60	722.67	30.81	0.00	2126.70	0.00	-10.22	
Kandrika	268.93	416.45	3436.93	29.71	0.00	4152.02	0.00	-12.29	
Kanumulachervu	132.23	328.66	4925.22	211.57	46.52	5644.19	0.00	0.00	

Table 4.6.3: List of Beats showing Forest Cover with Changes.							(Area in Ha)	
BEAT	MDF	OF	SF	NF	WB	Total	Encroachment	Net Change
Karempudi	308.81	704.00	1903.98	4.59	0.00	2921.37	0.00	0.00
Mellavagu	166.39	472.34	1474.67	3.69	0.00	2117.08	0.00	0.00
Naidupalem	185.11	449.57	2604.74	46.83	15.08	3301.32	0.00	-15.08
Ravulapuram	402.96	962.83	1490.97	29.10	0.00	2885.86	0.00	0.00
Ravvaram	20.49	62.69	1270.25	266.67	4.75	1624.85	0.00	0.00
Remidicherla	796.29	1759.45	846.44	37.15	0.00	3439.33	0.00	0.00
Tangedumalli	34.33	91.78	468.52	13.55	0.00	608.18	0.00	0.00
Tangirala	17.28	22.97	1288.55	52.17	0.00	1380.96	0.00	-13.60
Vaddemgunta	5.64	8.54	2644.91	55.53	0.00	2714.61	0.00	-10.21
<b>Total</b>	<b>5194.01</b>	<b>10226.43</b>	<b>32756.65</b>	<b>971.24</b>	<b>66.35</b>	<b>49214.68</b>	<b>0.00</b>	<b>-77.13</b>
<b>WL-Krishna Range</b>								
Kothapalem(WI)	0.00	268.12	569.68	281.99	14.54	1134.33	0.00	0.00
Lanka Vanidibba(WI)	0.00	279.24	878.88	911.51	1396.46	3466.09	0.00	0.00
Mollagunta(WI)	0.00	357.17	1553.93	1334.22	286.31	3531.64	0.00	0.00
<b>Total</b>	<b>0.00</b>	<b>904.53</b>	<b>3002.49</b>	<b>2527.72</b>	<b>1697.31</b>	<b>8132.06</b>	<b>0.00</b>	<b>0.00</b>
<b>Grand Total</b>	<b>12424.06</b>	<b>27871.61</b>	<b>94310.99</b>	<b>10820.23</b>	<b>2265.48</b>	<b>147692.37</b>	<b>13.11</b>	<b>-195.95</b>

2011



2012



Longitude	79.57691 ° E
Latitude	16.17889 ° N
Area in Ha	12.29
Change	Negative
Comp No.	32
Beat	Kandrika
Range	Vinukonda
Division	Guntur





## 4.7 NELLORE DIVISION

### 4.7.1 Introduction:

Nellore Forest Division comprises of the entire District of Nellore and lies in the south-eastern part of Andhra Pradesh between latitudes 13° 48' 49.58" and 15° 4' 58.59" N and longitudes 79° 6' 4.36" and 80° 14' 46.71" E. Geographical area of the Division is 12934.72 Km<sup>2</sup>.

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

The Division is bordered by the Bay of Bengal on the east, state of Tamil Nadu on the south, the district of Kadapa on the west and the district of Prakasham on the north. The eastern side consists of area of low lying land extending from the base of the Eastern Ghats to the sea. The western side of the district is separated from Kadapa district by Veligonda hills. The district is split by the River Pennar and is located on both south and north banks of it. This Division has 4 physiographic zones - the sea board, the plains, the foothills and the Ghats reaching up to 800 M above MSL. The principal rivers in the district are Pennar in the centre, Kandaleru, Swarnamukhi and Kalinga in the south and Uppuvagu in the north.

**Table 4.7.1: Land use Pattern**

Land use	Area in km <sup>2</sup>	Percentage
Forest including Scrub	1879.83	14.53
Agriculture	6610.72	51.11
Land with Scrub	2126.77	16.44
Fallow Lands	621.88	4.81
Grasslands	21.02	0.16
Settlements	84.33	0.65
Vegetation outside Forest	141.98	1.10
Water Bodies	1448.19	11.20
<b>Total</b>	<b>12934.72</b>	

The climate of this Division is hot and exhausting for most part of the year. Temperature ranges from 15° to 41° C. Annual rainfall ranges from 700-1040 mm, received from both south-west and north-east monsoons.

The Division is under laid by two types of the oldest rocks, Schistose and Quartzites of the Dharwar System. The Peninsular gneisses, Closepet granite and Pegmatite are also found intruding into the schistose series, the north-west portion of the Dharwarian belt of Nellore is devoid of Pegmatite intrusions but the South Eastern portion, Gudur, Rapur areas are traversed by many intrusions and they contain Deposits of Muscovite mica. The soil types found mainly are Sandy, Red, Lateritic, Murram, Clayey and Alluvial soils.

Population of the Division is 2.96 million (2011 Census), per capita forest area is 0.08 Ha and the population density is 226 persons per Km<sup>2</sup>. The livestock population is 2.5 million.

### 4.7.2 Recorded Forest Area:

The notified forest area of the Division is **2519.37 Km<sup>2</sup>** which is 19.26% of the geographical area. Reserved, Protected and un-classed forests constitute 2,500.01 Km<sup>2</sup> (99.23%), 14.46 Km<sup>2</sup> (0.57%) and 4.90 Km<sup>2</sup> (0.19%) of the forest area respectively.

As per Champion and Seth's classification, this Division has 5 major forest types - Dry Red Sanders bearing forest, Southern Tropical Dry Mixed Deciduous forests, *Hardwickia binata* forest, Southern Tropical Thorn Forest and Southern Topical Dry evergreen forest.

### 4.7.3 Protected Area:

The Nellore Division is en-compassing 3 Wild Life Sanctuaries namely the Penusila Narasimha Swami (PNS) WLS with an area of 1030 Km<sup>2</sup>, Pulicat Bird Sanctuary (PBS)- a RAMSAR wetland, with an area of 500 Km<sup>2</sup> and Nelapattu Bird Sanctuary (NBS) with an extent of 4.58 Km<sup>2</sup>.

### 4.7.4 Community Forest Management:

There are 292 Vana Samrakshana Samities (VSSs) in the Division. An area of 645.93 Km<sup>2</sup> of forests which is 25.63 % of the notified forests, is under the management of the VSSs.



#### 4.7.5 Forest Cover:

The forest cover in the Division based on the interpretation of IRS R2 LISS III 2012 data (Nov/Dec- 2012) is **1002.12 Km<sup>2</sup>**, which is **7.75%** of the geographical area. In terms of the forest cover canopy density classes, the Division has **50.80 Km<sup>2</sup>** of very Dense Forest, **486.64 Km<sup>2</sup>** of Moderately Dense Forests and **464.68 Km<sup>2</sup>** of Open Forests. The area of the Scrub is **1073.78 Km<sup>2</sup>**, Non-Forest **273.15 Km<sup>2</sup>** and Water Bodies **30.91 Km<sup>2</sup>**. The distribution of the forest cover of the Division is shown in Fig 4.7.1

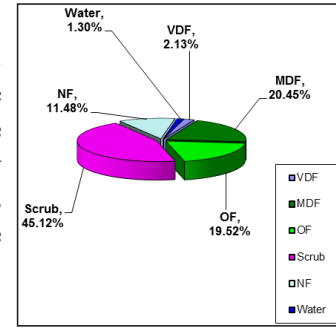


Fig 4.7.1

#### 4.7.6 Change in Forest Cover:

The Satellite images of 2011 and 2012 are shown in Figs 4.7.2 & 4.7.3 respectively and the changes between this period, on the image of 2012.

Comparison of the current forest cover with that of previous assessment year shows a **negative change of 36.48 Ha**. The forest cover change matrix given in Table 4.7.2 reveals that there is a decrease of **36.48 Ha** of Open forest. And there is a net change of **269.8 Ha** of Scrub forest.

The total **positive** change (including scrub) is **538.57 Ha**. Out of this, **528.39 Ha** is on account of growth in raised plantations and **10.18 Ha** is on account of improvement of forest due to protection and management interventions. The total **negative** change (including scrub) is **844.85Ha**, in which, **17.40 Ha** is on account of encroachments, **13.16 Ha** is an account of failure plantations, **194.90 Ha** is on account of Harvesting plantation and **619.39 Ha** is on account of clearance of jungle growth for raising of plantations. As clearance of jungle growth for raising of plantations and harvesting of matured plantations are forest management interventions, the same are not considered as loss of forest cover. Thus the negative change due to encroachments alone is taken as loss of forest cover. Therefore, the net loss of forest cover is **17.40 Ha** in the Division.

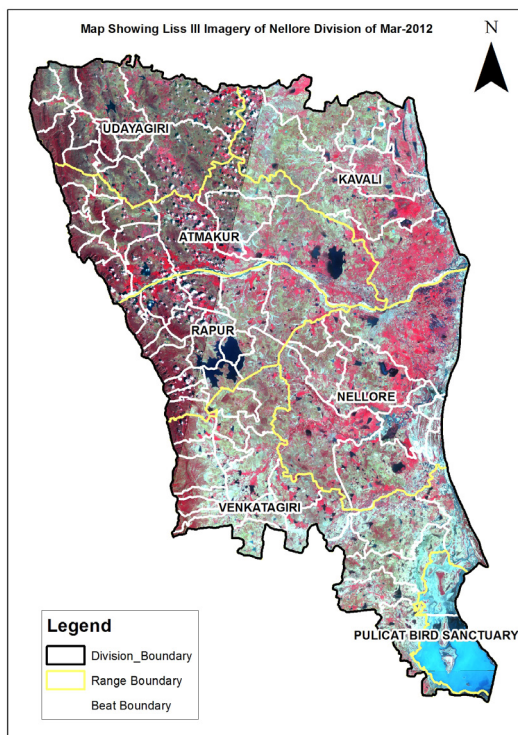


Fig 4.7.2

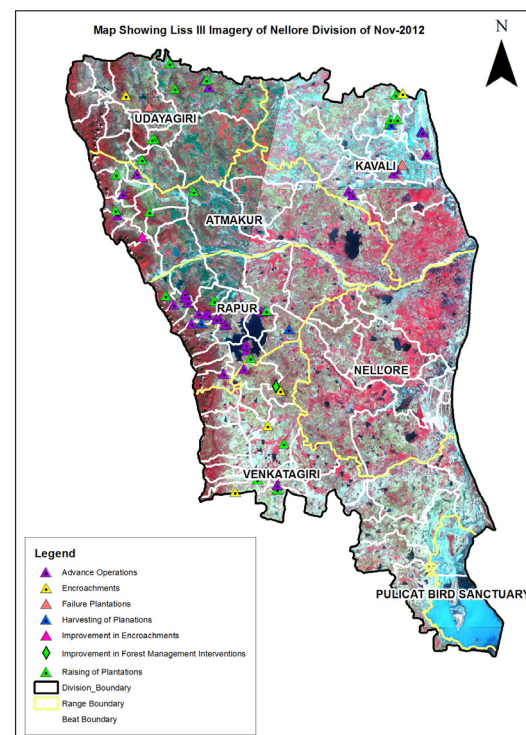


Fig 4.7.3





There are 85 Beats in the Division. Negative changes in forest cover are noticed in 18 Beats and positive changes in the forest cover are noticed in 13 beats. There are no changes in the remaining 54 Beats. And there are 2 Beats in Pulicat Bird Sanctuary Range which comes under Wild Life Management Division, Sullurpet.

Details of forest cover along with changes in 85 Beats are shown in Table 4.7.3.

Table 4.7.2: Forest Cover change matrix							(Area in Km <sup>2</sup> )
2011	2012						Total of 2011
	VDF	MDF	OF	SF	NF	Water	
Very Dense Forest	50.80	0.00	0.00	0.00	0.00	0.00	<b>50.80</b>
Moderately Dense Forest	0.00	486.64	0.00	0.00	0.00	0.00	<b>486.64</b>
Open Forest	0.00	0.00	464.68	0.00	0.36	0.00	<b>465.04</b>
Scrub	0.00	0.00	0.00	1068.39	8.08	0.00	<b>1076.47</b>
Non-Forest	0.00	0.00	0.00	5.39	264.71	0.00	<b>270.10</b>
Water	0.00	0.00	0.00	0.00	0.00	30.91	<b>30.91</b>
<b>Total of 2012</b>	<b>50.80</b>	<b>486.64</b>	<b>464.68</b>	<b>1073.78</b>	<b>273.15</b>	<b>30.91</b>	<b>2379.96</b>
<b>Net Change</b>	<b>0.00</b>	<b>0.00</b>	<b>-0.36</b>	<b>-2.69</b>	<b>3.05</b>	<b>0.00</b>	

Table 4.7.3 List of Beats showing Forest Cover with Changes.									(Area in Ha)
BEAT	VDF	MDF	OF	SF	NF	WB	Total	Encroachment	Net Change
<b>Atmakur Range</b>									
Bata	7.67	923.89	977.73	1951.08	35.02	3.22	3898.62	0.00	5.57
Bommavaram	0.00	564.39	360.61	126.63	0.00	0.00	1051.62	0.00	0.00
Brahmanapalli	68.89	1219.74	479.30	408.88	20.38	5.17	2202.36	0.00	-3.25
Gowravaram	24.93	1072.35	951.23	1352.79	8.65	2.79	3412.73	0.00	0.00
Gudigunta	257.98	2846.42	1325.60	1342.97	84.26	3.13	5860.36	0.00	0.00
Gudipadu	0.00	0.00	26.63	1122.72	756.01	193.40	2098.75	0.00	0.00
K.n. Palli N	23.20	1448.24	871.53	295.49	1.05	0.00	2639.51	0.00	0.00
Kampasamudram	0.00	0.00	0.00	610.26	153.26	7.61	771.13	0.00	-10.40
Ponguru	3.65	289.09	1442.45	2384.77	59.72	0.00	4179.68	0.00	23.50
Rajavolu	0.00	66.84	201.27	1554.72	73.52	0.00	1896.34	0.00	0.00
Rajupalem	34.57	1433.23	549.74	414.32	24.62	0.00	2456.47	0.00	5.66
Sangam	26.79	194.69	648.61	1327.50	860.29	0.00	3057.87	0.00	0.00
Singanapalli	3.35	800.19	1057.34	1043.34	92.80	0.00	2997.01	0.00	4.85
T. Talupur	71.34	1950.25	833.86	617.19	26.85	0.00	3499.49	0.00	0.00
Venkatapuram	0.00	0.00	1179.06	2588.27	76.11	0.00	3843.44	0.00	0.00
<b>Total</b>	<b>522.37</b>	<b>12809.31</b>	<b>10904.94</b>	<b>17140.91</b>	<b>2272.52</b>	<b>215.32</b>	<b>43865.35</b>	<b>0.00</b>	<b>25.93</b>

Table 4.7.3 List of Beats showing Forest Cover with Changes.								(Area in Ha)	
BEAT	VDF	MDF	OF	SF	NF	WB	Total	Encroachment	Net Change
<b>Kavali Range</b>									
Bitragunta	0.00	0.00	75.16	509.33	345.64	0.00	930.13	0.00	-49.22
Chinnannaluru	0.00	0.00	1.70	1128.60	696.15	224.43	2050.87	0.00	0.00
Dagadarthi	4.68	60.49	901.84	1550.06	646.64	0.00	3163.70	0.00	-109.92
Gollapalem	0.00	48.77	643.23	357.02	683.44	0.00	1732.46	0.00	-25.10
Kavali	0.00	0.00	198.34	1050.97	1368.72	8.00	2626.03	0.00	164.28
Kesawaram	0.00	0.73	0.00	886.65	468.30	191.22	1546.90	0.00	0.00
Kothapalli	11.51	50.31	185.87	1451.76	475.80	19.48	2194.72	0.00	0.00
Racherlapadu	0.00	7.09	325.47	376.14	592.69	0.00	1301.40	0.00	0.00
<b>Total</b>	<b>16.19</b>	<b>167.38</b>	<b>2331.60</b>	<b>7310.54</b>	<b>5277.38</b>	<b>443.13</b>	<b>15546.21</b>	<b>0.00</b>	<b>-19.96</b>
<b>Nellore Range</b>									
Dontali	0.00	0.87	392.66	641.65	248.06	0.00	1283.24	0.00	0.00
Gudur	12.97	284.14	1074.61	1209.91	358.63	0.00	2940.27	0.00	0.00
I Puru	0.00	0.00	107.51	54.64	53.92	0.00	216.08	0.00	0.00
Kadivedu	0.00	2.18	828.64	630.24	445.48	0.00	1906.54	0.00	0.00
Kondlapudi	0.00	0.00	347.05	742.83	612.42	3.24	1705.54	0.00	0.00
Kothapatnam	0.00	0.69	99.13	299.07	393.17	3.96	796.01	0.00	0.00
Marupur	1.70	153.87	980.29	1140.13	203.21	0.00	2479.19	0.00	0.00
Tammenapatnam	0.00	0.00	81.41	133.94	196.30	0.00	411.66	0.00	0.00
Teegapalem	0.00	0.00	94.41	131.99	180.48	0.00	406.88	0.00	0.00
Vadlapudi	0.00	77.95	819.36	2079.01	994.87	0.00	3971.20	0.00	0.00
Varagali	0.00	0.00	120.50	234.77	290.38	0.00	645.65	0.00	0.00
Venkatachalam	0.00	17.56	974.63	1288.84	810.32	3.64	3094.99	0.00	0.00
<b>Total</b>	<b>14.67</b>	<b>537.26</b>	<b>5920.21</b>	<b>8587.03</b>	<b>4787.24</b>	<b>10.83</b>	<b>19857.23</b>	<b>0.00</b>	<b>0.00</b>
<b>Pulicat Bird Sanctuary Range</b>									
Pernadu	0.00	3.37	690.62	162.30	299.03	0.00	1155.32	0.00	0.00
Venadu	0.00	0.00	92.80	60.84	256.54	0.00	410.17	0.00	0.00
<b>Total</b>	<b>0.00</b>	<b>3.37</b>	<b>783.42</b>	<b>223.14</b>	<b>555.57</b>	<b>0.00</b>	<b>1565.49</b>	<b>0.00</b>	<b>0.00</b>
<b>Rapur Range</b>									
Adurpalli	0.00	42.68	254.09	1098.60	60.36	0.00	1455.73	0.00	0.00
Ammavaripalem	9.32	191.73	406.11	1364.57	60.63	0.00	2032.36	0.00	0.00
Chipini	213.36	1722.76	635.89	377.59	53.98	0.00	3003.58	0.00	11.75
Epuru	180.12	1417.70	379.45	516.14	23.77	0.00	2517.19	0.00	-22.07
Gonupalli	222.24	4574.85	1356.86	931.80	134.74	0.00	7220.48	0.00	-54.21
Kaluvoya	136.24	1263.90	690.56	932.30	169.56	2.87	3195.44	0.00	-29.10
Koturupalli	68.32	1572.74	641.06	413.81	113.68	0.00	2809.61	0.00	-101.70
Penubarthi	16.83	609.17	954.68	942.26	146.86	582.30	3252.10	0.00	-38.30
Pulikollu	0.00	34.62	141.15	476.44	144.86	560.13	1357.19	0.00	6.33
Rajupalem	28.04	1703.89	824.55	906.78	73.98	0.00	3537.24	0.00	38.24
Rapur	349.51	2625.48	663.05	331.24	5.33	0.00	3974.62	0.00	0.00
Tagecherla	13.73	1359.20	554.32	437.00	32.29	0.00	2396.55	0.00	-19.50
Thumaya	0.00	178.29	678.06	851.76	169.05	734.46	2611.62	0.00	-36.14
Turpukambampadu	0.52	43.73	354.52	1208.40	53.57	0.00	1660.74	0.00	0.00
Valasa	215.48	1861.98	522.80	962.49	1.24	0.00	3563.99	0.00	0.00

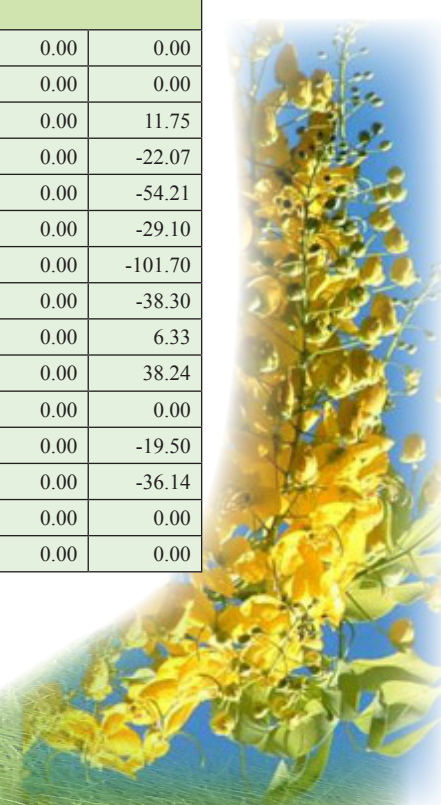
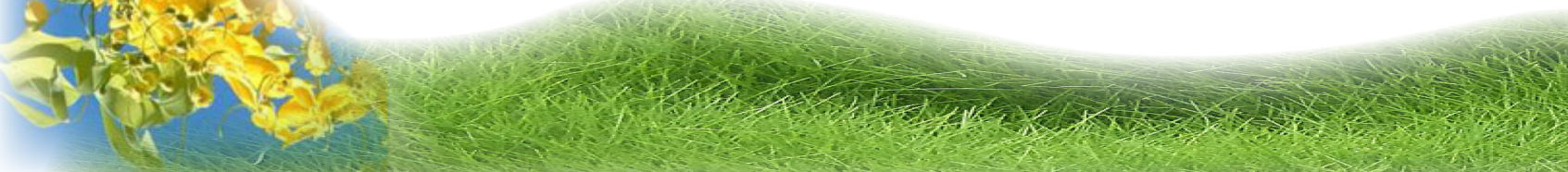
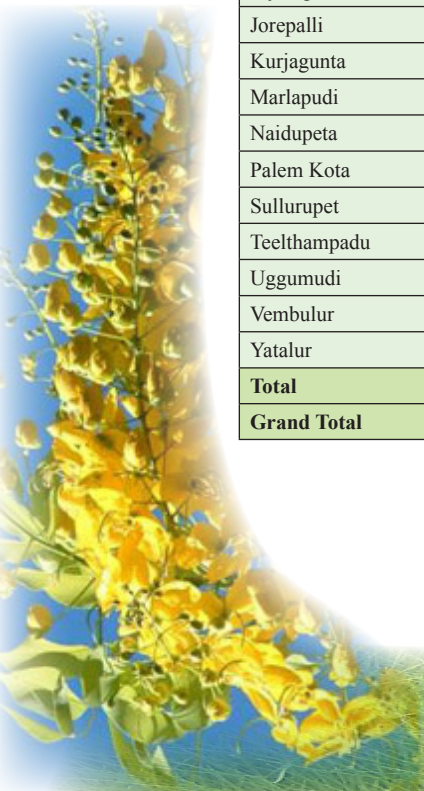




Table 4.7.3 List of Beats showing Forest Cover with Changes.								(Area in Ha)	
BEAT	VDF	MDF	OF	SF	NF	WB	Total	Encroachment	Net Change
Vavintaparathi	1.27	343.80	642.86	925.91	312.71	127.58	2354.14	0.00	-100.42
<b>Total</b>	<b>1454.99</b>	<b>19546.53</b>	<b>9699.99</b>	<b>12677.10</b>	<b>1556.62</b>	<b>2007.34</b>	<b>46942.56</b>	<b>0.00</b>	<b>-345.12</b>
<b>Udayagiri Range</b>									
Arlapadia	0.00	2.31	945.27	7052.29	155.94	64.67	8220.47	5.16	-10.73
Chinnanagampalle	0.00	0.00	100.60	1769.63	51.30	0.00	1921.52	0.00	0.00
Devammacheruvu	0.00	0.00	2369.75	5491.14	6.38	0.00	7867.26	0.00	0.00
Duttalur	0.00	0.00	6.09	3162.78	587.15	132.54	3888.55	0.00	0.00
Kottapalli	0.00	0.00	471.31	4304.97	97.70	4.27	4878.25	0.00	0.00
Nandipadu	0.00	0.00	67.99	2912.90	472.71	67.08	3520.68	0.00	5.92
Pandrangi	0.00	0.00	922.38	3938.48	4.79	0.00	4865.65	0.00	0.00
Sekunalapalli	0.00	0.00	122.09	3234.00	36.45	1.06	3393.61	0.00	0.00
Sitatampuram	0.00	0.00	248.12	2061.05	0.00	0.00	2309.17	0.00	0.00
Udayagiri (West)	0.00	0.00	214.05	2110.20	91.31	11.67	2427.23	0.00	40.77
Udayagiri West	0.00	4.12	1115.78	1457.89	3.36	0.00	2581.15	0.00	0.00
Varikuntapadu	0.00	0.69	40.21	2887.64	393.25	4.97	3326.75	0.00	-3.63
<b>Total</b>	<b>0.00</b>	<b>7.12</b>	<b>6623.62</b>	<b>40382.96</b>	<b>1900.34</b>	<b>286.25</b>	<b>49200.30</b>	<b>5.16</b>	<b>32.33</b>
<b>Venkatagiri Range</b>									
Alturpad	574.69	3954.10	829.24	1057.54	136.27	6.50	6558.35	0.00	0.00
Attivaram	0.00	0.37	166.39	802.70	1216.53	0.00	2185.99	0.00	0.00
Balayapalli	21.20	118.82	167.61	2651.34	1229.18	0.94	4189.09	0.00	6.94
Chaganam	4.34	1337.62	1641.60	1553.90	71.85	0.00	4609.30	3.92	-3.92
Chilamanur	7.69	81.84	210.70	1497.97	532.81	60.80	2391.81	0.00	-29.36
Chilamuru	0.00	12.89	1261.53	1728.54	2505.12	12.40	5520.48	0.00	0.00
Dachuru	271.94	1057.93	342.22	184.02	10.19	0.00	1866.30	0.00	0.00
Dakkili	67.44	192.17	268.25	1647.12	417.02	0.00	2592.00	4.48	-4.48
Davulapalli	439.18	2349.53	501.24	615.83	53.85	0.00	3959.63	0.00	0.00
Doravari Satram	0.00	0.00	397.33	949.52	1436.76	0.00	2783.61	0.00	0.00
Gilakapadu	6.69	1114.57	720.15	806.90	59.74	0.00	2708.05	0.00	2.12
Jayampu	33.79	63.47	301.02	1340.33	916.25	38.99	2693.86	0.00	0.00
Jorepalli	8.83	224.88	615.07	1521.68	246.94	0.00	2617.40	0.00	0.00
Kurjagunta	194.19	1240.97	627.58	1130.21	101.14	0.00	3294.08	3.84	19.94
Marlapudi	0.00	0.00	41.15	26.18	46.95	0.00	114.28	0.00	0.00
Naidupeta	0.00	0.00	113.48	554.33	604.68	0.00	1272.50	0.00	0.00
Palem Kota	828.79	1509.85	396.77	280.68	52.64	0.00	3068.72	0.00	0.00
Sullurupet	0.00	0.00	0.00	0.49	3.56	0.00	4.05	0.00	0.00
Teelthampadu	473.97	808.25	193.65	238.51	12.70	0.00	1727.08	0.00	0.00
Uggumudi	0.00	22.72	797.83	1189.89	923.41	0.00	2933.85	0.00	0.00
Vembulur	111.00	1339.66	295.50	416.16	124.78	0.00	2287.10	0.00	0.00
Yatalur	28.06	162.98	315.78	861.87	264.45	8.04	1641.17	0.00	9.30
<b>Total</b>	<b>3071.82</b>	<b>15592.61</b>	<b>10204.08</b>	<b>21055.69</b>	<b>10966.81</b>	<b>127.68</b>	<b>61018.69</b>	<b>12.24</b>	<b>0.54</b>
<b>Grand Total</b>	<b>5080.02</b>	<b>48663.57</b>	<b>46467.86</b>	<b>107377.36</b>	<b>27316.47</b>	<b>3090.55</b>	<b>237995.83</b>	<b>17.40</b>	<b>-306.28</b>



## 4.8 KADAPA DIVISION

### 4.8.1 Introduction:

Kadapa Forest Division lies in the middle of Kadapa district between latitudes 13° 50' 40" and 14° 40' 37" N and longitudes 78° 13' 9" and 79° 14' 39" E. Geographical area of the Division is 4521 Km<sup>2</sup> which is 29.44 % of the area of district. This Division lies on the Deccan Plateau. Altitude of northern, eastern and south - eastern region is less while that of the southern and south - western regions is more with altitude of 760M. The main rivers that flow through Kadapa Division are Penna, Papagni and Mandavi.

Land use pattern of the Division is given in Table 4.8.1

The climate of this Division is generally dry with temperatures ranging from 25°C to 40°C and the annual rainfall is about 661.22mm. The soil types found mainly are red loamy, black cotton and red sandy. The mineral resources in this Division are granites, barytes, asbestos and lime stone.

Population of the Division is 0.903 million (2011 Census), per capita forest area is 0.19 Ha and the population density is 202 persons per Km<sup>2</sup>.

Table 4.8.1: Land use Pattern

Land use	Area in Km <sup>2</sup>	Percentage
Forest including Scrub	1625.45	35.95
Agriculture	1721.55	38.08
Land with Scrub	359.63	7.95
Fallow Lands	602.52	13.33
Grasslands	0.25	0.01
Settlements	19.64	0.43
Vegetation outside Forest	140.98	3.12
Water Bodies	50.97	1.13
<b>Total</b>	<b>4521.00</b>	

### 4.8.2 Recorded Forest Area:

The notified forest area of the Division is **1928.69 Km<sup>2</sup>** which is 25.63% of the geographical area. Reserved and Protected Forests constitute 1,914.08 Km<sup>2</sup> (99.24%) and 14.61 Km<sup>2</sup> (0.76%) of the forest area respectively.

As per Champion and Seth's classification the forests of Division fall under Southern Tropical Dry Deciduous, Southern Tropical Thorn Mixed, Tropical Dry ever green and Dry Red Sanders bearing forest types. Red Sanders (*Pterocarpus santalinus*), an endemic tree species, is available in plenty in this Division.

### 4.8.3 Protected Area:

Parts of Sri Lankamalleswara Wildlife Sanctuary (LWS) and Sri Penusila Narasimha Wildlife Sanctuary (PNS) each fall in this Division. An area of 246.30 Km<sup>2</sup> is included in Sri Lankamalleswara WLS and an area of 272.53 Km<sup>2</sup> is included in Sri Penusila Narasimha WLS.

### 4.8.4 Community Forest Management:

There are 118 Vana Samrakshana Samithies (VSSs) in the Division. 394.08 Km<sup>2</sup> forest area, which constitutes 22.96 % of the forest area, 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 2012 data (Oct/Nov 2012) is **1053.68 Km<sup>2</sup>** which is **23.31%** of the geographical area. In terms of the forest canopy density classes the Division consists of **1.24 Km<sup>2</sup>** of Very Dense Forest, **158.06 Km<sup>2</sup>** of Moderately Dense Forest and **894.38 Km<sup>2</sup>** of Open Forest. The area of the Scrub is **586.02 Km<sup>2</sup>**, Non-Forest is **75.87 Km<sup>2</sup>** and Water Bodies is **0.98 Km<sup>2</sup>**. The distribution of the forest cover of the Division is shown in Fig 4.8.1

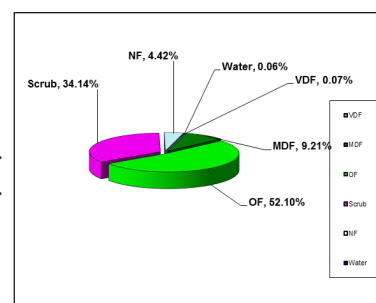


Fig 4.8.1

### 4.8.6 Change in Forest Cover:

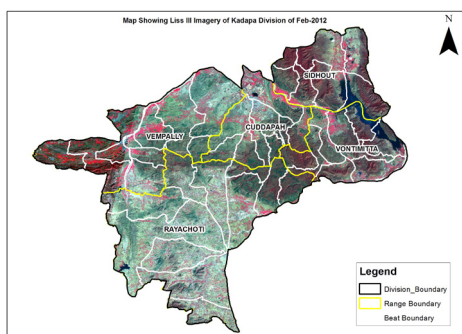
The satellite images of 2011 and 2012 are shown in Figs 4.8.2 & 4.8.3 respectively and the changes between this periods are shown on the image of 2012.



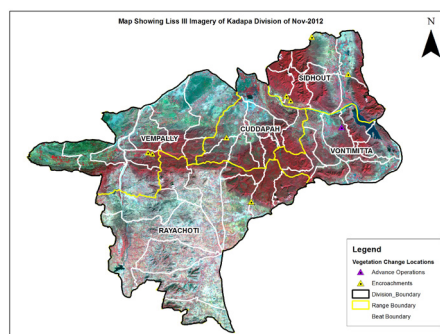
Comparison of the current forest cover with that of previous assessment year shows **negative change** in forest cover of **38.0 Ha**. The forest cover change matrix, given in Table 4.8.2 reveals that there is a decrease of **37.03Ha of open forest**.

The total negative change (including scrub) is **58.10 Ha**. Out of this **1.09Ha** is on account of clearance of jungle growth for raising of plantations and **57.01 Ha** is on account of encroachments. As 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 cover is 57.01 Ha** in the Division.

2011	2012						Total of 2011
	VDF	MDF	OF	SF	NF	WB	
Very Dense Forest	1.24	0.00	0.00	0.00	0.00	0.00	1.24
Moderately Dense Forest	0.00	158.06	0.00	0.00	0.00	0.00	158.06
Open Forest	0.00	0.00	894.38	0.30	0.08	0.00	894.76
Scrub	0.00	0.00	0.00	585.72	0.21	0.00	585.93
Non-Forest	0.00	0.00	0.00	0.00	75.58	0.00	75.58
Water	0.00	0.00	0.00	0.00	0.00	0.98	0.98
<b>Total of 2012</b>	<b>1.24</b>	<b>158.06</b>	<b>894.38</b>	<b>586.02</b>	<b>75.87</b>	<b>0.98</b>	<b>1716.55</b>
<b>Net Change</b>	<b>0.00</b>	<b>0.00</b>	<b>-0.38</b>	<b>0.09</b>	<b>0.29</b>	<b>0.00</b>	



**Fig 4.8.2**



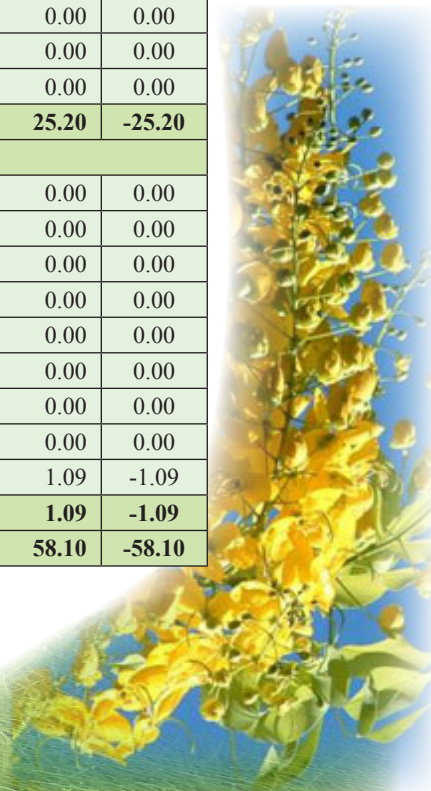
**Fig 4.8.3**

There are 45 Beats in the Division. Negative changes in forest cover are noticed in 8 Beats. There are no changes in the remaining 37 Beats.

Details of forest cover changes of 8 Beats along with all other beats are shown in Table 4.8.3

BEAT	VDF	MDF	OF	SF	NF	WB	Total	Enchro- chment	Net change
<b>Cuddapah Range</b>									
Bhakarapet	1.05	277.016	2635.24	108.31	0.511	0	3022.127	0.0	0.0
Ippapenta	0	33.799	1391.058	1354.183	4.777	6.452	2790.269	0.0	0.0
K.G.Penta	0	71.696	1692.962	394.917	3.504	0	2163.079	0.0	0.0
Kanumalopalli	0	8.661	1552.634	1643.944	58.872	0	3264.111	0.0	0.0
Maddimadgu_East	10.522	87.246	2847.603	1795.302	11.156	0	4751.829	0.0	0.0
Maddimadgu_West	0	100.326	1164.727	2586.243	120.854	0	3972.15	0.0	0.0
Mamillapalli	0	66.762	1313.76	1878.646	43.437	0	3302.605	0.0	0.0
Pullalamadugu	0	86.827	1651.443	1045.93	5.427	0	2789.627	0.0	0.0
Rasool palli	2.372	8.521	142.546	3361.631	276.847	0	3791.917	4.3	-4.3
<b>Total</b>	<b>13.94</b>	<b>740.854</b>	<b>14392</b>	<b>14169.1</b>	<b>525.39</b>	<b>6.45</b>	<b>29847.7</b>	<b>4.3</b>	<b>-4.3</b>

Table 4.8.3: List of Beats showing Forest Cover with changes									(Area in Ha)
BEAT	VDF	MDF	OF	SF	NF	WB	Total	Enchro- chment	Net change
<b>Rayachoti Range</b>									
Gadi_kota	0	365.458	4585.115	1422.906	110.837	0	6484.316	0.00	0.00
Guvvalacheruvu_ East	1.608	222.278	2824.813	720.995	5.847	0	3775.541	0.00	0.00
Guvvalacheruvu_ West	0	25.957	1057.255	1679.862	151.056	0	2914.13	0.00	0.00
Kesapuram Beat	0	31.148	1430.976	915.814	38.993	0	2416.931	0.00	0.00
Korthimadugu	3.671	217.157	4941.955	2017.19	114.114	0	7294.087	0.00	0.00
Madhavaram	0	0	375.676	2542.365	352.72	0	3270.761	0.00	0.00
Nadimpalli	0	175.683	2827.227	2404.134	40.943	0	5447.987	0.00	0.00
Pandillapalli	0.877	0	155.108	3348.28	581.935	0	4086.2	0.00	0.00
Saraswathipally	2.834	231.032	2044.021	2768.632	163.646	0	5210.165	5.76	-5.76
Surabhi	0	6.139	226.373	2270.368	605.297	0	3108.177	0.00	0.00
T.Sakibanda	0	24.356	550.548	786.394	93.232	0	1454.53	0.00	0.00
<b>Total</b>	<b>8.99</b>	<b>1299.21</b>	<b>21019.1</b>	<b>20876.9</b>	<b>2258.6</b>	<b>0</b>	<b>45462.8</b>	<b>5.76</b>	<b>-5.76</b>
<b>Sidhout Range</b>									
Gollapalli	0.951	360.589	3110.205	1127.326	35.693	0	4634.764	7.50	-7.50
Kondur	50.128	2133.369	3592.664	367.513	15.475	0	6159.149	6.71	-6.71
Maddur	12.732	1559.973	6090.427	411.673	9.866	0	8084.671	0.00	0.00
Muthukur	5.718	558.056	3116.858	537.215	7.902	0	4225.749	3.94	-3.94
Ponnapalli	0	1485.783	3133.991	22.049	1.283	5.769	4648.875	0.00	0.00
Rollabodu	5.656	1692.052	1141.447	30.311	0.01	0	2869.476	0.00	0.00
Siddavatam	5.694	1800.039	2909.988	253.266	7.478	0	4976.465	3.57	-3.57
<b>Total</b>	<b>80.879</b>	<b>9589.861</b>	<b>23095.58</b>	<b>2749.353</b>	<b>77.707</b>	<b>5.769</b>	<b>35599.149</b>	<b>21.72</b>	<b>-21.72</b>
<b>Vempally Range</b>									
Bonagundicheruvu	0.886	63.548	1530.494	1867.789	1064.06	0	4526.774	0.00	0.00
Chilekampalli	1.348	54.481	1074.109	2203.384	90.713	0	3424.035	0.00	0.00
Ellatur	0	22.804	1063.938	3228.041	130.875	0	4445.658	0.00	0.00
Gorlapalli	0	1.338	145.13	2112.432	272.18	0	2531.08	0.00	0.00
Idupulapaya	2.88	186.475	1559.615	1843.726	103.884	0	3696.58	25.20	-25.20
Nandimandalam	3.332	30.151	1088.272	2888.275	387.211	0	4397.241	0.00	0.00
Polathala	0	47.399	450.111	2703.476	173.728	0	3374.714	0.00	0.00
Rachakuntapally	0	19.306	336.855	867.796	869.344	0	2093.301	0.00	0.00
Vempally	5.328	40.545	338.031	934.089	1586	0	2903.991	0.00	0.00
<b>Total</b>	<b>13.77</b>	<b>466.047</b>	<b>7586.56</b>	<b>18649</b>	<b>4678</b>	<b>0</b>	<b>31393.4</b>	<b>25.20</b>	<b>-25.20</b>
<b>Vontimitta Range</b>									
Chintalakunta	0	537.552	1512.113	56.309	3.801	79.11	2188.888	0.00	0.00
Chintarajupalli	1.405	255.782	2278.885	104.679	9.98	0	2650.731	0.00	0.00
Dasarladoddi	0	1131.753	4125.577	245.083	5.408	0	5507.821	0.00	0.00
Madhavaram	4.734	560.479	2242.638	16.342	0.21	6.764	2831.167	0.00	0.00
Mantapampalli	0	223.092	1870.237	196.483	2.56	0	2292.372	0.00	0.00
Nadimpally	0	10.274	2171.138	709.552	8.661	0	2899.625	0.00	0.00
Nandalur	0.591	378.002	2390.195	167.265	0.702	0	2936.755	0.00	0.00
Patur	0	478.152	3180.803	177.799	1.553	0	3838.307	0.00	0.00
Vontimitta	0	134.291	3574.135	483.701	13.431	0	4205.558	1.09	-1.09
<b>Total</b>	<b>6.73</b>	<b>3709.38</b>	<b>23345.7</b>	<b>2157.21</b>	<b>46.306</b>	<b>85.9</b>	<b>29351.2</b>	<b>1.09</b>	<b>-1.09</b>
<b>Grand Total</b>	<b>124.3</b>	<b>15805.3</b>	<b>89438.9</b>	<b>58601.6</b>	<b>7586</b>	<b>98.1</b>	<b>171654</b>	<b>58.10</b>	<b>-58.10</b>





## 4.9 KURNOOL DIVISION

### 4.9.1. Introduction:

Kurnool Forest Division lies in the western part of Kurnool district between latitudes 14°56'49.56" and 15°57'49.68"N and longitudes 76°58'26.04" and 78°29'22.56"E. Geographical area of the Division is 12,904 Km<sup>2</sup> which is 73.07 % of the area of the district. The rock formation consists of shales, limestone and quartzite. The elevation in the Division varies from 305 to 579.5 M above MSL. The elevation of Kurnool town is about 288 M above MSL. The River Tungabhadra, a tributary of River Krishna, forms the northern boundary of the Division.

Land use pattern of the Division is given in Table 4.9.1

The climate of this Division is inland tropical monsoonic type with 3 distinct seasons. Temperature ranges from 12°C to 45°C and the average annual rainfall in the Division is about 523.24 mm.

Important minerals and rocks found in the Division are limestone, iron, red and yellow ochres, barytes, diamond, black and pink granite. The soil types found mainly are black cotton, red and saline.

Population of the Division is 3.12 million (2011 Census). The per capita forest area is 0.04Ha and the population density is 241 persons per Km<sup>2</sup>.

Table 4.9.1: Land use Pattern

Land use	Area in Km <sup>2</sup>	Percentage
Forest including Scrub	634.11	4.92
Agriculture	10048.40	77.84
Land with Scrub	705.85	5.47
Fallow Lands	1031.6	7.99
Grasslands	83.82	0.65
Settlements	113.53	0.88
Vegetation outside Forest	71.55	0.55
Water Bodies	215.14	1.67
<b>Total</b>	<b>12904.00</b>	

### 4.9.2. Recorded Forest Area:

The notified forest area of the Division is **1202.55 Km<sup>2</sup>** which is 9.58 % of the geographical area. Reserved, Protected and un-classed forests constitute 1154.45 Km<sup>2</sup> (96%), 37.17 Km<sup>2</sup> (3.09%) and 10.93 Km<sup>2</sup> (0.91%) of the forest area respectively.

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

### 4.9.3 Protected Area:

There is no Protected Area in the Division.

### 4.9.4. Community Forest Management:

There are 149 VSSs in the Division. An area of 392.62 Km<sup>2</sup> forests, which constitutes 32.65 % of forest area, is under CFM.

### 4.9.5. Forest Cover:

The forest cover in the Division based on the interpretation of IRS R2 LISS III 2012 data (NOV 2012) is **149.1 Km<sup>2</sup>** which is **1.15 %** of the geographical area. In terms of the forest canopy cover density classes, the Division has **1.13 Km<sup>2</sup>** of Moderately Dense Forests and **147.97 Km<sup>2</sup>** of Open Forests. The area of the Scrub is **356.11 Km<sup>2</sup>**, Non-Forests **696.01 Km<sup>2</sup>** and Water Bodies **1.32 Km<sup>2</sup>**. The distribution of the forest cover of the Division is shown in Fig 4.9.1

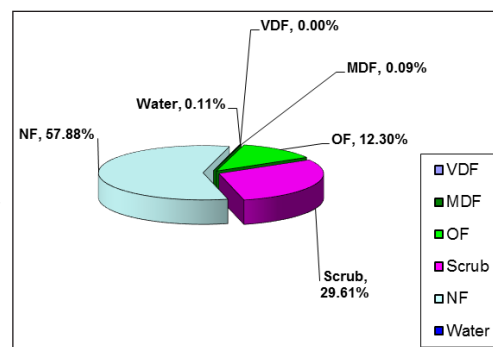


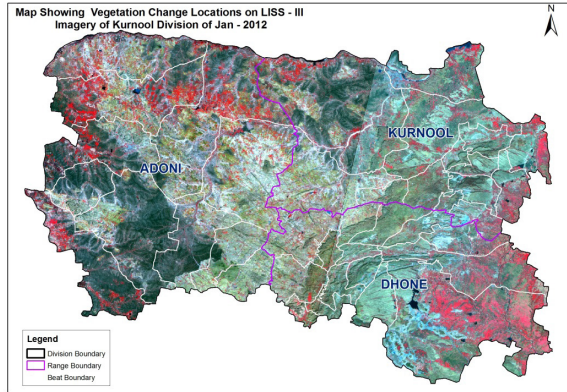
Fig 4.9.1

#### 4.9.6. Change in Forest cover:

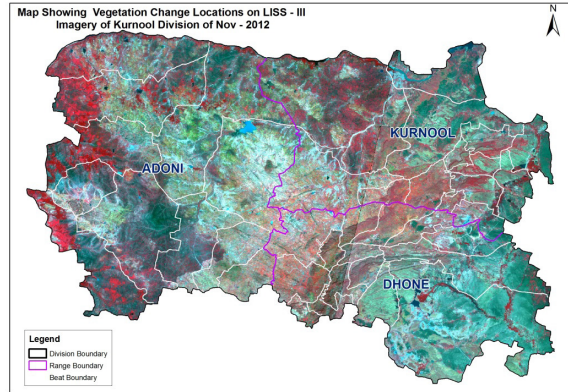
The satellite images of 2011 and 2012 are shown in Figs 4.9.2 & 4.9.3 respectively.

Comparison of the current forest cover with that of previous assessment year shows **no change in the forest cover**. The forest cover change matrix is given in Table 4.9.2.

Therefore, there is **no net loss of forest cover** in the Division.



**Fig. 4.9.2**



**Fig. 4.9.3**

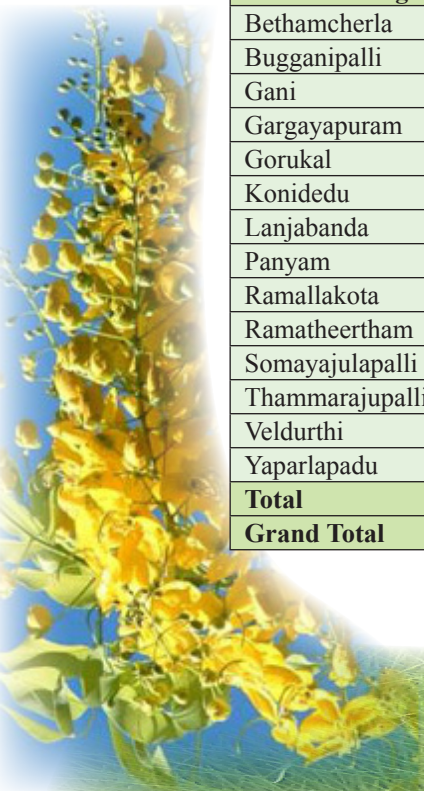
There are 40 Beats in the Division. There are no changes in the forest cover in any of the 40 Beats during the period.

Table 4.9.2: Forest Cover change matrix							(Area in Km <sup>2</sup> )
2011	2012						Total of 2011
	VDF	MDF	OF	SF	NF	Water	
Very Dense Forest	0.00	0.00	0.00	0.00	0.00	0.00	<b>0.00</b>
Moderately Dense Forest	0.00	1.13	0.00	0.00	0.00	0.00	<b>1.13</b>
Open Forest	0.00	0.00	147.97	0.00	0.00	0.00	<b>147.97</b>
Scrub	0.00	0.00	0.00	356.11	0.00	0.00	<b>356.11</b>
Non-Forest	0.00	0.00	0.00	0.00	696.01	0.00	<b>696.01</b>
Water	0.00	0.00	0.00	0.00	0.00	1.32	<b>1.32</b>
<b>Total of 2012</b>	<b>0.00</b>	<b>1.13</b>	<b>147.97</b>	<b>356.11</b>	<b>696.01</b>	<b>1.32</b>	<b>1202.55</b>
<b>Net Change</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	





Table 4.9.3: List of Beats showing Forest Cover with changes							(Area in Ha)	
BEAT	MDF	OF	SF	NF	WB	Total	Encroachment	Net Change
<b>Adoni Range</b>								
Gulyam	2.64	166.02	174.35	305.10	0.00	648.10	0.00	0.00
Gundlakonda	0.00	33.57	441.71	2,559.35	0.00	3,034.63	0.00	0.00
Isvi	0.00	11.71	61.52	2,673.54	0.00	2,746.77	0.00	0.00
Jonnagiri	0.00	3.87	154.64	1,332.94	0.00	1,491.45	0.00	0.00
Kotekallu	0.00	4.69	63.36	1,298.60	0.00	1,366.65	0.00	0.00
Kuppagallu	3.93	99.54	184.70	1,080.29	0.00	1,368.46	0.00	0.00
Narineki_East	0.00	2.51	18.12	2,136.80	0.00	2,157.42	0.00	0.00
Narineki_West	0.00	13.66	128.42	2,397.29	0.00	2,539.36	0.00	0.00
Pattikonda	0.00	2.40	150.25	1,161.15	0.00	1,313.80	0.00	0.00
Tuggali	0.00	10.32	332.92	1,472.11	0.00	1,815.35	0.00	0.00
Tungabadra	0.00	96.99	84.28	666.27	0.00	847.53	0.00	0.00
<b>Total</b>	<b>6.56</b>	<b>445.26</b>	<b>1,794.28</b>	<b>17,083.43</b>	<b>0.00</b>	<b>19,329.54</b>	<b>0.00</b>	<b>0.00</b>
<b>Dhone Range</b>								
Aliabad	0.00	200.48	282.68	5,482.15	0.00	5,965.31	0.00	0.00
Chintalapeta	0.52	111.28	1,580.17	1,311.93	0.00	3,003.90	0.00	0.00
Dhone	2.15	561.40	2,040.58	460.41	0.00	3,064.55	0.00	0.00
Erragudi	0.00	127.04	211.66	1,681.31	0.55	2,020.56	0.00	0.00
Gulmaliabad	4.23	489.25	1,465.39	3,583.46	5.14	5,547.46	0.00	0.00
Jaladurgam	0.92	1,406.73	2,423.80	1,613.18	0.00	5,444.64	0.00	0.00
Madhavaram	0.00	85.68	622.81	1,691.45	0.00	2,399.93	0.00	0.00
Malkapuram	0.00	302.16	2,102.28	981.94	0.00	3,386.38	0.00	0.00
Malyala	0.32	132.62	779.52	1,242.75	6.65	2,161.85	0.00	0.00
Narayanapuram	0.45	338.79	653.90	284.60	0.00	1,277.74	0.00	0.00
Ouk	15.80	669.15	899.95	7,744.09	77.76	9,406.76	0.00	0.00
Peapully	0.74	721.09	1,941.07	497.08	0.00	3,159.98	0.00	0.00
Peddapaya	0.00	532.22	1,684.06	712.64	0.00	2,928.91	0.00	0.00
Racherla	0.00	362.96	1,273.50	2,059.14	0.00	3,695.59	0.00	0.00
Rangapuram	0.74	237.84	798.67	1,400.81	0.00	2,438.06	0.00	0.00
<b>Total</b>	<b>25.88</b>	<b>6,278.68</b>	<b>18,760.02</b>	<b>30,746.94</b>	<b>90.10</b>	<b>55,901.61</b>	<b>0.00</b>	<b>0.00</b>
<b>Kurnool Range</b>								
Bethamcherla	9.64	1,691.67	2,355.85	607.53	0.00	4,664.69	0.00	0.00
Bugganipalli	0.00	115.20	773.21	563.95	0.00	1,452.36	0.00	0.00
Gani	3.14	555.51	1,350.08	1,712.51	0.00	3,621.23	0.00	0.00
Gargayapuram	5.01	344.53	1,548.12	312.20	0.00	2,209.87	0.00	0.00
Gorukal	17.29	172.70	118.49	3,470.46	5.58	3,784.52	0.00	0.00
Konidedu	23.00	1,806.19	1,984.24	4,106.97	0.41	7,920.81	0.00	0.00
Lanjabanda	5.61	636.40	1,817.38	453.69	0.00	2,913.08	0.00	0.00
Panyam	1.40	221.77	377.08	3,045.69	0.27	3,646.21	0.00	0.00
Ramallakota	8.95	441.00	930.72	590.41	0.00	1,971.08	0.00	0.00
Ramatheertham	0.00	87.45	653.08	2,001.40	24.56	2,766.49	0.00	0.00
Somayajulapalli	0.86	290.63	733.38	1,003.23	0.00	2,028.10	0.00	0.00
Thammarajupalli	1.90	831.92	636.32	2,151.16	0.00	3,621.30	0.00	0.00
Veldurthi	0.48	106.47	76.63	106.54	10.13	300.25	0.00	0.00
Yaparlapadu	2.99	771.93	1,702.43	1,645.35	1.05	4,123.74	0.00	0.00
<b>Total</b>	<b>80.28</b>	<b>8,073.33</b>	<b>15,057.01</b>	<b>21,771.09</b>	<b>41.99</b>	<b>45,023.71</b>	<b>0.00</b>	<b>0.00</b>
<b>Grand Total</b>	<b>112.72</b>	<b>14,797.28</b>	<b>35,611.31</b>	<b>69,601.46</b>	<b>132.09</b>	<b>1,20,254.86</b>	<b>0.00</b>	<b>0.00</b>



## 4.10 NANDYAL DIVISION

### 4.10.1 Introduction:

Nandyal Forest Division lies in the south-eastern part of Kurnool district between latitudes 14°53'58.56" and 15°40'58.08"N and longitudes 78°20'27.6" and 78°46'40.08" E. Geographical area of the Division is 2,600 Km<sup>2</sup> which is 14.73 % of the geographical area of the district. The rock formation consists of purple shaley lime stone, shale flags, grey lime stone and flags. The maximum elevation in the Division is 908.68 M above MSL. Important Rivers in this Division are Kundu & Gundlakamma.

Land use pattern of the Division is given in Table 4.10.1

The climate of this Division is generally dry with temperatures ranging from 20°C to 40°C and the average annual rainfall is about 914 mm, received mainly from South-west monsoons.

The soil types found mainly are Black cotton, Alluvial, Brown loamy and Red.

Population of the Division is 0.62 million (2011 Census). The per capita forest area is 0.17 Ha and the population density is 239 persons per Km<sup>2</sup>.

**Table 4.10.1: Land use Pattern**

Land use	Area in Km <sup>2</sup>	Percentage
Forest including Scrub	999.59	38.45
Agriculture	1498.64	57.63
Land with Scrub	48.75	1.87
Fallow Lands	7.41	0.29
Grasslands	0.00	0.00
Settlements	11.86	0.46
Vegetation outside Forest	14.21	0.55
Water bodies	19.54	0.75
<b>Total</b>	<b>2600.00</b>	

### 4.10.2 Recorded Forest Area:

The notified forest area of the Division is **1066.46 Km<sup>2</sup>** which is 41.02 % of the geographical area. The entire forest area is Reserved Forest.

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

### 4.10.3 Protected Area:

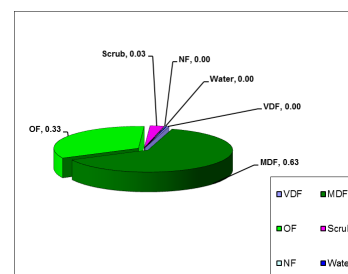
A part of Gundla Brahmeswaram (GBM) Wildlife Sanctuary falls in this Division. Out of the total area of 1,066.46 Km<sup>2</sup> of notified forests, an area of 371.81 Km<sup>2</sup> is included in the GBM WLS.

### 4.10.4 Community Forest Management:

There are 51 Vana Samrakshana Samities (VSSs) or Joint Forest Protection Committees (JFPCs) in the Division. An area of 166.84 Km<sup>2</sup> forests, which is 15.64 % 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 2012 data (Oct 2012) is **1033.54 Km<sup>2</sup>** which is **39.75%** of the geographical area. In terms of the forest canopy density classes, the Division has **4.58 Km<sup>2</sup>** of Very Dense Forests, **672.15 Km<sup>2</sup>** of Moderately Dense Forests and **356.81 Km<sup>2</sup>** of Open Forests. The area of the Scrub is **28.70 Km<sup>2</sup>**, Non-Forest **1.97 Km<sup>2</sup>** and Water Bodies **2.25 Km<sup>2</sup>**. The distribution of the forest cover of the Division is shown in Fig 4.10.1



**Fig.4.10.1**

### 4.10.6 Change in Forest Cover:

The Satellite images of 2011 and 2012 have been shown in Fig (4.10.2 & Fig 4.10.3) and the changes between this period are shown on the image of 2012.



Comparison of the current forest cover with that of previous assessment year shows a **negative change of 82.30 Ha** and positive change of **343.99 Ha**. The forest cover change matrix given in Table 4.10.2 reveals that there is a decrease of **74.84 Ha** in open forest and **7.46 Ha** of dense forest. The **positive change** in forest cover as indicated in the forest cover change matrix is **118.39 Ha**, which is attributed to improved cover in open forest.

The total positive change is **669.20 Ha** and the total negative change (including scrub) is **94.03 Ha**. Of this, **35.73 Ha** is on account of clearance of jungle growth for raising of plantations and **58.30 Ha** is on account of harvesting plantations. As clearance of jungle growth for raising of plantations are forest management interventions, the same are not considered as loss of forest cover. Thus the negative change due to encroachment alone is taken as loss of forest cover. Therefore, there is **no net loss in forest cover**.

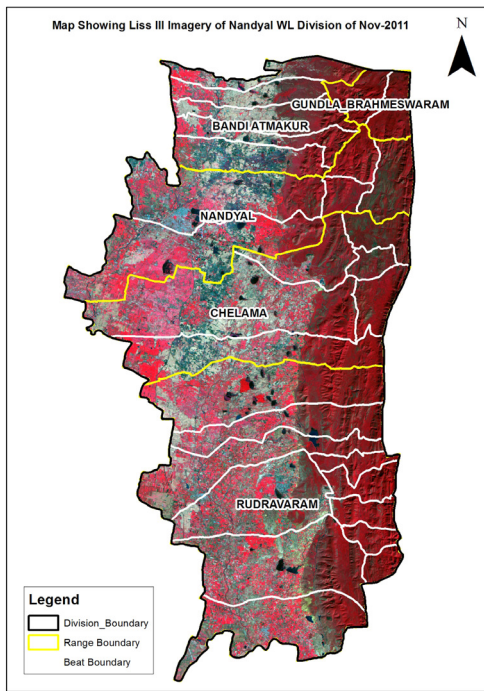


Fig 4.10.2

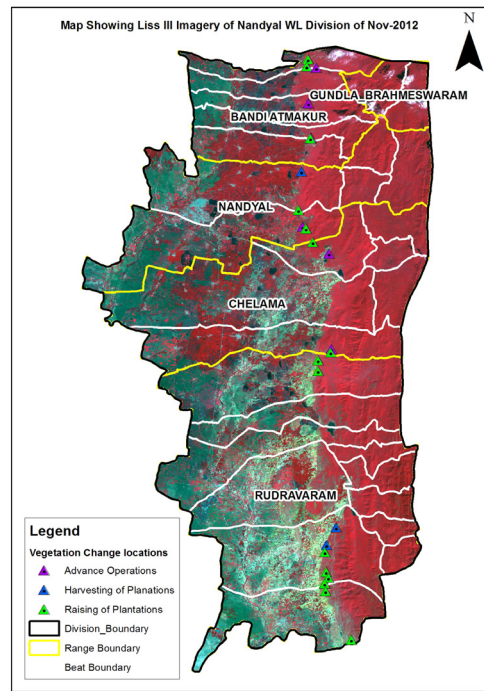


Fig 4.10.3

Negative changes in forest cover are noticed in 2 Beats and positive changes are noticed in 8 Beats. There are no changes in remaining 19 Beats.

Details of forest cover changes in the 10 Beats mentioned above are shown in Table 4.10.3

and there are no changes in the forest cover during the period in any of the remaining 19 Beats.

Table 4.10.2: Forest Cover change matrix							(Area in Km <sup>2</sup> )
2011	2012						Total of 2011
	VDF	MDF	OF	SF	NF	Water	
Very Dense Forest	4.58	0.00	0.00	0.00	0.00	0.00	4.58
Moderately Dense Forest	0.00	669.89	0.00	0.07	0.00	0.00	669.96
Open Forest	0.00	2.26	355.63	0.05	0.69	0.00	358.63
Scrub	0.00	0.00	1.14	25.33	0.12	0.00	26.59
Non-Forest	0.00	0.00	0.04	3.25	1.16	0.00	4.45
Water	0.00	0.00	0.00	0.00	0.00	2.25	2.25
<b>Total of 2012</b>	<b>4.58</b>	<b>672.15</b>	<b>356.81</b>	<b>28.70</b>	<b>1.97</b>	<b>2.25</b>	<b>1066.46</b>
<b>Net Change</b>	<b>0.00</b>	<b>2.19</b>	<b>-1.82</b>	<b>2.11</b>	<b>-2.48</b>	<b>0.00</b>	

Table 4.10.3: List of Beats showing Forest Cover with changes								(Area in Ha)
BEAT	VDF	MDF	OF	SF	NF	WB	Total	Net Change
<b>Bandi Atmakur Range</b>								
G.C.Palem	0.00	1,566.56	2,467.55	167.87	35.09	0.73	4,237.80	-5.46
Honkaram_North	0.00	1,574.02	792.56	7.70	2.23	0.00	2,376.51	-0.83
Honkaram_South	0.00	1,378.74	641.74	32.28	11.65	5.47	2,069.88	0.00
Narapureddy_Kunta_N	0.00	1,021.57	1,737.97	291.26	-138.90	0.00	2,911.90	165.87
Narapureddy_Kunta_S	0.00	366.23	1,580.41	68.05	6.12	0.00	2,020.81	0.00
<b>Total</b>	<b>0.00</b>	<b>5,914.58</b>	<b>7,203.37</b>	<b>427.21</b>	<b>65.54</b>	<b>6.20</b>	<b>13,616.89</b>	<b>159.58</b>
<b>Chelama Range</b>								
Basavapuram	0.72	2,570.24	2,384.10	117.90	32.22	1.22	5,106.39	46.77
Chelama	0.00	1,587.42	2,641.59	58.84	12.21	0.00	4,300.06	0.00
Dongabhavi	0.00	707.11	1,443.63	57.27	2.67	0.00	2,210.68	0.00
Kotakonda	45.76	3,060.21	1,145.32	73.04	2.07	0.00	4,326.40	0.00
Pacherla	0.73	3,482.43	1,020.40	6.20	0.00	0.00	4,509.76	0.00
Peddakambalur	10.78	4,009.16	473.97	42.53	12.94	0.00	4,549.37	122.63
<b>Total</b>	<b>57.99</b>	<b>15,230.49</b>	<b>9,311.74</b>	<b>355.77</b>	<b>45.43</b>	<b>1.22</b>	<b>25,002.64</b>	<b>169.40</b>
<b>Gundla_brahmeswaram Range</b>								
Ramanapenta_East	1.27	3,686.31	275.02	0.00	0.00	0.00	3,962.59	0.00
Ramanapenta_West	3.59	3,640.93	446.73	0.00	0.00	0.00	4,091.25	0.00
<b>Total</b>	<b>4.86</b>	<b>7,327.24</b>	<b>721.75</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>8,053.84</b>	<b>0.00</b>
<b>Nandyal Range</b>								
Baireni	0.91	2,484.70	3,537.56	91.45	0.00	0.00	6,114.62	0.00
Gadigundaram	16.62	3,048.62	331.22	2.87	0.00	0.00	3,399.33	0.00
Palardam	0.00	2,116.22	526.85	8.46	0.00	0.00	2,651.53	0.00
Prema	17.18	2,339.05	1,047.15	17.96	12.54	0.00	3,433.88	58.86
Thimmapuram	6.62	1,628.90	668.47	23.42	1.28	0.00	2,328.69	7.56
<b>Total</b>	<b>41.34</b>	<b>11,617.50</b>	<b>6,033.09</b>	<b>235.31</b>	<b>0.81</b>	<b>0.00</b>	<b>17,928.05</b>	<b>66.42</b>
<b>Rudravaram Range</b>								
Ahobilam_North	103.72	3,009.09	431.05	3.39	0.70	0.00	3,547.94	0.00
Ahobilam_South	57.58	2,694.80	304.17	10.84	1.49	0.83	3,069.71	0.00
Bachepalli	49.44	1,890.20	196.33	0.00	0.00	0.00	2,135.97	0.00
D.V.Penta	16.75	3,479.91	3,092.86	232.09	6.20	4.81	6,832.62	47.18
Madambhavi	0.39	2,941.00	1,988.30	112.11	23.33	91.53	5,156.67	0.00
Mittapalli	1.24	667.74	1,938.18	809.48	107.53	0.00	3,524.17	0.00
Nuthala_North	4.90	1,624.79	717.73	31.48	11.15	97.60	2,487.64	0.00
Nuthala_South	66.27	2,218.30	299.45	1.01	0.00	0.00	2,585.03	0.00
Peddavangli	7.83	1,862.96	2,065.17	590.48	54.75	22.39	4,603.58	93.05
Rudravaram	7.47	4,881.08	1,256.99	13.46	0.00	0.00	6,158.99	0.00
Utlal	38.55	1,675.90	228.76	0.00	0.00	0.00	1,943.21	39.54
<b>Total</b>	<b>354.13</b>	<b>26,906.22</b>	<b>12,593.33</b>	<b>1,641.08</b>	<b>333.60</b>	<b>217.16</b>	<b>42,045.52</b>	<b>179.77</b>
<b>Grand Total</b>	<b>458.31</b>	<b>66,996.02</b>	<b>35,863.28</b>	<b>2,659.37</b>	<b>445.38</b>	<b>224.58</b>	<b>106,646.94</b>	<b>575.17</b>





## 4.11 PRODDUTUR DIVISION

### 4.11.1 Introduction:

Proddutur Forest Division lies in the northern part of Kadapa district between latitudes 14° 19' 37" and 15° 13' 43" N and longitudes 77° 56' 43" and 79° 17' 38" E. Geographical area of the Division is 7,524 Km<sup>2</sup> which is 48.99 % of the geographical area of the district. The main rivers that flow through the Division are Penna, Chitravathi, Kunderu, Papaghni, Sagileru and Mogamneru.

Land use pattern of the Division is given in Table 4.11.1

The climate of this Division is generally dry with temperatures ranging from 25°C to 40°C and the annual rainfall is about 661.22mm, received mainly from south-west monsoons.

The soil types found mainly are red loamy, black cotton & red sandy. The important minerals available are granites, barytes, asbestos and lime stone.

Population of the Division is 1.34 million (2011 Census), the per capita forest area is 0.12 Ha and the population density is 184 persons per Km<sup>2</sup>.

**Table 4.11.1: Land use Pattern**

Land use	Area in Km <sup>2</sup>	Percentage
Forest including Scrub	1285.95	17.09
Agriculture	4343.95	57.73
Land with Scrub	500.77	6.66
Fallow Lands	1101.21	14.64
Grasslands	1.56	0.02
Settlements	31.78	0.42
Vegetation outside Forest	115.58	1.54
Water Bodies	143.20	1.90
<b>Total</b>	<b>7524.00</b>	

### 4.11.2 Recorded Forest Area:

The notified forest area of the Division is **1663.35 Km<sup>2</sup>** which is 39.13% of the geographical area. Reserved and Protected Forests constitute 1,549.48 Km<sup>2</sup> (93.15%) and 114.07 Km<sup>2</sup> (6.86%) of the forest area respectively.

As per Champion and Seth's classification, the forests of this division fall under Southern Tropical Dry Deciduous, Southern Tropical Thorn Mixed, Tropical Dry Ever green and Dry Red Sanders bearing forest types. Red Sanders (*Pterocarpus santalinus*), a highly endemic tree species, is found in plenty in this Division.

### 4.11.3 Protected Area:

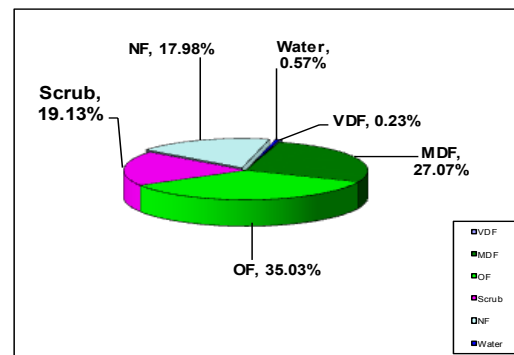
Parts of two PAs fall in this Division. An area of 218.12 Km<sup>2</sup> is included in Sri Lankamalleswara WLS and an area of 133.74 Km<sup>2</sup> is included in Sri Peninsula Narasimha WLS. Besides, Rajiv Gandhi National Park is also located in this Division. It covers an area of 3.82 Km<sup>2</sup>.

### 4.11.4 Community Forest Management:

There are 128 Vana Samrakshana Samities (VSSs) in the Division. An area of 456.38 Km<sup>2</sup>, which is 28.97% of the notified forest area, 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 2012 data (Oct -10-2012) is **979.86Km<sup>2</sup>** which is **13.02%** of the geographic area. In terms of the forest canopy density classes the Division has 2.55 Km<sup>2</sup> of Very Dense Forests and 77.30 Km<sup>2</sup> of Moderately Dense Forests and 900.01 Km<sup>2</sup> of Open Forests. The area of the Scrub is of **545.64 Km<sup>2</sup>**, Non-Forest of **45.65 Km<sup>2</sup>** and Water Bodies of **3.96 Km<sup>2</sup>**. The distribution 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 2011 and 2012 are shown in Figs 4.11.2 & 4.11.3 respectively and the changes between this period are shown on the image of 2012.

Comparison of the current forest cover with that of previous assessment year shows a **negative change of 44.65Ha**. The forest cover change matrix given in table 4.11.2 reveals that there is a decrease of **44.00 Ha** in open forest and **32.00 Ha** in scrub.

The total positive change (including scrub) of **3.90 Ha** is on account of growth in raised plantations. The negative change (including scrub) of **117.52 Ha** includes **109.10 Ha** on account of clearance of jungle growth for raising of plantations and **8.42 Ha** is due to 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. Therefore, the **net loss of forest cover in the Division is 8.42 Ha**.

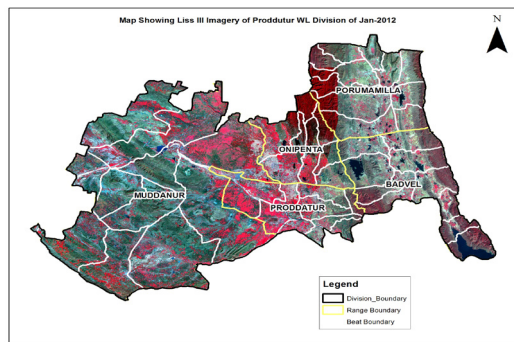


Fig 4.11.2

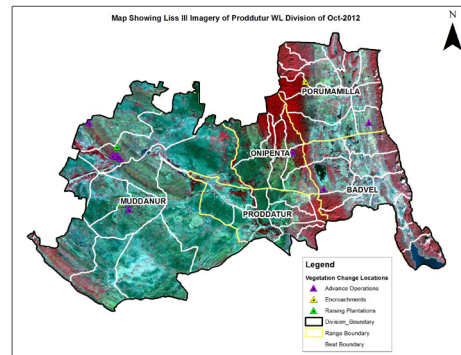


Fig 4.11.3

There are 45 Beats in the Division. Negative changes in forest cover are noticed only in 7 Beats. There are no changes in the remaining 38 Beats.

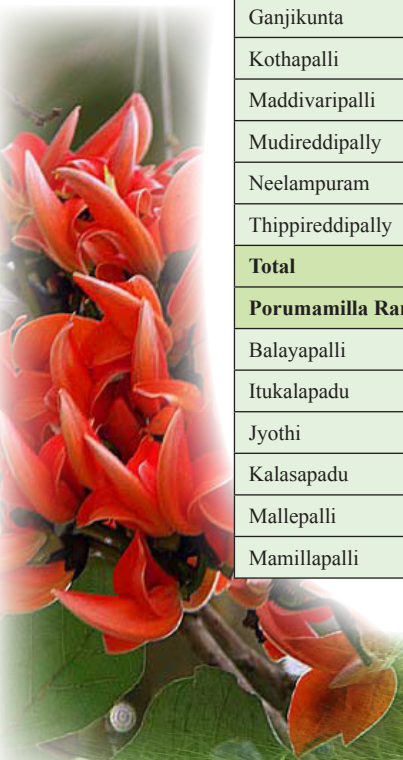
Details of forest cover changes in the above mentioned 7 Beats along with the remaining beats are shown in Table 4.11.3

Table 4.11.2: Forest Cover change matrix							(Area in Km <sup>2</sup> )
2011	2012						Total of 2011
	VDF	MDF	OF	SF	NF	Water	
Very Dense Forest	2.55	0.00	0.00	0.00	0.00	0.00	2.55
Moderately Dense Forest	0.00	77.30	0.00	0.00	0.00	0.00	77.30
Open Forest	0.00	0.00	900.01	0.37	0.07	0.00	900.45
Scrub	0.00	0.00	0.00	545.23	0.73	0.00	545.96
Non-Forest	0.00	0.00	0.00	0.04	44.85	0.00	44.89
Water	0.00	0.00	0.00	0.00	0.00	3.96	3.96
<b>Total of 2012</b>	<b>2.55</b>	<b>77.30</b>	<b>900.01</b>	<b>545.64</b>	<b>45.65</b>	<b>3.96</b>	<b>1575.11</b>
<b>Net Change</b>	<b>0.00</b>	<b>0.00</b>	<b>-0.44</b>	<b>-0.32</b>	<b>0.76</b>	<b>0.00</b>	

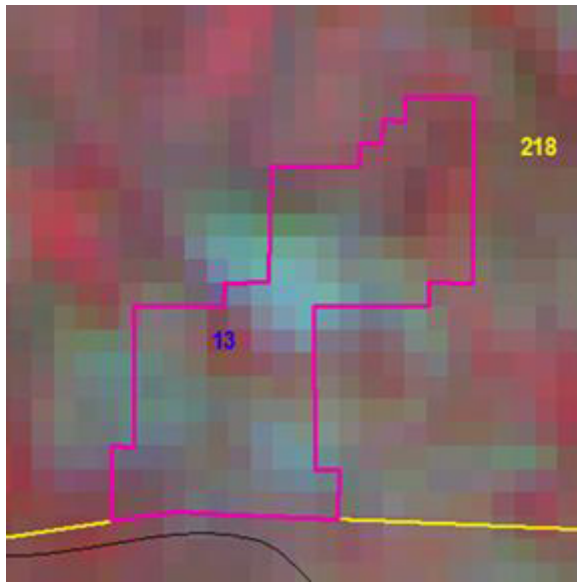




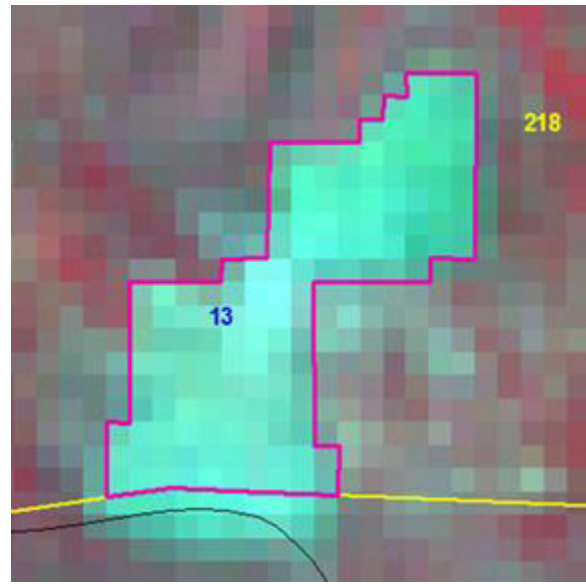
Table 4.11.3: List of Beats showing Forest Cover with changes.								(Area in Ha)	
Beat	VDF	MDF	OF	SF	NF	WB	Total	Encroachment	Net Change
<b>Badvel Range</b>									
Balayapalli	119.72	1183.63	3552.48	28.50	0.00	0.00	4884.33	0.00	-29.82
Boyanapalli	0.00	158.62	4404.70	111.94	0.00	0.00	4675.26	0.00	0.00
Brahmanapalli	5.22	525.84	3278.86	23.07	0.00	0.00	3833.00	0.00	0.00
Gangireddipalli	0.00	1.67	1805.70	228.00	0.00	0.00	2035.38	0.00	0.00
Ganugapenta	0.60	131.18	4499.28	100.52	0.00	0.00	4731.58	0.00	0.00
Jangamrajupalli	2.58	1.55	2046.88	377.73	0.00	122.53	2551.27	0.00	0.00
Lothuvankapalli	32.33	732.20	4762.16	81.57	0.00	0.00	5608.25	0.00	0.00
Obulam	51.98	1458.86	4291.60	16.90	0.00	44.12	5863.45	0.00	0.00
Ramapuram	1.56	287.57	2794.40	79.10	0.00	0.00	3162.63	0.00	0.00
Valleruvaripalli	0.00	203.64	5119.14	193.87	0.00	0.00	5516.64	0.00	0.00
<b>Total</b>	<b>213.99</b>	<b>4684.77</b>	<b>36555.19</b>	<b>1241.20</b>	<b>0.00</b>	<b>166.64</b>	<b>42861.79</b>	<b>0.00</b>	<b>-29.82</b>
<b>Muddanur Range</b>									
Bhanukotamala	0.00	0.00	56.63	3831.98	716.24	10.51	4615.36	0.00	-12.22
Dhodium	0.00	0.00	1.91	1898.53	1435.06	11.94	3347.44	0.00	-7.33
Dorigallu_East	0.00	36.79	74.96	2323.25	137.26	0.84	2573.09	0.00	0.00
Dorigallu_West	0.91	28.22	17.57	2944.67	552.23	7.57	3551.16	0.00	0.00
Gundlur	0.00	9.61	29.61	2302.58	330.20	4.34	2676.34	0.00	-45.46
Kalamala	0.00	2.16	11.31	2713.75	276.97	13.27	3017.46	0.00	0.00
Mallela	0.00	0.00	0.00	1429.00	366.07	5.82	1800.89	0.00	0.00
Mangapatnam	0.00	0.00	32.88	1597.77	326.33	1.38	1958.37	0.00	0.00
Settivaripalli	0.00	0.90	60.86	3232.88	236.68	13.52	3544.83	0.00	0.00
Venkayakalva	0.00	0.00	2.01	156.05	27.69	0.00	185.74	0.00	0.00
<b>Total</b>	<b>0.91</b>	<b>77.67</b>	<b>287.73</b>	<b>22430.47</b>	<b>4404.72</b>	<b>69.18</b>	<b>27270.68</b>	<b>0.00</b>	<b>-65.01</b>
<b>Onipenta Range</b>									
Gangayapalli	0.00	2.03	990.50	600.82	0.66	3.97	1597.98	0.00	0.00
Ganjikunta	0.00	45.51	1455.26	1158.81	0.00	51.72	2711.30	0.00	0.00
Kothapalli	0.00	61.05	2700.89	1166.30	0.00	57.56	3985.80	0.00	0.00
Maddivaripalli	0.00	1.48	1420.33	1177.24	0.00	21.41	2620.46	0.00	-7.50
Mudireddipally	0.31	32.74	3306.19	1067.21	0.00	0.00	4406.45	0.00	0.00
Neelampuram	2.48	2.99	2195.79	1420.58	0.00	0.00	3621.84	0.00	0.00
Thippireddipally	0.23	119.32	4446.95	299.43	0.00	0.00	4865.92	0.00	0.00
<b>Total</b>	<b>3.02</b>	<b>265.11</b>	<b>16515.90</b>	<b>6890.37</b>	<b>0.66</b>	<b>134.67</b>	<b>23809.73</b>	<b>0.00</b>	<b>-7.50</b>
<b>Porumamilla Range</b>									
Balayapalli	0.00	313.59	2222.03	3945.22	13.82	10.04	6504.70	8.42	-8.42
Itukalapadu	2.76	286.63	4057.13	497.23	0.00	0.00	4843.74	0.00	0.00
Jyothi	3.95	567.75	3890.10	825.78	0.00	0.00	5287.58	0.00	0.00
Kalasapadu	0.00	0.00	27.85	2454.28	0.00	0.00	2482.13	0.00	0.00
Mallepalli	0.00	55.37	4607.55	498.57	0.00	0.00	5161.50	0.00	0.00
Mamillapalli	0.00	1.32	69.72	3063.95	8.52	0.00	3143.52	0.00	0.00



Peddabhavi	0.00	108.47	1019.47	3779.09	15.31	3.65	4925.98	0.00	0.00
Siddavaram	0.00	103.24	3092.67	48.48	2.87	0.00	3247.26	0.00	-2.87
Tekurupet	0.00	47.94	3228.13	433.17	0.00	0.00	3709.24	0.00	0.00
Thaduku	0.00	515.80	3332.14	1807.70	0.00	0.00	5655.63	0.00	0.00
Venkatapuram	0.00	48.76	1628.71	2425.28	0.00	0.00	4102.75	0.00	0.00
<b>Total</b>	<b>6.70</b>	<b>2048.87</b>	<b>27175.49</b>	<b>19778.75</b>	<b>40.52</b>	<b>13.69</b>	<b>49064.02</b>	<b>8.42</b>	<b>-11.29</b>
<b>Proddatur Range</b>									
Balasinganapally	0.02	16.00	2058.06	1069.59	0.00	0.00	3143.67	0.00	0.00
Byanapalli	0.52	50.45	1273.88	726.93	0.00	0.00	2051.78	0.00	0.00
Jandlavaram	16.82	486.26	2328.04	83.72	0.00	0.00	2914.84	0.00	0.00
Kamalapuram	0.72	1.18	90.11	57.81	0.00	0.00	149.82	0.00	0.00
Nagasanipalli	8.14	30.68	1546.00	606.35	0.00	0.00	2191.16	0.00	0.00
Pattur	2.93	40.71	1899.32	796.03	0.00	0.00	2738.99	0.00	0.00
Proddatur	1.03	28.97	270.31	883.29	119.60	11.98	1315.16	0.00	0.00
<b>Total</b>	<b>30.17</b>	<b>654.23</b>	<b>9465.71</b>	<b>4223.72</b>	<b>119.60</b>	<b>11.98</b>	<b>14505.41</b>	<b>0.00</b>	<b>0.00</b>
<b>Grand Total</b>	<b>254.78</b>	<b>7730.66</b>	<b>90000.02</b>	<b>54564.52</b>	<b>4565.49</b>	<b>396.16</b>	<b>157511.62</b>	<b>8.42</b>	<b>-113.62</b>



2011



2012

<b>Longitude</b>	<b>78.84257 ° E</b>
<b>Latitude</b>	<b>15.07116 ° N</b>
<b>Area in Ha</b>	<b>8.42</b>
<b>Change</b>	<b>Negative</b>
<b>Comp No.</b>	<b>218</b>
<b>Beat</b>	<b>Balayapalli</b>
<b>Range</b>	<b>Porumamilla</b>
<b>Division</b>	<b>Proddatur</b>





## 4.12 ELURU DIVISION

### 4.12.1 Introduction:

Eluru Forest Division lies in the north-eastern part of Andhra Pradesh between latitudes 16° 18' 05" and 17° 28' 52" N and longitudes 80° 52' 04" and 81° 51' 31" E. Geographical area of the Division (and the District) is 7742 km<sup>2</sup>. The Division has two physiographic zones, the plains and the Hills. The climate of Eluru Division is characterized by high humidity nearly all the year round with oppressive summer and good seasonal rainfall. The major rivers falling in the Division are Godavari, Gauthami and Vasita.

Land use pattern of the Division is given in Table 4.12.1

**Table 4.12.1: Land use Pattern**

Land use	Area in km <sup>2</sup>	Percentage
Forest including Scrub	739.36	9.55
Agriculture	5591.9	72.23
Land with Scrub	58.92	0.75
Fallow Lands	40.77	0.53
Grasslands	0.00	0.00
Settlements	143.74	1.86
Vegetation outside forest	417.04	5.39
Water Bodies	750.27	9.69
<b>Total</b>	<b>7742.00</b>	

Deccan traps, Alluvial deposits, Lower or upper Gondwana sediments, Khondalites and Charcolites occupy the district. Loamy soils, Lateritic and black cotton soils are found in the District. Temperature ranges from 17°C to 45°C and the annual rainfall is about 1076mm. South West monsoon gives more rain than North East monsoon.

The population of the Division (District) is 3.93 million (2011 census), per capita forest 0.02 Ha and the population density is 508 per Km<sup>2</sup>.

### 4.12.2 Recorded Forest Area:

The notified forest area of the Division is **773.03 Km<sup>2</sup>** which is 10% of the geographical area. Reserved and Protected forests constitute 732.11 Km<sup>2</sup> (95%) and Km<sup>2</sup> 40.9(5%) of the forest area respectively.

As per the Champion and Seth's classification, the forest types found in the Division are Tropical Moist Mixed Deciduous Forests, Tropical Dry Deciduous Scrub Forests and Tropical Dry Evergreen Scrub Forests.

### 4.12.3 Protected Area:

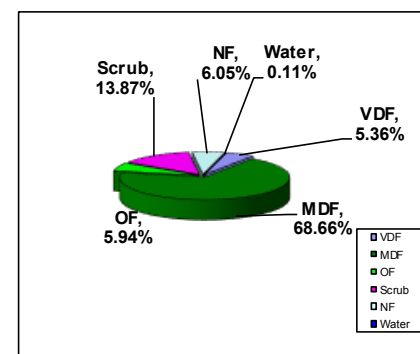
Two Protected Areas, viz., Kolleru and Papikonda Wild Life Sanctuaries fall partly in this Division. An area of 308.55 Km<sup>2</sup> is included in the Kolleru WLS which is the largest fresh water lake in the Country and also a Ramsar site. Papikonda Wild Life Sanctuary occupies 591 Km<sup>2</sup> of the forest area of the Division.

### 4.12.4 Community Forest Management:

There are 213 VSSs in the Division. An area of 414.54 Km<sup>2</sup> of forests, which constitutes 53% of 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 2012 data (Nov\ Dec 2012) is **572.23 Km<sup>2</sup>** which is 7.39% of the geographical area. In terms of the forest canopy cover density classes, the Division has **41.47 Km<sup>2</sup>** of very Dense Forests **530.76 Km<sup>2</sup>** of Moderately Dense Forests and **45.90 Km<sup>2</sup>** of Open Forests. The area of the Scrub is **107.25 Km<sup>2</sup>**, Non-Forest **46.78 Km<sup>2</sup>** and Water Bodies **0.86 Km<sup>2</sup>**. The distribution of the forest cover of the Division is shown in Fig 4.12.1.



**Fig 4.12.1**

#### 4.12.6 Change in Forest Cover:

The satellite images of 2011 and 2012 are shown in Figs 4.12.2 & 4.12.3 respectively and the changes between this period are shown on the image of 2012.

Comparison of the current forest cover with that of previous assessment year shows a **negative change of 423.54 Ha** and **positive change of 47.78 Ha**. The forest cover change matrix given in Table 4.12.2 reveals that there is a decrease of **94.68 Ha** of moderately dense forest and **281.08 Ha** of open forest.

The total positive change (including scrub) of **278.17 Ha** is on account of growth in raised plantations. The total negative change (including scrub) is **544.83 Ha**. Out of this, **392.29 Ha** is on account of clearance of jungle growth for raising of plantations, **47.33 Ha** is on account of harvesting of plantations and **105.21 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 the negative change due to encroachments alone is taken as loss of forest cover. Therefore, the **net loss of forest cover is 105.21 Ha** in the Division.

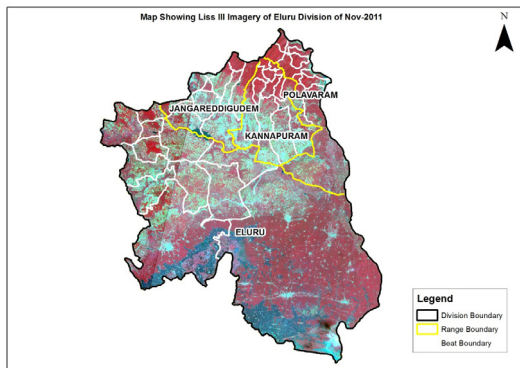


Fig 4.12.2

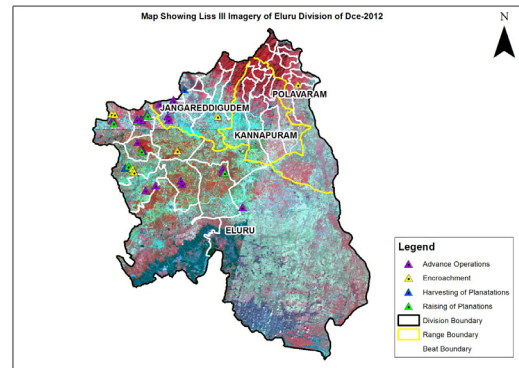
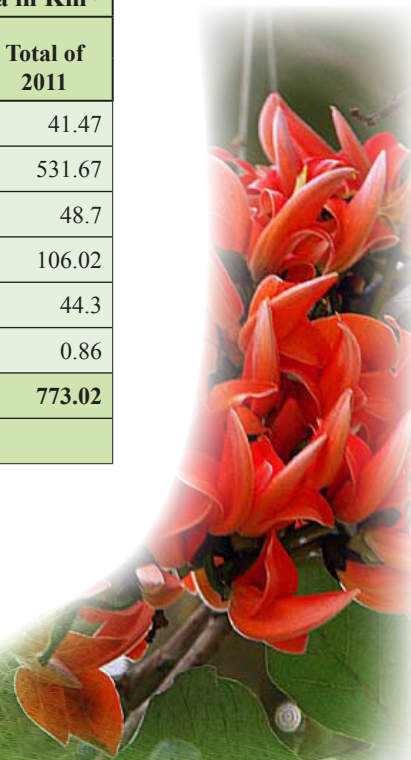


Fig 4.12.3

There are 43 Beats in the Division. Negative changes in forest cover are seen in 11 Beats and Positive changes in forest cover are seen in 3 Beats. There is no change in the remaining 29 Beats. Details of forest cover changes in these 14 Beats along with other remaining beats are shown in Table 4.12.3.

Table 4.12.2: Forest Cover change matrix							(Area in Km <sup>2</sup> )
2011	2012						Total of 2011
	VDF	MDF	OF	SF	NF	Water	
Very Dense Forest	41.47	0	0	0	0	0	41.47
Moderately Dense Forest	0	530.67	0	0.01	0.99	0	531.67
Open Forest	0	0	45.51	0.22	2.97	0	48.7
Scrub	0	0.09	0	104.72	1.21	0	106.02
Non-Forest	0	0	0.39	2.3	41.61	0	44.3
Water	0	0	0	0	0	0.86	0.86
<b>Total of 2012</b>	<b>41.47</b>	<b>530.76</b>	<b>45.9</b>	<b>107.25</b>	<b>46.78</b>	<b>0.86</b>	<b>773.02</b>
<b>Net Change</b>	<b>0</b>	<b>-0.91</b>	<b>-2.8</b>	<b>1.23</b>	<b>2.48</b>	<b>0</b>	





**Table 4.12.3: List of Beats showing Forest Cover with changes (Area in Ha)**

BEAT	VDF	MDF	OF	SF	NF	WB	Total	Ecroachment	Net change
<b>Eluru Range</b>									
A R Palem	0	674.039	292.472	588.01	138.291	0	1692.812	4.37	-4.37
Barrikonda	0	581.656	461.971	352.474	116.079	1.462	1513.642	32.59	-34.54
Bhogole	0	218.691	187.937	791.387	421.683	16.009	1635.707	0.00	-51.50
Chintalapudi	0	1936.831	140.287	142.084	77.799	0	2297.001	0.00	-10.05
Dubacherla	0	790.578	184.878	185.149	108.869	0	1269.474	0.00	-27.91
M.V.gudem	0	1559.892	368.158	423.064	154.991	0	2506.105	0.00	36.56
Nallajerla	0	594.094	212.855	655.7	102.003	0	1564.652	0.00	0.00
R.s.varam	0	512.134	397.879	398.51	72.161	0	1380.684	0.00	0.00
Thadike-lapudi	0	337.006	105.557	834.146	252.401	0	1529.11	0.00	-33.3
V.R.Gudem	0	72.071	57.063	540.677	494.886	48.3	1212.997	0.00	-19.52
Velagalapalli	0	43.887	142.873	1276.16	548.379	0	2011.299	22.89	28.19
Yerragun-tapalli	0	610.146	270.055	302.836	58.121	0	1241.158	0.00	42.83
<b>Total</b>	<b>0</b>	<b>7931.025</b>	<b>2821.99</b>	<b>6490.197</b>	<b>2545.663</b>	<b>65.771</b>	<b>19854.641</b>	<b>59.85</b>	<b>-73.61</b>
<b>Jangareddigudem Range</b>									
Aliveru	92.8	2922.324	1.178	6.203	2.445	0	3024.945	0.00	0.00
Ankanna-gudem	0	821.606	63.226	209.716	129.302	0	1223.85	0.00	0.00
Antarve-digudem	36.6	1450.129	1.699	79.378	34.629	0	1602.458	0.00	0.00
Dar-bhagudem	0	227.21	437.686	415.491	247.614	0	1328.001	0.00	-54.02
Doramamidi	5.84	778.616	6.328	90.71	5.992	0	887.483	0.00	0.00
Gullapudi	492	3604.518	8.526	71.409	19.989	3.58	4199.655	0.00	0.00
Jeelugumilli	0	593.993	508.945	317.089	87.371	0	1507.398	0.00	-37.66
Kamaiah-palem	0	718.589	466.277	602.986	295.967	0	2083.819	0.00	0.00
Marlagudem	0	132.512	69.658	374.433	246.948	0	823.551	43.97	-43.97
Mulagalampalli	0	341.945	63.152	1320.367	801.07	0	2526.534	0.00	0.00
<b>Total</b>	<b>627</b>	<b>11591.44</b>	<b>1626.68</b>	<b>3487.782</b>	<b>1871.327</b>	<b>3.58</b>	<b>19207.694</b>	<b>43.97</b>	<b>-135.65</b>
<b>Kannapuram range</b>									
Chinthapalli	120	1488.582	1.784	1.053	0	0	1611.532	0.00	0.00
Dandipudi	608	2741.32	10.334	66.367	99.241	0	3525.491	0.00	0.00
Kallumamidi	425	725.846	1.179	1.235	0	0	1152.947	0.00	0.00
Karakapadu	0	499.73	1.541	40.05	23.265	13.669	578.255	0.00	0.00

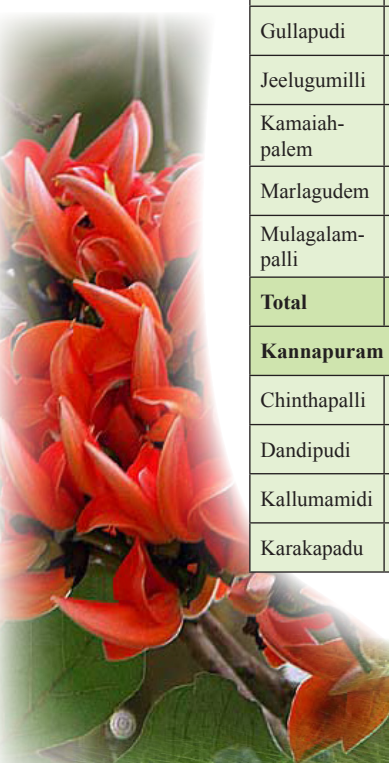


Table 4.12.3: List of Beats showing Forest Cover with changes								(Area in Ha)	
BEAT	VDF	MDF	OF	SF	NF	WB	Total	Ecroachment	Net change
Kopalli	93.6	2100.265	1.024	2.275	1.846	0	2198.986	0.00	0.00
Kotrupalli	46.5	961.733	2.022	2.812	0	0	1013.082	0.00	0.00
Kovvada	8.83	1134.716	20.949	286.875	72.005	0	1523.371	0.00	0.00
Kunkala	51.5	2266.036	6.091	60.711	3.354	0	2387.645	0.00	0.00
L n d pet	185	1802.08	39.327	67.369	2.954	0	2096.94	0.00	0.00
P R Gudem	317	2050.669	16.675	43.654	14.534	0	2442.129	0.00	0.00
<b>Total</b>	<b>1855</b>	<b>15770.98</b>	<b>100.926</b>	<b>572.401</b>	<b>217.199</b>	<b>13.669</b>	<b>18530.378</b>	<b>0.00</b>	<b>0.00</b>
<b>Polavaram Range</b>									
Chilakaluru	791	2184.541	0.499	36.706	7.915	0	3020.557	0.00	0.00
Kondrukota	315	3795.673	2.789	8.827	0	0	4122.234	0.00	0.00
Kothuru	6.06	659.34	2.536	2.464	1.11	0	671.506	0.00	0.00
Nettappa-kota	173	1807.087	0	5.564	0	0	1985.592	1.38	-1.38
Polavaram	12.3	1119.569	2.251	17.025	13.993	0	1165.138	0.00	0.00
Sirivaka	116	1716.314	21.699	67.401	12.725	3.314	1937.389	0.00	0.00
Sivagiri	0.62	1095.185	4.525	12.097	7.033	0	1119.457	0.00	0.00
Tekuru	0	1438.041	2.181	4.763	0.799	0	1445.784	0.00	0.00
Thutigunta	164	2108.884	0.506	6.88	1.518	0	2281.625	0.00	0.00
Udathapalli	86	671.665	0	0	0	0	757.698	0.00	0.00
Vinjaram	1.12	1184.791	2.474	13.788	0	0	1202.171	0.00	0.00
<b>Total</b>	<b>1665</b>	<b>17781.09</b>	<b>39.46</b>	<b>175.515</b>	<b>45.093</b>	<b>3.314</b>	<b>19709.151</b>	<b>1.38</b>	<b>0.00</b>
<b>Grand Total</b>	<b>4147</b>	<b>53074.53</b>	<b>4589.05</b>	<b>10725.9</b>	<b>4679.282</b>	<b>86.334</b>	<b>77301.864</b>	<b>105.20</b>	<b>-209.26</b>





## 4.13. KAKINADA DIVISION

### 4.13.1 Introduction:

Kakinada Forest Division comprises of the entire district of East Godavari and lies in the north eastern part of Andhra Pradesh between latitudes  $16^{\circ} 18' 04''$  and  $18^{\circ} 00' 54''$  N and longitudes  $81^{\circ} 30' 08''$  and  $82^{\circ} 36' 17''$  E. Geographical area of the Division is 10807 Km<sup>2</sup>. The Division can be broadly classified into 3 natural regions namely the Delta, upland and Agency or hill tracts. The general elevation of the district varies from a few meters near the sea-coast to about 300 M above MSL in the hills of the agency. The Eastern Ghats rise by gradations from the level of the coast and spread throughout the erstwhile agency Taluks of Rampachodavaram and Yellavaram. The delta portion constituting the whole of Konaseema and portions of erstwhile Taluks of Kakinada, Ramachandrapuram and Rajahmundry, presents a vast expanse of rice-fields surrounded by plantains, betel, coconut gardens and innumerable palmyrahs. The erstwhile Taluks of Tuni, Pithapuram, Peddapuram and portions of Kakinada, Ramachandrapuram and Rajahmundry constitute the upland areas. The main soils in the district are alluvial (clay loamy) red soil, sandy loam and sandy clay. There is mostly alluvial soil in Godavari delta and sandy clay soil at the tail end portions of river Godavari, red loamy soil in upland and agency area of the district. The major rivers falling in the Division are Godavari, Pampa and Yeleru.

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

The region mostly has a tropical climate like the rest of the Coastal Andhra region. The summers (March-June) are very hot and humid. The rainy season (July-Jan) is the best time to visit this place with the fields brilliantly green with paddy crops, rivulets flowing with water and the sun shining brightly but not burning as it does in the summer. Temperature ranging from 10°C to 48°C and the annual rainfall is about 1280 mm.

Population of the Division is 5.15 million (2011 Census), per capita forest is 0.06 Ha and the population density is 477 persons per Km<sup>2</sup>.

**Table 4.13.1: Land use Pattern**

Land use	Area in km <sup>2</sup>	Percentage
Forest including Scrub	2971.09	27.49
Agriculture	5574.51	51.58
Land with Scrub	331.78	3.07
Fallow Lands	224.00	2.07
Grasslands	22.00	0.2
Settlements	130.19	1.2
Vegetation outside forest	1149.41	10.64
Water Bodies	404.02	3.75
<b>Total</b>	<b>10807.00</b>	

### 4.13.2 Recorded Forest Area:

The notified forest area of the Division is **3235.39 Km<sup>2</sup>** which is 32.71% of the geographical area. Reserved and Protected Forests constitute 2701.31Km<sup>2</sup> (83.3%) and 531.13 Km<sup>2</sup> (22.7%) of the forest area respectively.

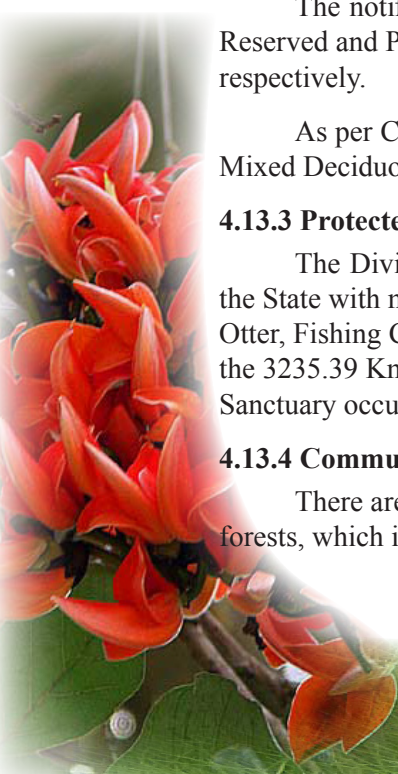
As per Champion and Seth's classification, the forest types found in the Division are Tropical Moist Mixed Deciduous Forests and Tropical Dry Deciduous Scrub Forests.

### 4.13.3 Protected Area:

The Division has Coringa Wild Life Sanctuary- the largest surviving patch of Mangrove forests in the State with more than 65 Mangrove tree species and a Home for the rare and endangered Smooth Indian Otter, Fishing Cat and Estuarine Crocodile; and a part of Papikonda Wild Life Sanctuary in its fold. Out of the 3235.39 Km<sup>2</sup> of forest area, the Coringa WLS occupies an area of 235.7 Km<sup>2</sup> and Papikonda Wild Life Sanctuary occupies 591 Km<sup>2</sup>.

### 4.13.4 Community Forest Management:

There are 529 Vana Samrakshana Samities (VSSs) in the Division with an area of 1148.05 Km<sup>2</sup> of forests, which is 35.4% of the forest area.



#### 4.13.5 Forest Cover:

The forest cover in the Division based on the interpretation of IRS R2 LISS III 2012 data (Data of Dec2012) is **2807.62 Km<sup>2</sup>** which is **25.97%** of the geographical area. In terms of the forest canopy density classes, the Division has **67.18 Km<sup>2</sup>** of Very Dense Forests, **1996.70 Km<sup>2</sup>** of Moderately Dense forests and **734.74 Km<sup>2</sup>** of Open Forests. The area of the Scrub is **30.89 Km<sup>2</sup>**, Non-Forest **244.03 Km<sup>2</sup>** and Water Bodies **152.85 Km<sup>2</sup>**. The distribution of the forest cover of the Division is shown in Fig 4.13.1.

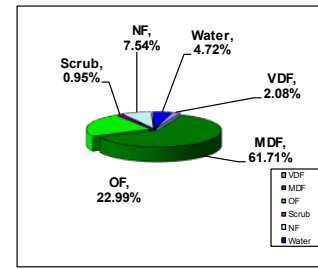


Fig 4.13.1

#### 4.13.6 Change in Forest Cover:

The satellite images of 2011 and 2012 seasons are shown in Fig 4.13.2 and Fig 4.13.3 respectively and the changes between this period are shown on the image of 2012.

Comparison of the current forest cover with that of previous assessment year shows a **negative change** in forest cover of **400.33 Ha** and a **positive change of 0 Ha**. The forest cover change matrix given in Table 4.13.2 reveals that there is a decrease of **376.66 Ha** of Moderately dense forest, **23.67 Ha** of Open forest .

The positive change (including scrub) is **52.03 Ha**. Of this, **40.69 Ha** is on account of growth in raised plantations, **11.34 Ha** is on account of evacuation of encroached land and consequent improvement in the greenness. The total negative change (including scrub) is **581.23 Ha**. Out of this, **347.22 Ha** is on account of clearance of jungle growth for raising of plantations, **108.94 Ha** is on account of harvesting of plantation, **1.79 Ha** is on account of diversion of forest lands for non-forestry purposes , **118.09 Ha** is on account of encroachments and **5.19 Ha** is on account of failure plantations. As clearance of jungle growth for raising of plantations, harvesting of plantations and diversion of forest lands are forest management interventions, the same are not considered as loss of forest cover. Thus the negative change due to encroachments alone is taken as loss of forest cover. Therefore, the **net loss of forest cover is 118.09 Ha** in the division.

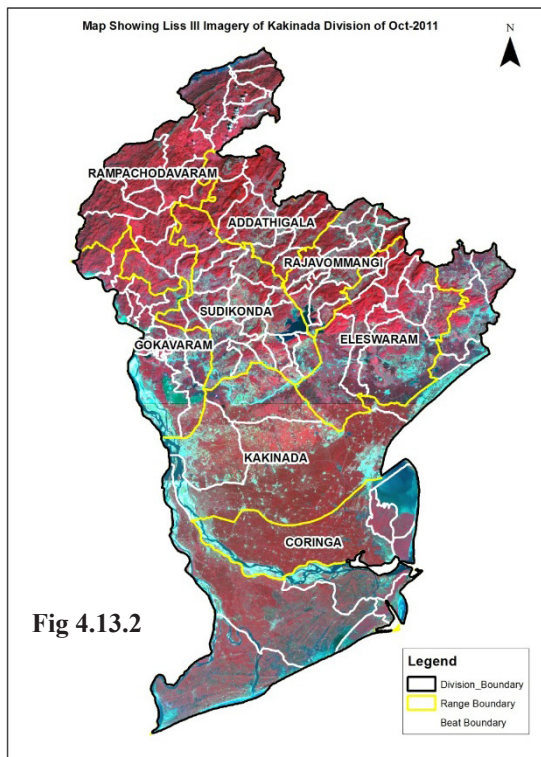


Fig 4.13.2

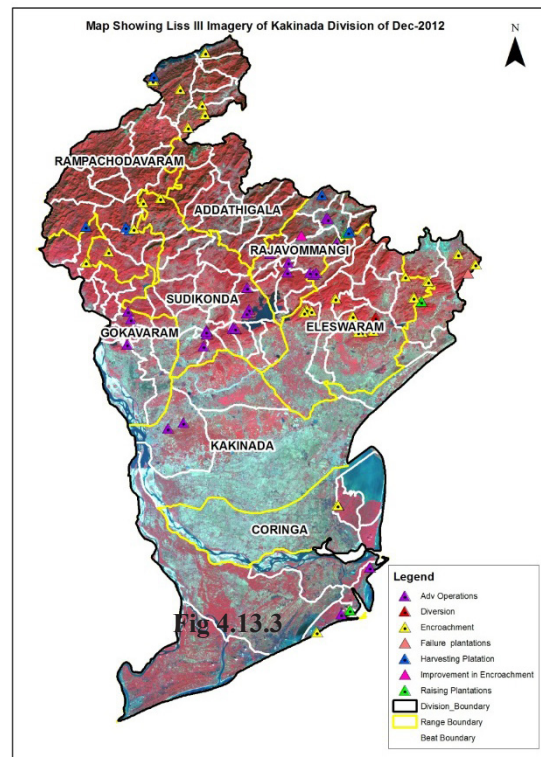


Fig 4.13.3

Fig 4.13.1

Fig 4.13.1

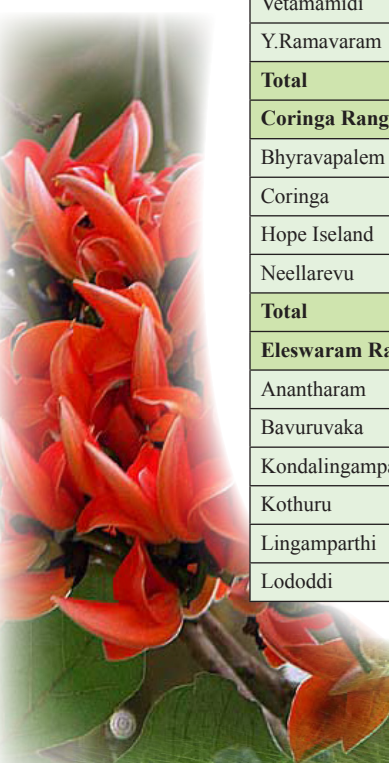




There are 99 Beats in the Division. positive changes in forest cover are seen only in 18 Beats and there are no changes in the remaining 81 Beats. Details of forest cover changes in the 38 Beats mentioned above are shown in Table 4.13.3.

Table 4.13.2: Forest Cover change matrix (Area in Km <sup>2</sup> )							
2011	2012						Total of 2011
	VDF	MDF	OF	Scrub	NF	Water	
Very Dense Forest	67.18	0	0	0	0	0	67.18
Moderately Dense Forest	0	1996.7	0.72	1.9	1.08	0	2000.4
Open Forest	0	0	743.02	0.29	0.66	0	743.97
Scrub	0	0	0	28.18	1.15	0	29.33
Non-Forest	0	0	0	0.52	241.14	0	241.66
Water	0	0	0	0	0	152.85	152.85
<b>Total of 2012</b>	<b>67.18</b>	<b>1996.7</b>	<b>743.74</b>	<b>30.89</b>	<b>244.03</b>	<b>152.85</b>	<b>3235.39</b>
Net Change	0	-3.7	-0.23	1.56	2.37	0	

Table 4.13.3: List of Beats showing Forest Cover with changes (Area in Ha)									
BEAT	VDF	MDF	OF	SF	NF	WB	Total	Net Change	Encroachment
<b>Addathigala Range</b>									
Addathigala	11.95	1310.29	295.20	2.63	61.76	3.35	1685.19	0.00	0.00
Chavitidibbalu	96.56	2510.25	346.52	16.26	192.92	0.00	3162.51	0.00	0.00
Dakodu	9.93	2540.49	334.15	8.96	128.35	0.00	3021.87	0.00	0.00
Dutcherthi	8.96	2461.83	505.59	13.74	66.83	0.00	3056.94	0.00	0.00
Kalimamidi	5.00	3186.64	663.53	9.97	231.86	0.00	4096.99	0.00	0.00
P.Yerragonda	232.76	6430.12	1313.76	58.59	298.81	0.00	8334.03	0.00	0.00
Perikivalasa	10.44	4382.49	1768.92	88.21	822.20	0.00	7072.25	0.00	0.00
Vedullakonda	3.87	865.62	470.54	5.89	159.61	0.00	1505.51	0.00	0.00
Vetamamidi	2.35	1314.14	508.35	6.32	48.74	0.06	1879.97	0.00	0.00
Y.Ramavaram	133.34	5592.76	1018.51	8.40	149.19	0.00	6902.19	0.00	0.00
<b>Total</b>	<b>515.15</b>	<b>30594.63</b>	<b>7225.05</b>	<b>218.96</b>	<b>2160.26</b>	<b>3.42</b>	<b>40717.46</b>	<b>0.00</b>	<b>0.00</b>
<b>Coringa Range</b>									
Bhyravapalem	0.51	2427.72	95.11	12.79	137.18	726.40	3399.70	0.00	0.00
Coringa	139.06	5431.15	266.70	15.57	54.47	447.96	6354.91	-0.62	0.62
Hope Iseland	0.29	2931.25	350.30	50.82	221.78	10686.90	14241.34	0.00	0.00
Neellarevu	0.01	-0.07	0.01	0.00	1.22	0.01	1.18	-1.10	1.10
<b>Total</b>	<b>139.87</b>	<b>10790.05</b>	<b>712.11</b>	<b>79.18</b>	<b>414.64</b>	<b>11861.27</b>	<b>23997.13</b>	<b>-1.72</b>	<b>1.72</b>
<b>Eleswaram Range</b>									
Anantharam	71.98	2235.78	167.31	1.01	66.86	0.00	2542.93	0.00	0.00
Bavuruvaka	417.13	1697.77	106.16	4.47	74.58	0.00	2300.10	0.00	0.00
Kondalingamparthi	26.42	1077.78	425.01	6.03	192.44	0.00	1727.68	0.00	0.00
Kothuru	81.53	2241.78	422.96	15.15	115.84	1.26	2878.52	-12.42	10.63
Lingamparthi	590.85	1379.91	53.42	1.41	81.98	0.00	2107.57	-15.89	15.89
Lododdi	193.28	1897.20	200.27	2.00	87.71	0.00	2380.47	0.00	0.00



Pedamallapuram	754.39	3596.65	202.59	2.72	52.77	0.00	4609.12	0.00	0.00
Peddipalem	1330.15	4271.55	246.80	1.93	108.85	2.63	5961.91	-9.74	9.74
Raghavapatnam	167.82	1188.05	227.45	4.16	63.37	0.00	1650.86	0.00	0.00
S.Agraharam	59.07	1383.74	540.15	20.23	247.95	0.00	2251.14	-8.88	8.88
Vatangi	92.60	1536.17	350.00	3.71	120.86	0.00	2103.33	0.00	0.00
<b>Total</b>	<b>3785.22</b>	<b>22506.37</b>	<b>2942.12</b>	<b>62.81</b>	<b>1213.21</b>	<b>3.90</b>	<b>30513.63</b>	<b>-46.93</b>	<b>45.14</b>
<b>Gokavaram Range</b>									
Angaluru	0.00	457.79	799.13	25.69	48.65	0.00	1331.26	0.00	0.00
Chinabarangi	0.00	674.84	714.58	15.14	262.99	0.00	1667.54	0.00	0.00
Dandangi North	0.00	657.85	337.16	5.33	16.84	0.00	1017.18	-4.85	0.00
Dandangi South	0.00	145.46	379.29	6.28	12.55	0.00	543.58	-10.55	0.00
Devaram	0.00	303.82	123.09	0.00	0.32	0.00	427.23	0.00	0.00
Devipatnam	0.00	563.92	506.72	3.74	18.13	0.00	1092.50	0.00	0.00
Indukurupeta	0.00	133.55	161.85	0.51	6.76	0.00	302.67	0.00	0.00
Katchuluru	8.98	971.81	351.05	0.68	18.28	0.00	1350.80	0.00	0.00
Kondamodalu	6.28	2553.43	2564.71	70.01	210.23	0.00	5404.65	0.00	0.00
Manturu	0.00	483.97	945.06	12.12	11.93	0.00	1453.08	0.00	0.00
Pedanuthula	2.00	1091.53	449.54	7.68	49.14	0.00	1599.89	0.00	0.00
Purushothapatnam	0.00	153.24	301.50	0.00	13.77	0.00	468.51	0.00	0.00
Sarabhavaram	0.00	355.41	198.21	5.56	18.82	0.00	577.99	-4.94	0.00
Teliperu	57.09	3498.24	957.73	31.33	84.63	0.00	4629.02	-5.30	5.30
Veeravaram	0.00	694.81	622.01	13.47	11.40	0.00	1341.69	0.00	0.00
<b>Total</b>	<b>74.35</b>	<b>12739.64</b>	<b>9411.62</b>	<b>197.54</b>	<b>784.43</b>	<b>0.00</b>	<b>23207.58</b>	<b>-25.64</b>	<b>5.30</b>
<b>Kakinada Range</b>									
Atchutapuram	1.85	821.43	931.77	46.81	362.26	0.00	2164.11	-8.38	3.19
Dewancheruvu	48.06	561.01	30.26	80.68	50.53	0.00	770.54	-80.41	0.00
Kandikuppa	0.00	6.79	3.04	0.00	0.00	0.00	9.83	0.00	0.00
Kandikuppa Plantation	0.00	2238.15	525.64	103.19	484.95	548.74	3900.66	-14.02	19.66
Masanitippa	89.98	1300.71	159.31	41.73	125.76	69.26	1786.76	-6.06	0.00
Murari	0.00	294.76	190.99	23.64	101.15	0.00	610.54	0.00	0.00
Rajupeta	33.88	2550.26	688.01	18.19	161.29	0.00	3451.62	4.70	0.69
Ratikalva	9.35	1028.48	98.39	25.89	235.27	618.78	2016.14	0.00	0.00
Sangavaka	43.75	852.95	291.00	16.07	98.88	0.00	1302.65	0.00	0.00
Vodalarevu	0.00	150.67	43.88	1.57	5.88	0.00	202.00	0.00	0.00
<b>Total</b>	<b>226.86</b>	<b>9805.19</b>	<b>2962.30</b>	<b>357.77</b>	<b>1625.96</b>	<b>1236.77</b>	<b>16214.85</b>	<b>-104.17</b>	<b>23.54</b>
<b>Rajavommangi Range</b>									
Badadanapalli	2.36	1193.06	319.09	2.45	821.18	0.00	2338.14	0.00	0.00
Doramamidi	3.36	2492.64	400.37	5.70	175.64	0.00	3077.70	-16.66	0.00
J.Annavaram	16.10	3255.33	446.42	10.96	325.89	1.40	4174.32	-59.11	0.00
Jaddangi	0.62	2369.86	921.84	58.22	915.11	0.00	4265.66	-54.44	10.34
Labbarthi	0.00	2664.74	943.08	26.31	576.78	0.00	4210.92	11.34	0.00
Lagarai	0.00	536.90	260.34	2.20	218.49	0.00	1017.93	-28.44	0.00
Laxmipuram	20.04	983.34	177.86	5.63	78.38	0.00	1265.24	0.00	0.00
Rajavommangi	0.00	1021.27	804.43	49.28	1361.87	17.68	3254.52	0.52	0.00
Thimmapuram	20.33	1160.79	468.22	6.97	436.20	0.00	2092.49	-19.44	0.00





Vayyada	266.22	1727.23	313.58	5.66	198.83	0.00	2511.51	-36.51	0.00
Veerabhadrapuram	37.40	1228.65	255.91	3.37	90.58	0.00	1615.91	0.00	0.00
<b>Total</b>	<b>366.41</b>	<b>18633.81</b>	<b>5311.13</b>	<b>176.75</b>	<b>5198.95</b>	<b>19.07</b>	<b>29824.34</b>	<b>-202.74</b>	<b>10.34</b>
<b>Rampachodavaram Range</b>									
Akumamidikota	354.57	9155.61	2260.10	80.37	849.18	0.00	12699.82	0.00	0.00
Chintalapudi	9.90	2329.55	471.68	15.70	120.22	0.00	2947.05	0.00	0.00
Daragadda	40.21	1022.02	982.23	37.16	388.70	0.00	2470.33	-5.95	5.95
Devarapalli	35.74	5883.77	1742.26	52.28	330.85	19.64	8064.53	-3.60	2.51
Donkarai	52.41	2405.87	6323.58	633.87	1502.46	820.84	11739.03	-8.92	7.31
Geddada	89.08	5346.20	2504.91	183.65	1589.19	2.58	9715.62	-3.03	3.03
Gurthedu	10.12	1155.66	1056.25	26.57	799.82	18.25	3066.66	-2.27	2.27
Kakuru	103.82	7719.84	1819.64	9.65	236.49	0.00	9889.44	0.00	0.00
Kutrawada	95.61	11118.01	5142.72	105.58	816.70	0.00	17278.61	0.00	0.00
Mangampadu	0.00	700.43	2547.21	146.28	666.92	366.69	4427.53	-1.00	1.00
Maredumilli North	1.40	3388.67	739.74	0.61	59.81	0.00	4190.22	0.00	0.00
Maredumilli South	155.39	6221.99	1357.71	15.57	61.61	0.00	7812.27	-10.46	0.00
Palagondi	0.00	1556.83	1178.83	56.02	502.17	8.56	3302.40	0.00	0.00
Pindukuruvayasa	12.19	5027.82	4205.44	134.14	580.90	0.00	9960.49	-15.30	0.00
Rampa	31.26	742.36	260.31	11.39	46.78	0.00	1092.10	0.00	0.00
Tanganakota	0.00	2352.81	2567.27	85.33	432.84	0.00	5438.24	0.00	0.00
Valamuru	125.58	6981.36	3062.82	58.57	300.16	0.00	10528.48	0.00	0.00
<b>Total</b>	<b>1117.27</b>	<b>73108.79</b>	<b>38222.68</b>	<b>1652.71</b>	<b>9284.80</b>	<b>1236.55</b>	<b>124622.79</b>	<b>-50.53</b>	<b>22.07</b>
<b>Sudikonda Range</b>									
Appanapalem	24.92	267.28	40.38	0.42	32.56	41.35	406.90	0.00	0.00
Beerampalli	5.72	1427.82	351.28	3.92	24.33	0.00	1813.08	0.00	0.00
Bhavaram	1.12	340.56	45.46	0.67	104.63	394.66	887.10	0.00	0.00
Bhimavaram	52.06	1740.41	305.37	4.53	23.45	0.00	2125.82	0.00	0.00
Burugubanda	0.00	876.09	381.75	4.60	70.17	0.00	1332.60	0.00	0.00
D.Velamalakota	276.26	5807.19	2139.72	132.63	631.57	0.00	8987.37	-9.98	9.98
Korumilli	34.53	1006.63	358.18	9.33	43.56	0.00	1452.23	0.00	0.00
Mallavaram East	6.15	522.89	226.29	38.52	182.58	124.91	1101.35	-34.90	0.00
Mallvaram West	2.01	454.50	133.79	4.36	54.03	0.00	648.68	0.00	0.00
Matlapadu	25.63	949.91	158.23	11.27	160.27	3.91	1309.21	-8.87	0.00
Molleru	0.00	1854.09	773.40	9.02	543.99	346.37	3526.88	-13.71	0.00
Narasapuram	0.00	693.60	442.50	17.66	186.22	13.50	1353.48	0.00	0.00
Pidathamamidi	22.83	1937.62	707.39	45.87	968.20	0.00	3681.90	0.00	0.00
Pinjarikonda	39.36	1557.56	247.27	5.56	58.96	0.00	1908.72	0.00	0.00
R Yerrampalem	0.00	444.44	333.42	3.45	102.75	0.00	884.06	-14.02	0.00
Sudikonda North	1.96	706.40	273.92	12.65	294.33	0.00	1289.26	0.00	0.00
Sudikonda South	0.00	336.42	173.94	12.98	89.44	0.00	612.77	-6.58	0.00
Tirumalayapalem	0.00	566.98	374.28	23.57	155.46	0.00	1120.27	-9.41	0.00
<b>Total</b>	<b>492.56</b>	<b>21490.37</b>	<b>7466.56</b>	<b>341.00</b>	<b>3726.51</b>	<b>924.69</b>	<b>34441.69</b>	<b>-97.47</b>	<b>9.98</b>
<b>Grand Total</b>	<b>6717.69</b>	<b>199668.85</b>	<b>74253.57</b>	<b>3086.71</b>	<b>24408.76</b>	<b>15285.66</b>	<b>323539.46</b>	<b>-529.20</b>	<b>118.09</b>



## 4.14 KRISHNA DIVISION

### 4.14.1 Introduction:

Krishna Forest Division comprises of the entire Krishna district that lies in the North eastern part of Andhra Pradesh between latitudes 15°42' 19" and 17°9' 10" N and longitudes 80°00'07" and 81°33' 13"E. Geographical area of the Division is 8,727 km<sup>2</sup>. The Division has 2 physiographic zones- the plains and the hills. The major rivers falling in the division are Krishna, Keesara, Tammileru and Budameru.

Land use pattern of the Division is given in Table 4.14.1

The temperature varies from 17°C in December to 45°C in the summer and the average annual rainfall is 1028 mm.

Deccan traps, alluvial deposits, lower or upper Gondwana sediments, khondalites and chalcrites occupy the districts. Soils found in the Division are loamy, lateritic and black cotton. Population of the Division is 4.52 million (2011 Census), per capita forest is 0.01 Ha and the population density is 519 per Km<sup>2</sup>.

### 4.14.2 Recorded Forest Area:

The notified forest area of the Division is **644.52 Km<sup>2</sup>**, which is 7.3% of the geographical area. Reserved and Protected Forests constitute an area of 417.44 Km<sup>2</sup> (65%) and 227.07 Km<sup>2</sup> (35%) of the forest area respectively.

As per Champion and Seth's classification, the forests of this Division can be classified as Dry Deciduous Scrub Forests, Tropical Thorn Forest, Tropical Evergreen scrub Forest and Tropical Tidal Swamp Mangrove Forests.

### 4.14.3 Protected Area:

Two Protected Areas, viz., Kolleru and Krishna Wild Life Sanctuaries fall in the Division. An area of 308.55 Km<sup>2</sup> of forest area of this Division forms a part of Kolleru WLS and 194.81 Km<sup>2</sup> of Krishna WLS.

### 4.14.4 Community Forest Management:

There are 68 Vana Samrakshana Samithies (VSSs) in the Division. An area of 624.80 Km<sup>2</sup> forests, which constitutes 96.8% of forest area, is under the management of the VSSs.

### 4.14.5 Forest Cover:

The forest cover in the Division based on the interpretation of IRS R2 LISS III 2012 data (Nov2013) is **372.64 Km<sup>2</sup>** which is **4.26%** of the geographical area. In terms of the forest canopy density classes, the Division has **2.99 Km<sup>2</sup>** of Moderately Dense Forests and **369.65 Km<sup>2</sup>** of Open Forests. The area of the Scrub is **172.76 Km<sup>2</sup>**, Non-Forest **47.27 Km<sup>2</sup>** and Water Bodies **51.85 Km<sup>2</sup>**. The distribution of the forest cover of the Division is shown in Fig 4.14.1

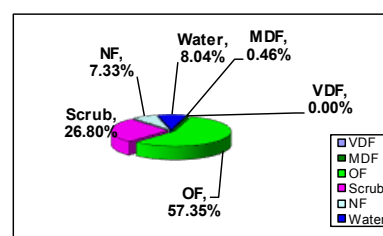
### 4.14.6 Change in Forest Cover:

The satellite images of 2011 and 2012 seasons are shown in Figs 4.14.2 & 4.14.3 respectively and the changes between this period are shown on the image of 2012.

Comparison of the current forest cover with that of previous assessment year shows a negative change of **68.85 Ha**. The forest cover change matrix of given in Table 4.14.2 reveals that there is a decrease of **68.85 Ha** of open forest.

**Table 4.14.1: Land use Pattern**

Land use	Area in km <sup>2</sup>	Percentage
Forest including Scrub	504.73	5.78
Agriculture	6089.71	69.78
Land with Scrub	137.42	1.57
Fallow Lands	528.28	6.05
Grasslands	0.00	0.00
Settlements	252.16	2.89
Vegetation outside Forest	386.23	4.43
Water Bodies	828.47	9.50
<b>Total</b>	<b>8727.00</b>	



**Fig 4.14.1**



The positive change (including scrub) is **64.94 Ha**. Out of this, **61.54 Ha** increase is on account of growth in raised plantations and **3.40 Ha** is on account of improved forest cover in encroachments. The total negative change (including scrub) is **179.92 Ha**. Out of this, **137.14 Ha** is on account of clearance of jungle growth for raising of plantations, **20.28 Ha** is on account of diversion of forest lands for non-forestry purposes and **22.50 Ha** is on account of encroachments. Thus the negative change due to encroachments alone is taken as loss of forest cover. Therefore, the **net loss of forest cover is 22.5 Ha** in the Division.

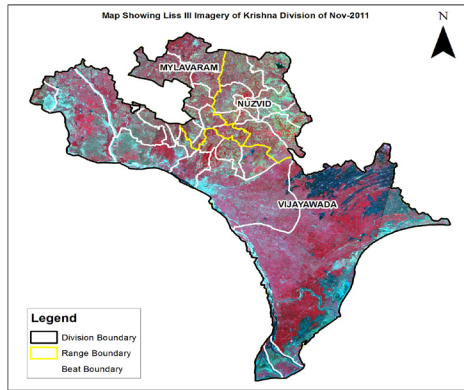


Fig 4.14.2

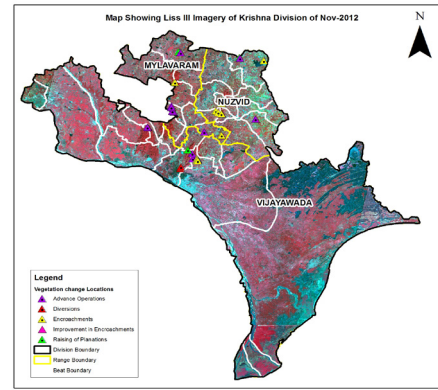


Fig 4.14.3

There are 34 Beats in the Division. Positive changes in forest cover are noticed in 6 Beats. There are no changes in the remaining 28 Beats. Details of forest cover changes in these 6 Beats are shown in Table 4.14.3.

2011	2012						Total of 2011
	VDF	MDF	OF	Scrub	NF	WB	
Very Dense Forest	0	0	0	0	0	0	0
Moderately Dense Forest	0	2.99	0	0	0	0	2.99
Open Forest	0	0	369.65	0.45	0.24	0	370.34
Scrub	0	0	0	171.66	1.11	0	172.77
Non-Forest	0	0	0	0.65	45.92	0	46.57
Water	0	0	0	0	0	51.85	51.85
<b>Total of 2012</b>	0	2.99	369.65	172.76	47.27	51.85	644.52
Net Change	0	0	-0.69	-0.01	0.7	0	

BEAT	MDF	OF	SF	NF	WB	Total	Net change	Encroachment
<b>Mylavaram Range</b>								
A,Konduru	0.00	1,440.93	359.62	12.70	0.00	1,813.24	0.00	0.00
Chandragudem	0.00	337.50	514.25	68.76	0.00	920.51	-63.37	0.00
Cheemalapadu	0.00	1,015.12	817.87	51.84	0.00	1,884.83	0.00	0.00
Kakarla	0.00	216.04	416.12	15.00	0.00	647.16	19.07	0.00
Pondugula	0.00	1,229.21	410.09	1.22	0.00	1,640.52	0.00	0.00
T.gannavaram	4.49	693.56	160.61	13.17	0.00	871.83	-13.17	2.28

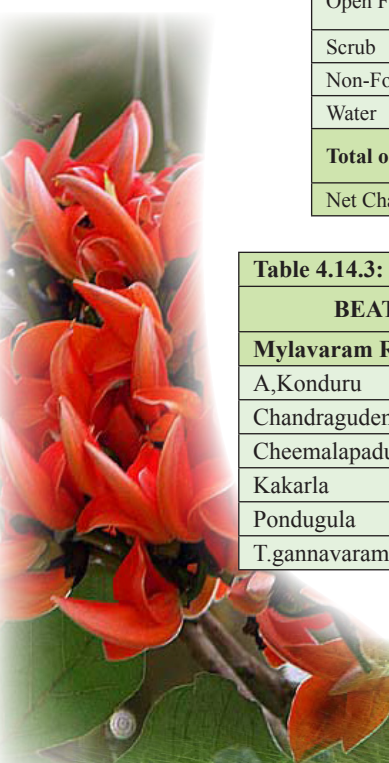


Table 4.14.3: List of Beats showing Forest Cover with changes.							(Area in Ha)	
BEAT	MDF	OF	SF	NF	WB	Total	Net change	Encroachment
Velvadam	0.00	190.64	591.58	11.06	0.00	793.27	0.00	0.00
Vinagadapa	0.00	1,275.07	260.47	0.63	0.00	1,536.17	-3.52	3.52
<b>Total</b>	<b>4.49</b>	<b>6,403.92</b>	<b>3,582.23</b>	<b>116.90</b>	<b>0.00</b>	<b>10,107.54</b>	<b>-60.99</b>	<b>5.80</b>
<b>Nuzvid Range</b>								
Anneraopeta	20.29	1,213.76	134.58	1.63	0.00	1,370.26	-1.63	1.63
Chillaboinapalli	0.00	566.75	125.10	67.84	1.10	760.78	0.00	0.00
Chinnampeta	0.00	627.45	1,199.16	171.09	116.25	2,113.95	-1.35	3.27
Chittapur	0.00	604.34	343.80	1.75	0.00	949.89	0.00	0.00
Kanimerla	2.00	1,024.76	471.19	1.92	0.00	1,489.08	-6.74	6.74
Katrenupadu	22.53	908.10	657.21	130.38	0.00	1,718.85	-10.07	0.00
Ramanakkapeta	0.00	401.40	314.77	33.61	0.00	749.78	0.00	0.00
Reddigudem	48.23	888.71	437.41	5.02	0.00	1,379.38	0.00	0.00
Sunkollu	18.01	1,143.79	260.51	2.31	1.12	1,425.70	-2.17	2.17
Yenamadala	0.73	455.49	43.81	0.00	0.00	500.03	0.00	0.00
<b>Total</b>	<b>111.79</b>	<b>7,837.53</b>	<b>3,989.60</b>	<b>400.32</b>	<b>118.47</b>	<b>12,457.70</b>	<b>-21.96</b>	<b>13.81</b>
<b>Vijayawada Range</b>								
Duggiralapadu	0.00	1,500.27	190.22	3.39	0.00	1,693.89	0.00	0.00
Elichetladibba	0.00	802.38	1,158.87	625.25	2,685.00	5,271.50	0.00	0.00
Gandrai	0.00	492.93	1,594.76	67.95	25.80	2,181.43	0.00	0.00
Gangineni	0.00	1,154.41	144.15	0.00	0.00	1,298.56	0.00	0.00
Jaggiahpetta	0.00	2.52	1,051.88	747.71	48.45	1,850.56	0.00	0.00
Jujuru	3.32	2,918.89	517.67	8.53	0.00	3,448.42	-5.79	0.00
Koduru	22.20	1,468.13	163.92	41.06	0.00	1,695.30	19.85	0.00
Kondapalli	0.00	870.09	304.11	0.00	0.00	1,174.19	0.00	0.00
Kothurutadepalli	127.86	2,064.54	199.81	8.41	0.00	2,400.63	-33.03	0.00
Metlapalli	0.00	338.65	119.49	0.00	0.00	458.15	0.00	0.00
Mulapadu	25.82	5,089.73	358.69	17.30	10.06	5,501.58	0.00	0.00
Nachugunta	0.00	2,823.77	1,940.40	1,338.29	1,304.17	7,406.63	0.00	0.00
Nunna	3.71	1,058.01	47.30	13.06	0.00	1,108.14	-13.06	2.89
Sobhanapuram	0.00	948.69	50.60	0.00	0.00	999.30	0.00	0.00
Sorlagondi	0.00	1,224.30	1,875.22	1,305.64	993.22	5,398.38	0.00	0.00
<b>Total</b>	<b>182.90</b>	<b>22,792.56</b>	<b>9,705.15</b>	<b>4,139.34</b>	<b>5,066.70</b>	<b>41,886.65</b>	<b>-32.03</b>	<b>2.89</b>
<b>Grand Total</b>	<b>299.17</b>	<b>37,034.01</b>	<b>17,276.97</b>	<b>4,656.56</b>	<b>5,185.16</b>	<b>64,451.88</b>	<b>-114.98</b>	<b>22.50</b>





## 4.15. NARSIPATNAM DIVISION

### 4.15.1 Introduction:

Narsipatnam Forest Division lies in the north-eastern part of Andhra Pradesh between latitudes 17° 27' 33" and 18° 07' 02" N and longitudes 81° 51' 47" and 82° 47' 59" E. Geographical area of the Division is 3754.99 Km<sup>2</sup> which is 30.95% of the geographical area of the district. The Division has two physiographic zones- the plains and the hills. Climate of the Division is characterized by high humidity nearly all round the year with oppressive summer and good seasonal rainfall. The climate of the hill parts of the district is different from that of the plain. Altitude varies from 130 M to 1529 M above MSL. The major rivers falling in the Division are Sileru- a tributary of Godavari, Varaha and Thandava which drain into Bay of Bengal.

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

The climate of the Division is characterized by three distinct seasons. i) Summer (ii) Rainy and (iii) Winter seasons. The temperature ranges from 5° C to 45° C and annual rainfall is about 712mm, received mainly from Southwest monsoons.

The Divisions geology comprises of oldest formation of charnokite series and predominant khondalite group of rocks of Precambrian age. The rocks are essentially Khondalite group with a few charnokite, bands, granites, quartzites, calcigranulites and pegmatites. The chief mineral found is bauxite in all the high hills of the agency area; wherever grasslands exist. There are 3 soil types in the Division - sandy soils of khondalites and quartzites, clayey sands of charnokites and granites and coastal sand dunes of quartzites.

Population of the Division is 0.51 million (2011 Census), per capita forest is 0.46 Ha and the population density is 121 persons per Km<sup>2</sup>.

**Table 4.15.1: Land use Pattern**

Land use	Area in Km <sup>2</sup>	Percentage
Forest including Scrub	2119.19	56.44
Agriculture	918.52	24.46
Land with Scrub	249.05	6.63
Fallow Lands	22.23	0.59
Grasslands	0.13	0
Settlements	8.5	0.23
Vegetation outside Forest	381.07	10.15
Water bodies	56.3	1.5
<b>Total</b>	<b>3755.00</b>	

### 4.15.2 Recorded Forest Area.

The Notified forest area of the Division is **2353.72 Km<sup>2</sup>** which is 62.67% of the geographical area. Reserved, Protected and un-classed forests constitute 989.92 Km<sup>2</sup> (42.12%), 1356.31 Km<sup>2</sup> (57.71%) and 4.05 Km<sup>2</sup> (0.17%) of the forest area respectively.

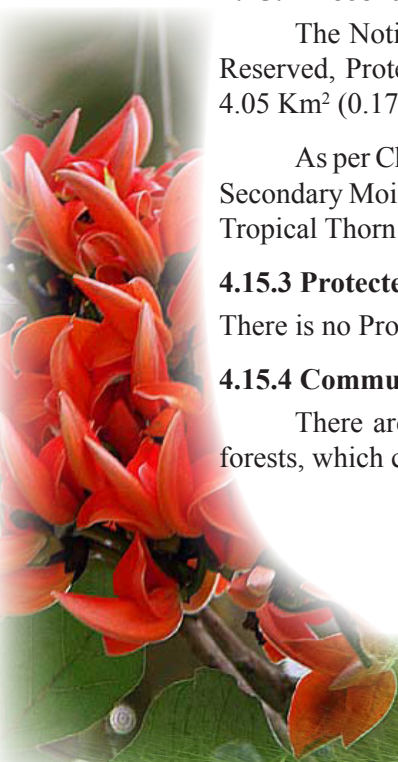
As per Champion and Seth's classification, the Division has Tropical Semi Evergreen Forests, Tropical Secondary Moist Mixed Deciduous Forests, Tropical Dry Deciduous Forests, Tropical Dry Evergreen Scrub, Tropical Thorn Forests and Dry Savanna Forests.

### 4.15.3 Protected Area:

There is no Protected Area in this Division.

### 4.15.4 Community Forest Management:

There are 284 Vana Samrakshana Samities (VSSs) in the Division with an area of 231.13 Km<sup>2</sup> of forests, which constitutes 9.8% of the forest area.



#### 4.15.5 Forest Cover:

The forest cover in the Division based on the interpretation of IRS R2 LISS III 2012 (Data of Oct/Dec 2012) is **1941.88 Km<sup>2</sup>** which is **51.71 %** of the geographical area. In terms of the forest canopy density classes the Division has **98.15 Km<sup>2</sup>** of Very Dense Forests, **1564.66 Km<sup>2</sup>** of Moderately Dense Forests and **279.07 Km<sup>2</sup>** of Open Forests. The area under Scrub is **121.96 Km<sup>2</sup>**, Non-Forest **289.36 Km<sup>2</sup>** and Water Bodies **0.55 Km<sup>2</sup>**. The distribution of the forest cover of the Division is shown in Fig 4.15.1.

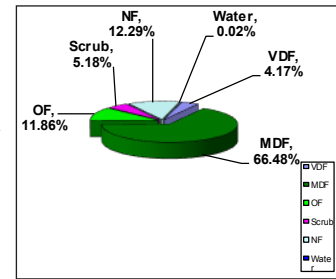


Fig 4.15.1

#### 4.15.6 Change in Forest Cover:

The satellite image of 2011 and 2012 seasons are shown in Figs. 4.15.2 and Fig 4.15.3 respectively and the changes between this periods are shown on the image of 2012.

Comparison of the current forest cover with that of previous assessment year shows a **negative change in forest cover of 5.64 Ha** and a **positive change in the forest cover of 18.94 Ha**. The forest cover change matrix given in Table 4.15.2 reveals that there is an increase of **13.30 Ha** of open forest and decrease of **39.56 Ha** of scrub.

The total positive change (including scrub) is **21.31 Ha**. Out of this, **1.24 Ha** is on the account of improvement of encroachment, **16.74 Ha** is on account of improvement of forest due to protection and management intervention and **3.33 Ha** is on account of growth of raised plantations. The total negative change (including scrub) is **29.62 Ha**. Out of this **7.16 Ha** is on account of clearance of jungle growth for raising of plantations and **22.46 Ha** is on account of encroachments. As raising of plantations is a forest management intervention, the same is not considered as loss of forest cover. Thus the negative change due to encroachments only is taken as loss of forest cover. Therefore, the **net loss of forest cover is 22.46 Ha** in the Division.

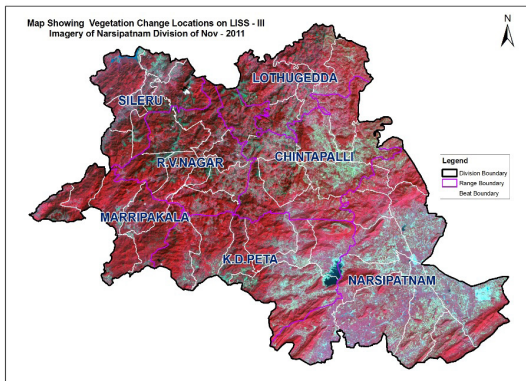


Fig 4.15.2

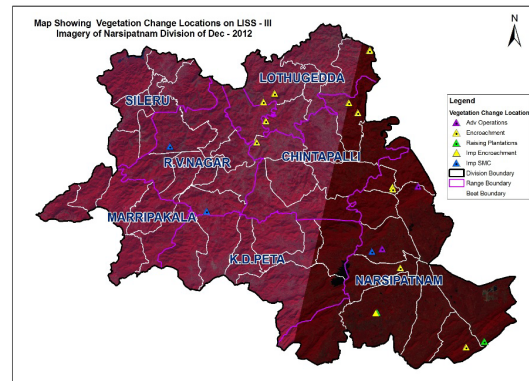


Fig 4.15.3

There are **52 Beats** in the Division. Negative changes in forest cover are noticed in 8 Beats and Positive changes in forest cover are noticed in 6 Beats. There are no changes in the remaining 38 Beats.

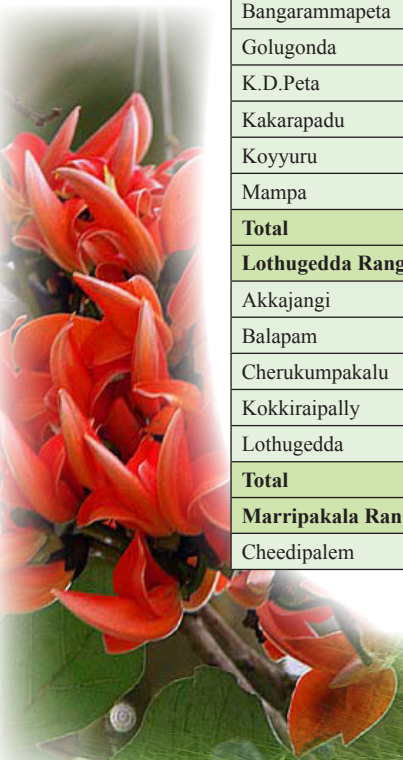
Details of forest cover changes in the 14 Beats along with other Beats mentioned above are shown in **Table 4.15.3**.





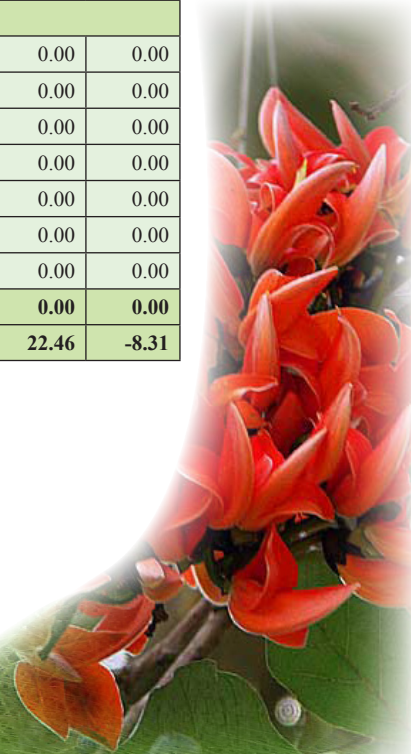
Table 4.15.2: Forest Cover change matrix (Area in Km <sup>2</sup> )							
2011	2012						Total of 2011
	VDF	MDF	OF	Scrub	NF	Water	
Very Dense Forest	98.15	0.00	0.00	0.00	0.00	0.00	<b>98.15</b>
Moderately Dense Forest	0.00	1564.66	0.00	0.00	0.00	0.00	<b>1564.66</b>
Open Forest	0.00	0.00	278.88	0.01	0.05	0.00	<b>278.94</b>
Scrub	0.00	0.00	0.19	121.93	0.24	0.00	<b>122.36</b>
Non-Forest	0.00	0.00	0.00	0.02	289.07	0.00	<b>289.09</b>
Water	0.00	0.00	0.00	0.00	0.00	0.55	<b>0.55</b>
<b>Total of 2012</b>	<b>98.15</b>	<b>1564.66</b>	<b>279.07</b>	<b>121.96</b>	<b>289.36</b>	<b>0.55</b>	<b>2353.75</b>
Net Change	0.00	0.00	0.13	-0.40	0.27	0.00	

Table 4.15.3: List of Beats showing Forest Cover with changes (Area in Ha)									
BEAT	VDF	MDF	OF	SCRUB	NF	WB	Total	Encroa- -chment	Net Change
<b>Chintapalli Range</b>									
Chintapalli_North	2.882	1180.208	578.751	498.313	1747.877	0	4008.031	1.86	-1.86
Chintapalli_South	123.091	3439.778	434.469	261.983	918.169	0	5177.49	0.00	0.00
Jerrela	14.143	3325.435	542.646	179.953	701.002	0	4763.179	0.00	0.00
Krishnapuram	67.297	3309.167	673.278	331.594	764.508	0	5145.844	5.84	-5.84
Lammasingi_North	57.861	2483.132	427.637	245.316	622.723	0	3836.669	0.00	0.00
Sarabhannapalem	488.486	7262.197	556.263	298.764	736.471	0	9342.181	0.00	0.00
Tajangi	18.159	1358.269	623.023	430.008	1037.036	0	3466.495	0.00	0.00
Wangasara	29.312	3326.407	644.217	524.678	1919.326	0	6443.94	0.00	0.00
<b>Total</b>	<b>801.231</b>	<b>25684.59</b>	<b>4480.284</b>	<b>2770.609</b>	<b>8447.112</b>	<b>0</b>	<b>42183.83</b>	<b>7.70</b>	<b>-7.70</b>
<b>K.d.peta Range</b>									
Balaram	358.989	4375.36	498.424	141.535	452.534	0	5826.842	0.00	0.00
Bangarammapeta	496.12	4389.463	90.433	54.763	143.767	0	5174.546	0.00	0.00
Golugonda	1232.632	2608.998	175.477	152.517	387.989	0	4557.613	0.00	0.00
K.D.Peta	96.739	1641.584	85.706	15.96	46.303	0	1886.292	0.00	0.00
Kakarapadu	81.261	2885.23	151.887	49.68	121.54	3.361	3292.959	0.00	0.00
Koyyuru	432.461	5217.205	330.796	147.714	265.794	0	6393.97	0.00	0.00
Mampa	477.216	5298.521	310.667	141.989	277.145	0	6505.538	0.00	0.00
<b>Total</b>	<b>3175.418</b>	<b>26416.36</b>	<b>1643.39</b>	<b>704.158</b>	<b>1695.072</b>	<b>3.361</b>	<b>33637.76</b>	<b>0.00</b>	<b>0.00</b>
<b>Lothugedda Range</b>									
Akkajangi	74.483	2373.772	685.434	482.744	827.257	0	4443.69	0.00	0.00
Balapam	241.398	7134.453	991.298	398.886	1560.406	0	10326.44	2.89	-2.89
Cherukumpakalu	14.54	2264.27	375.078	181.24	354.892	0	3190.02	1.60	-1.60
Kokkirapally	21.616	2392.835	689.674	295.225	612.612	0	4011.962	2.46	-2.46
Lothugedda	0	794.121	272.406	169.141	445.611	0	1681.279	0.00	0.00
<b>Total</b>	<b>352.037</b>	<b>14959.45</b>	<b>3013.89</b>	<b>1527.236</b>	<b>3800.778</b>	<b>0</b>	<b>23653.39</b>	<b>6.95</b>	<b>-6.95</b>
<b>Marripakala Range</b>									
Cheedipalem	59.797	3937.963	75.927	23.178	96.271	0	4193.136	0.00	0.00



**Table 4.15.3: List of Beats showing Forest Cover with changes (Area in Ha)**

BEAT	VDF	MDF	OF	SCRUB	NF	WB	Total	Encroa- -chment	Net Change
Doddavaram	171.783	5391.198	270.316	104.967	380.215	0	6318.479	0.00	0.00
M.Bheevaram	206.751	3212.431	289.093	31.363	38.327	0	3777.965	0.00	0.00
Marripakala	42.741	4922.086	565.088	120.208	319.299	0	5969.422	0.00	0.00
Palakajeedi	593.095	5448.82	263.661	135.659	420.437	0	6861.672	0.00	0.00
Valugudem	75.067	2886.446	572.732	297.298	411.769	0	4243.312	0.00	0.00
<b>Total</b>	<b>1149.234</b>	<b>25798.94</b>	<b>2036.817</b>	<b>712.673</b>	<b>1666.318</b>	<b>0</b>	<b>31363.99</b>	<b>0.00</b>	<b>0.00</b>
<b>Narsipatnam Range</b>									
Arlova	113.501	1183.987	285.393	152.909	699.919	0	2435.709	0.00	7.09
Downuru	704.804	2877.118	94.957	56.544	67.986	0	3801.409	0.00	0.00
K.V.Puram	0.368	602.396	682.024	481.637	302.024	0	2068.449	0.00	0.00
Koduru	28.451	1595.765	1443.177	217.628	4.95	0.477	3290.448	0.00	0.96
Kondasantha	486.497	1802.999	78.629	31.465	54.422	0	2454.012	0.00	-2.36
Kotavuratla	6.933	1106.214	1643.54	798.934	54.377	0	3609.998	2.17	-2.17
Lammasingi_South	156.515	1859.299	204.468	97.442	244.182	0	2561.906	1.01	0.23
Narsipatnam	347.97	1972.202	367.33	259.56	1070.603	1.349	4019.014	4.63	-4.63
Pedimikonda	66.798	1300.418	596.916	361.304	569.625	0	2895.061	0.00	2.37
Thadiparthi	288.929	3849.568	500.615	310.235	745.219	0	5694.566	0.00	0.00
Vedurupalli	867.351	2540.29	119.668	27.408	74.853	0	3629.57	0.00	0.00
<b>Total</b>	<b>3068.117</b>	<b>20690.26</b>	<b>6016.717</b>	<b>2795.066</b>	<b>3888.16</b>	<b>1.826</b>	<b>36460.14</b>	<b>7.81</b>	<b>1.49</b>
<b>R.V.Nagar Range</b>									
G.Kothaveedhi	109.614	1506.17	281.912	137.387	377.338	0	2412.421	0.00	0.00
Gudem	282.678	3163.436	362.064	190.686	564.762	0	4563.626	0.00	0.00
Lankapakalu	52.85	5093.713	1138.388	288.691	1037.936	0	7611.578	0.00	3.31
Mandapalli	228.78	4211.793	495.57	235.674	762.59	0	5934.407	0.00	0.00
Pedavalasa_North	21.947	1804.805	383.676	214.461	632.468	0	3057.357	0.00	0.00
Pedavalasa_South	374.881	3817.501	382.571	206.639	421.714	0	5203.306	0.00	1.54
R.V.Nagar	10.528	2645.837	471.694	192.447	294.639	0	3615.145	0.00	0.00
Sapparla	50.023	4636.083	870.803	273.473	761.477	0	6591.859	0.00	0.00
<b>Total</b>	<b>1131.301</b>	<b>26879.34</b>	<b>4386.678</b>	<b>1739.458</b>	<b>4852.924</b>	<b>0</b>	<b>38989.7</b>	<b>0.00</b>	<b>4.85</b>
<b>Sileru Range</b>									
A.Dharakonda	66.576	3311.812	878.683	375.511	1139.977	30.372	5802.931	0.00	0.00
Dharakonda	0	1100.909	754.158	257.451	540.131	0	2652.649	0.00	0.00
Duppulawada	1.059	808.969	773.738	407.119	1115.852	0	3106.737	0.00	0.00
Kondajartha	54.887	2853.203	491.447	122.816	366.961	0	3889.314	0.00	0.00
Sadigunta	2.009	1894.055	981.382	374.427	657.834	0	3909.707	0.00	0.00
Sileru	3.116	4051.391	2060.187	313.301	467.855	19.075	6914.925	0.00	0.00
Thokarai	9.525	2016.506	389.947	97.13	296.017	0	2809.125	0.00	0.00
<b>Total</b>	<b>137.172</b>	<b>16036.85</b>	<b>6329.542</b>	<b>1947.755</b>	<b>4584.627</b>	<b>49.447</b>	<b>29085.39</b>	<b>0.00</b>	<b>0.00</b>
<b>Division Total</b>	<b>9814.51</b>	<b>156465.8</b>	<b>27907.32</b>	<b>12196.96</b>	<b>28934.99</b>	<b>54.634</b>	<b>235374.2</b>	<b>22.46</b>	<b>-8.31</b>





## 4.16 PADERU DIVISION

### 4.16.1 Introduction:

Paderu Forest Division lies in the northern part of Vishakhapatnam district between latitudes 17° 55' 48" and 18° 32' 59" N and longitudes 82° 18' 41" and 83° 01' 04" E. Geographical area of the Division is 2336 km<sup>2</sup> which is 20.93 % of the geographic area of district. The Division has two physiographic zones, the plains and the hills. The major river falling in the Division is Machkund flowing to north.

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

The Division's geology comprises of the oldest formation of charnokite series and predominant khondalite group of rocks of pre-Cambrian age. The rocks are essentially Khondalite group with a few charnokite bands, granites, quartzites, calcigranulites and pegmatites. The soil types found in the division are sandy soils of khondalites and quartzites, clayey sands of charnokites and granites; black cotton soils are seen in K. Kotapadu, Devarapalli, Cheedikada, Paderu and Hukumpeta Mandals.

The climate of Paderu Division is characterized by high humidity throughout the year with oppressive summer and good seasonal rainfall. The climate of the hill parts of the Division is different from that of the plains. Altitude varies from 90 M to 1500 M above MSL. Temperature ranges from 10° C to 35°C and the annual rainfall is about 1320mm.

Population of the Division is 0.32 million (2011 Census) which is 9% of the total population of the district, per capita forest is 0.32 Ha and the population density is 101 persons per Km<sup>2</sup>.

### 4.16.2 Recorded Forest Area:

The notified forest area of the Division is **1011.52 Km<sup>2</sup>** which is 43.3% of the geographical area. Reserved, Protected and un-classed forests constitute 719.52 Km<sup>2</sup> (71.1%), 285.2 Km<sup>2</sup> (28.2%) and 6.8 Km<sup>2</sup> (0.006%) of the forest area respectively.

As per Champion and Seth's classification, the forests of this Division fall into the following classes - Tropical Semi Evergreen Forests, Tropical Moist Mixed Deciduous Forests, Tropical Dry Deciduous Forests, Tropical Dry Evergreen Scrub, Tropical Thorn Forests and Dry Savanna Forests.

### 4.16.3 Protected Area:

There is no Protected Area in this Division.

### 4.16.4 Community Forest Management:

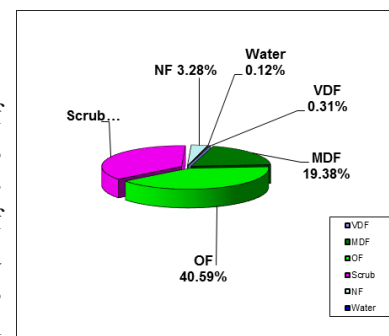
There are 303 VSSs in the Division with 270.90 Km<sup>2</sup> of forest area, which constitutes 26.65 % of forest area.

### 4.16.5 Forest Cover:

The forest cover in the Division based on the interpretation of IRS R2 LISS III 2012 data (Dec / 12/2012) is **610.06 Km<sup>2</sup>** which is **26.11%** of geographical area. In terms of forest canopy density classes the Division has **3.16 Km<sup>2</sup>** of Very Dense Forests, **196.09 Km<sup>2</sup>** of Moderately Dense Forests and **410.62 Km<sup>2</sup>** of Open Forests. The area of the Scrub is **367.02 Km<sup>2</sup>**, Non-Forest **33.21 Km<sup>2</sup>** and Water Bodies **1.24 Km<sup>2</sup>**. The distribution of the forest cover of the Division is shown in Fig 4.16.1.

**Table 4.16.1: Land use Pattern**

Land use	Area in Km <sup>2</sup>	Percentage
Forest including Scrub	776.52	33.24
Agriculture	532.22	22.78
Land with Scrub	515.51	22.07
Fallow Lands	64.99	2.78
Grasslands	3.27	0.14
Settlements	2.03	0.09
Vegetation outside Forest	348.63	14.92
Water bodies	93.04	3.98
<b>Total</b>	<b>2336.20</b>	



**Fig 4.16.1**

#### 4.16.6 Change in Forest Cover:

The Satellite images of 2011 and 2012 seasons are shown in Figs. 4.16.2 and 4.16.3 respectively and the changes between this period are shown on the image of 2012.

Comparison of the current forest cover with that of previous assessment year shows a **negative change in forest cover of 18.79Ha**. The forest cover change matrix given in Table 4.16.2 reveals that there is a decrease of **18.89 Ha** of open forest and **73.87 Ha** of scrub and increase of **92.68 Ha** of Non Forest.

The total negative change of **102.73 Ha** on account of encroachments and the total positive change of **2.43 Ha** is on account of raising plantations. Therefore the **net loss of forest cover is 102.73 Ha** in the Division.

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 changes in these 11 Beats are shown in Table 4.16.3.

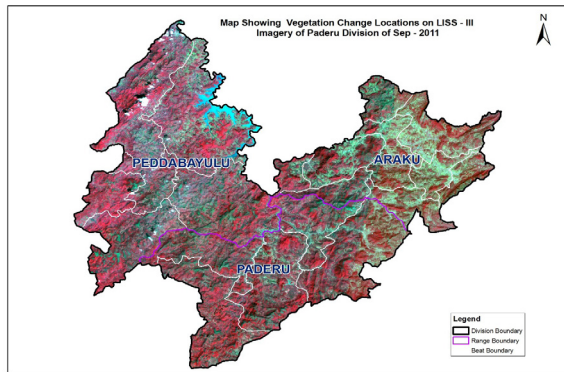


Fig 4.16.2

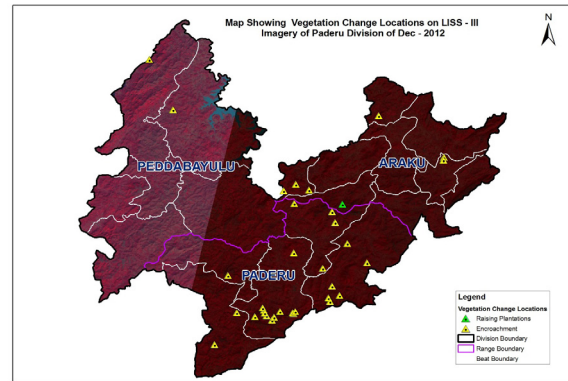


Fig 4.16.3

Table 4.16.1: Forest Cover change matrix (Area in Km <sup>2</sup> )							
2011	2012						Total of 2011
	VDF	MDF	OF	Scrub	NF	Water	
Very Dense Forest	3.16	0.00	0.00	0.00	0.00	0.00	3.16
Moderately Dense Forest	0.00	196.09	0.00	0.00	0.00	0.00	196.09
Open Forest	0.00	0.00	410.62	0.08	0.11	0.00	410.81
Scrub	0.00	0.00	0.00	367.10	0.84	0.00	367.94
Non-Forest	0.00	0.00	0.00	0.02	32.26	0.00	32.28
Water	0.00	0.00	0.00	0.00	0.00	1.24	1.24
<b>Total of 2012</b>	<b>3.16</b>	<b>196.09</b>	<b>410.62</b>	<b>367.20</b>	<b>33.21</b>	<b>1.24</b>	<b>1011.52</b>
<b>Net Change</b>	<b>0.00</b>	<b>0.00</b>	<b>-0.19</b>	<b>-0.74</b>	<b>0.93</b>	<b>0.00</b>	

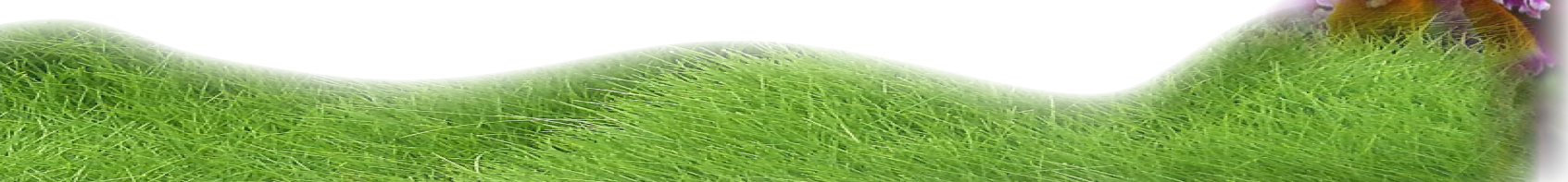




Table 4.16.5: List of Beats showing Forest Cover with changes								(Area in Ha)	
BEAT	VDF	MDF	OF	SF	NF	WB	Total	Encroachment	Net change
<b>Araku Range</b>									
Araku	0.00	308.91	1,653.56	1,647.43	119.71	0.00	3,729.61	0.00	0.00
Arama	0.00	150.60	1,411.37	1,405.60	132.80	0.00	3,100.37	0.00	-2.43
Gasaba	0.00	132.14	703.29	1,131.96	87.35	0.00	2,054.74	2.29	-2.29
Guntaseema	0.55	518.50	1,036.57	127.22	5.60	0.00	1,688.43	5.60	-5.60
Kandrum	0.00	677.97	2,182.98	739.03	15.93	0.00	3,615.91	0.00	0.00
Madagada	0.00	48.08	485.94	1,335.44	288.47	0.00	2,157.93	2.53	-2.53
Mulayagalugu	0.00	376.15	1,763.18	1,736.11	88.06	0.00	3,963.50	0.00	0.00
Paraseela	0.00	119.58	638.07	1,088.07	154.14	0.00	1,999.86	0.00	0.00
Sukarametta	0.00	95.80	616.63	1,208.71	273.27	0.00	2,194.42	0.00	0.00
<b>Total</b>	<b>0.546</b>	<b>2427.724</b>	<b>10491.58</b>	<b>10419.58</b>	<b>1165.34</b>	<b>0</b>	<b>24504.769</b>	<b>10.42</b>	<b>-12.85</b>
<b>Paderu Range</b>									
Badimela	2.13	934.08	3,084.95	2,231.28	79.76	0.00	6,332.20	2.67	-2.67
G.Madugula	17.80	2,262.66	4,207.81	2,049.25	60.63	0.00	8,598.14	3.26	-3.26
Kinchumanda	0.00	453.32	2,846.85	1,862.83	302.16	0.00	5,465.16	45.02	-45.02
Paderu	10.86	1,517.73	4,080.78	2,116.31	54.62	0.00	7,780.29	14.65	-14.65
Sukuru	7.87	1,360.91	4,364.07	3,007.24	147.03	0.00	8,887.14	23.70	-23.70
<b>Total</b>	<b>38.65</b>	<b>6528.696</b>	<b>18584.47</b>	<b>11266.91</b>	<b>644.194</b>	<b>0</b>	<b>37062.916</b>	<b>89.30</b>	<b>-89.30</b>
<b>Peddabayulu Range</b>									
Aradakota	5.26	1,427.80	3,540.31	4,584.48	351.40	0.00	9,909.25	0.00	0.00
Busiput	42.80	1,850.04	903.24	600.44	157.28	0.01	3,553.82	0.00	0.00
Ginnelakota	104.45	2,751.47	1,993.66	3,847.52	441.07	0.91	9,139.08	0.00	0.00
Machipuram	115.42	2,935.90	2,760.37	3,209.07	395.87	116.61	9,533.24	1.65	-1.65
Rudakota	0.60	376.68	715.47	1,635.01	144.44	5.25	2,877.45	0.00	0.00
Sujanakota	8.09	1,310.09	2,072.92	1,157.30	21.34	1.47	4,571.20	1.36	-1.36
<b>Total</b>	<b>276.6</b>	<b>10651.97</b>	<b>11985.97</b>	<b>15033.82</b>	<b>1511.4</b>	<b>124.3</b>	<b>39584.042</b>	<b>3.01</b>	<b>-3.01</b>
<b>Grand Total</b>	<b>315.8</b>	<b>19608.39</b>	<b>41062.02</b>	<b>36720.31</b>	<b>3320.93</b>	<b>124.3</b>	<b>101151.73</b>	<b>102.73</b>	<b>-105.16</b>



## 4.17 SRIKAKULAM DIVISION

### 4.17.1 Introduction:

Srikakulam Forest Division which is co-terminus with the district lies in the north-eastern part of Andhra Pradesh between latitudes 17° 45'' and 19° 30'' N and longitudes 82° 38' and 84° 45' E. The geographical area of the Division is 5953.50Km<sup>2</sup>. The Division has two physiographic zones, i.e., the hills and the plains which are known as agency and non-agency areas respectively. The altitude varies from 91 M to 1524 M above MSL. The slope is north and northwest-south and south-east. The major rivers are Nagavali and Vamshadhara.

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 17° C to 37° C and the annual rainfall is about 1225 mm, received mainly from south-west monsoons.

Minerals like Manganese ore, Graphite, lime stone, Iron ore & Mica occur in the Division. The soil types found are sandy and clayey formed due to weathering of underlying rocks such as granites, gneisses and other allied rocks.

Population of the Division is 2.69 million (2011 Census), per capita forest area is 0.03 Ha and the population density is 462 persons per Km<sup>2</sup>.

**Table 4.17.1: Land use Pattern**

Land use	Area in Km <sup>2</sup>	Percentage
Forest including Scrub	677.52	11.38
Agriculture	3561.68	59.83
Land with Scrub	541.12	9.09
Fallow Lands	60.72	1.02
Orchards	321.46	5.4
Settlements	31.55	0.53
Not available for cultivation	523.86	8.8
Rivers/Streams	235.14	3.95
<b>Total</b>	<b>5953.50</b>	

### 4.17.2 Recorded Forest Area:

The total notified forest area of the Division is **721.72 km<sup>2</sup>** which is 12.21 % of the geographical area. Reserved, Protected and Un-classed forest constitutes 422.45km<sup>2</sup>(61%), 242.79 km<sup>2</sup> (35%) and 21.17 km<sup>2</sup> (3%) of the total forest area respectively.

As per Champion and Seth's classification, the forests of the Division fall under Tropical Semi Evergreen, Tropical Moist Deciduous (Mixed, Sal, and Hilly savanna), Dry Deciduous (mixed, thorn) and Tropical dry evergreen (Misc. forests) types.

### 4.17.3 Protected Area:

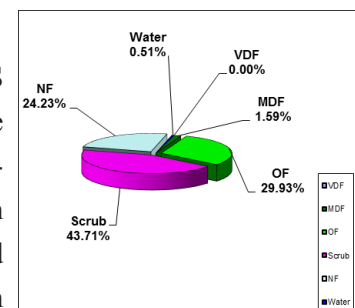
There is no Protected Area in this Division.

### 4.17.4 Community Forest Management:

There are 282 VSSs in the Division having an area of 290.20 Km<sup>2</sup> of forests, which constitutes 40.21 % of forest area.

### 4.17.5 Forest Cover:

The forest cover in the Division based on the interpretation of IRS R2 LISS III 2011 data (Nov-2012) is **227.55 km<sup>2</sup>** which is **3.82%** of the geographical area. In terms of the forest canopy density classes, the Division has **11.52 Km<sup>2</sup>** of Moderately Dense Forests and **216.03 Km<sup>2</sup>** of Open Forests. The area of the Scrub is **315.53 Km<sup>2</sup>**, Non-Forest **174.91 Km<sup>2</sup>** and Water Bodies **3.72 Km<sup>2</sup>**. The distribution of the forest cover of the Division is shown in Fig 4.17.1.



**Fig 4.17.1**



#### 4.17.6 Change in Forest Cover:

The Satellite images of 2011 and 2012 seasons are shown in Figs. 4.17.2 and 4.17.3 respectively and the changes between this period are shown on the image of 2012.

Comparison of the current forest cover with that of previous assessment year shows a negative change in forest cover of **4.11 Ha**. The forest cover change matrix given in Table 4.17.2 reveals that there is a decrease of **4.11 Ha** of open Forests and **13.90 Ha** of scrub.

The total negative change (including scrub) is **23.26 Ha** and Positive change is **5.25 Ha**, which is due to improvement of forest due to protection and management Interventions. Out of **23.26 Ha**, **9.76 Ha** is on account of clearance of jungle growth for raising of plantations and **13.50 Ha** is on account of encroachments. Thus the negative change due to encroachments only are taken as loss of forest cover. Therefore, the net losses of forest cover is **13.50 Ha** only.

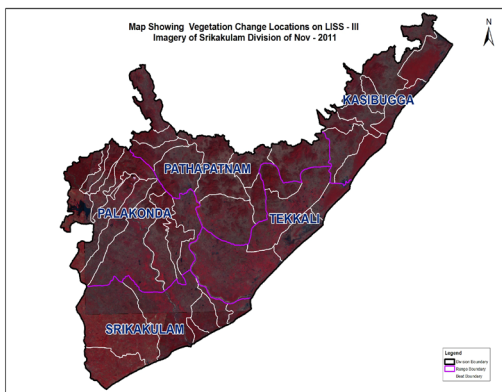


Fig 4.17.2

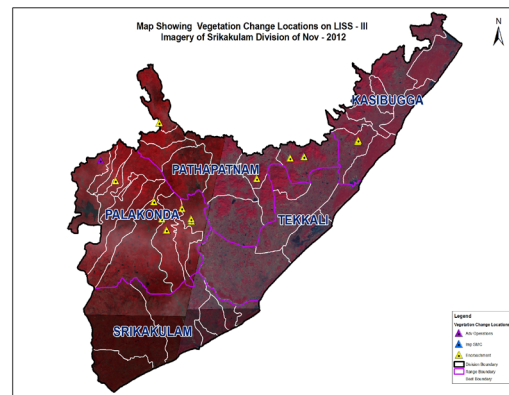


Fig 4.17.3

There are 43 Beats in the Division. Negative changes in forest cover are noticed in 8 Beats and Positive changes in forest cover are noticed in 1 Beat. There are no changes in the remaining 34 Beats. Details of forest cover changes in the 9 Beats along with other Beats mentioned above are shown in Table 4.17.3.

Table 4.17.2: Forest Cover change matrix (Area in Km2)							
2011	2012						Total of 2011
	VDF	MDF	OF	SF	NF	Water	
Very Dense Forest	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Moderately Dense Forest	0.00	11.52	0.00	0.00	0.00	0.00	11.52
Open Forest	0.00	0.00	216.03	0.00	0.04	0.00	216.07
Scrub	0.00	0.00	0.00	315.48	0.19	0.00	315.67
Non-Forest	0.00	0.00	0.00	0.05	174.68	0.00	174.73
Water	0.00	0.00	0.00	0.00	0.00	3.72	3.72
<b>Total of 2012</b>	<b>0.00</b>	<b>11.52</b>	<b>216.03</b>	<b>315.53</b>	<b>174.91</b>	<b>3.72</b>	<b>721.71</b>
Net Change	0.00	0.00	-0.04	-0.14	0.18	0.00	



Table 4.17.3: List of Beats showing Forest Cover with changes							(Area in Ha)	
BEAT	MDF	OF	SF	NF	WB	Total	Net Change	Encroachment
<b>Kasibugga Range</b>								
Baruva	0.00	14.99	51.73	362.77	39.58	469.07	0.00	0.00
Bogabanda	0.00	334.03	414.84	48.50	0.00	797.37	0.00	0.00
Bogabani	54.71	1,452.10	1,269.10	299.43	0.00	3,075.34	0.00	0.00
Budarsingi	0.00	221.18	605.65	419.00	0.00	1,245.83	0.00	0.00
K.V. Palem	0.00	0.35	32.34	370.47	152.87	556.02	0.00	0.00
Makarajola	3.06	366.54	926.59	543.37	0.00	1,839.55	-2.09	2.09
Mandasa	0.00	260.47	1,234.78	282.11	0.00	1,777.36	0.00	0.00
Metturu	0.00	55.04	235.64	90.25	0.00	380.93	0.00	0.00
Sunkidi	0.00	96.92	559.15	317.90	0.00	973.98	0.00	0.00
<b>Total</b>	<b>57.77</b>	<b>2,801.62</b>	<b>5,329.82</b>	<b>2,733.80</b>	<b>192.45</b>	<b>11,115.46</b>	<b>-2.09</b>	<b>2.09</b>
<b>Palakonda Range</b>								
Antikonda	0.00	148.68	501.21	694.29	0.00	1,344.18	0.00	0.00
Bodlapadu	22.34	494.17	781.33	323.41	0.00	1,621.24	0.00	0.00
Burna Central	91.80	377.96	265.36	179.32	0.00	914.44	-2.02	2.02
Burna East	14.69	260.24	151.98	18.67	0.00	445.58	0.00	0.00
Burna North	218.01	543.97	255.06	122.32	0.00	1,139.36	0.00	0.00
Burna West	0.00	167.31	201.04	240.54	0.00	608.88	0.00	0.00
Chinagora	112.28	786.25	850.83	674.19	0.00	2,423.55	-9.76	0.00
Gudivada	38.83	453.85	407.18	345.56	0.00	1,245.41	0.00	0.00
Kadagandi East	0.00	187.94	681.94	588.34	0.00	1,458.22	-3.32	-3.32
Kadagandi West	5.69	387.65	556.32	352.46	0.00	1,302.13	-1.27	-1.27
Palakonda	54.56	386.94	803.57	844.21	0.00	2,089.28	-1.55	1.55
Tankidi	83.92	1,118.16	599.43	83.29	0.00	1,884.80	0.00	0.00
<b>Total</b>	<b>642.12</b>	<b>5,313.11</b>	<b>6,055.25</b>	<b>4,466.59</b>	<b>0.00</b>	<b>16,477.07</b>	<b>-17.92</b>	<b>-1.02</b>
<b>Pathapatnam Range</b>								
Antharaba	4.75	587.33	1,239.98	417.85	0.00	2,249.91	5.25	0.00
Bagga	30.18	1,581.72	1,897.76	604.11	0.00	4,113.77	0.00	0.00
Baleru	9.66	794.84	2,140.08	709.31	0.00	3,653.90	-0.60	-0.60
Jadupalli	133.67	1,903.24	1,273.91	432.01	0.00	3,742.83	-2.65	2.65
Korada	37.85	1,694.82	2,081.34	502.54	0.00	4,316.55	0.00	0.00
Polavaram	49.48	1,131.37	1,353.61	442.80	0.00	2,977.26	0.00	0.00
Rugada	4.33	725.86	1,771.95	723.22	0.00	3,225.35	0.00	0.00
Saravakota	0.00	631.20	1,511.27	407.27	0.00	2,549.74	0.00	0.00
Sudiraikonda'	1.33	874.41	2,151.54	759.11	0.00	3,786.39	0.00	0.00
Temburu	1.15	1,019.64	1,236.50	274.69	0.00	2,531.97	0.00	0.00
<b>Total</b>	<b>272.40</b>	<b>10,944.41</b>	<b>16,657.93</b>	<b>5,272.92</b>	<b>0.00</b>	<b>33,147.66</b>	<b>2.00</b>	<b>2.05</b>
<b>Srikakulam Range</b>								
Balarampuram	0.00	16.26	55.77	436.14	20.83	529.00	0.00	0.00
Dharmavaram	0.00	114.90	210.20	590.64	27.27	943.00	0.00	0.00
Kalingapatnam	0.00	97.06	100.43	248.60	30.83	476.91	0.00	0.00
Kotapalem	0.00	10.04	111.24	846.30	52.33	1,019.90	0.00	0.00

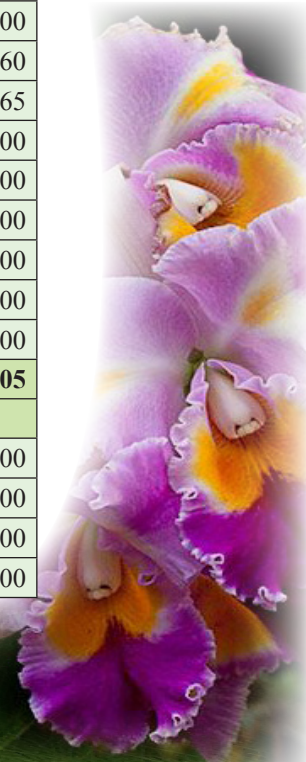




Table 4.17.3: List of Beats showing Forest Cover with changes							(Area in Ha)	
BEAT	MDF	OF	SF	NF	WB	Total	Net Change	Encro - achment
Kuppili	0.00	0.00	0.60	314.17	22.91	337.68	0.00	0.00
Machilesam	0.00	7.85	25.07	292.93	0.64	326.49	0.00	0.00
Vatsavalasa	0.00	13.77	65.03	87.06	0.00	165.86	0.00	0.00
<b>Total</b>	<b>0.00</b>	<b>259.87</b>	<b>568.33</b>	<b>2,815.84</b>	<b>154.80</b>	<b>3,798.84</b>	<b>0.00</b>	<b>0.00</b>
<b>Tekkali Range</b>								
Amalapadu	3.34	224.57	376.92	568.43	11.48	1,184.74	0.00	0.00
Ampalam	0.00	134.09	225.76	480.18	13.59	853.63	0.00	0.00
Mulapeta	0.00	15.23	103.82	517.20	0.00	636.25	0.00	0.00
Narsingapalli	176.67	1,766.81	1,678.42	464.13	0.00	4,086.03	0.00	0.00
Sariapalli	0.21	145.18	559.47	167.03	0.00	871.89	0.00	0.00
<b>Total</b>	<b>180.22</b>	<b>2,285.89</b>	<b>2,944.38</b>	<b>2,196.98</b>	<b>25.08</b>	<b>7,632.53</b>	<b>0.00</b>	<b>0.00</b>
<b>Grand Total</b>	<b>1,152.51</b>	<b>21,604.90</b>	<b>31,555.71</b>	<b>17,486.12</b>	<b>372.33</b>	<b>72,171.56</b>	<b>-18.01</b>	<b>3.12</b>



## 4.18 VIZIANAGARAM DIVISION

### 4.18.1 Introduction:

Vizianagaram Forest Division which is co-terminus with the district lies in the north-eastern part of Andhra Pradesh between latitudes 17° 51' and 19° 9' N and longitudes 82° 58' and 83° 49' E. Geographical area of the Division is 6261 Km<sup>2</sup>. The Division has two physiographic zones, the plains and the Hills. The major rivers in the district are Nagavali, Vegavathi, Gomuki and Suvarnamukhi.

Land use pattern of the division is given in Table 4.18.1.

The climate of this district is characterized by high humidity all round the year with oppressive summer and good seasonal rainfall. The climate of the hill parts of the district is different from that of the plains. The temperature varies from 17.1° C to 39.6° C. The main soils in the district are red, sandy loams and sandy clay.

The average annual rainfall of the Division is 1,131 mm. The Division gets the benefit both from the south-west and the north-east monsoons.

Population of the Division is 2.34 million as per 2011 census and the per capita forest is 0.05 Ha. The population density is 358 persons per Km<sup>2</sup>.

Table 4.18.1: Land use Pattern

Land use	Area in Km <sup>2</sup>	Percentage
Forest including Scrub	1187.91	18.97
Agriculture	3244.78	51.82
Land with Scrub	777.07	12.41
Fallow Lands	23.79	0.38
Grasslands	0.63	0.01
Settlements	25.67	0.41
Not available for cultivation	869.74	13.89
Rivers/Streams	132.12	2.11
<b>Total</b>	<b>6261.64</b>	

### 4.18.2 Recorded Forest Area:

The area of notified forests in the Division is **1219.28 Km<sup>2</sup>** which is 18.24% of the geographical area. Reserved, Protected and un-classed forests constitute 716.27 Km<sup>2</sup> (60%), 420.10 Km<sup>2</sup> (35.2%) and 56.66 Km<sup>2</sup> (0.047%) of the forest area respectively.

As per Champion and Seth's classification, the forests of the Division fall under Southern Tropical Moist Mixed Deciduous Forests, Northern Tropical Dry Deciduous Forests, Southern Tropical Dry Mixed Deciduous Forests and Tropical Dry evergreen Forests.

### 4.18.3 Protected Area:

There is no Protected Area in this Division.

### 4.18.4 Community Forest Management:

There are 265 VSSs in the Division. The forest area comprising of 305.59 Km<sup>2</sup>, which is 25% of the total forest area in the division is under the management of communities.

### 4.18.5 Forest Cover:

The forest cover in the Division based on the interpretation of IRS R2 LISS III 2012 data (Oct 2012) is **1020.89 Km<sup>2</sup>**, which is **16.30%** of the geographical area. In terms of the forest canopy density classes, the Division has **0.06 Km<sup>2</sup>** of Very Dense Forests, the Division has **530.41 Km<sup>2</sup>** of Moderately Dense Forests and **490.42 Km<sup>2</sup>** of Open Forests. The area of the Scrub, Non-Forest and Water Bodies are **121.47 Km<sup>2</sup>**, **73.75 Km<sup>2</sup>** and **3.17 Km<sup>2</sup>** respectively. The distribution of the forest cover of the Division is shown in Fig 4.18.1.

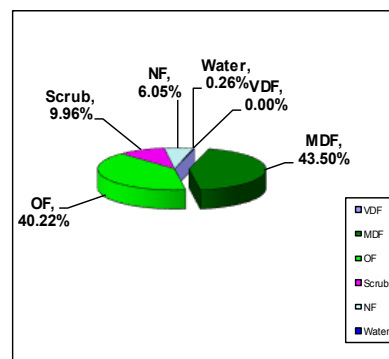


Fig.4.18.1



#### 4.18.6 Change in Forest Cover:

The Satellite images of 2011 and 2012 seasons are shown in Figs. 4.18.2 and 4.18.3 Respectively and the changes between this Period are shown on the image of 2012.

Comparison of the current forest cover with that of previous assessment year shows a **negative change in the forest cover of 35.76 Ha**. The forest cover change matrix given in Table 4.18.2 reveals that there is a decrease of **17.37 Ha** of moderately dense forest and **18.39 Ha** of open forest.

The total negative change (including scrub) of **35.76 Ha** are primarily attributed to encroachments, which accounts for **32.64 Ha** and the remaining **3.12 Ha** loss is due to clearance of jungle growth for raising of plantations. Therefore, the **net loss of forest cover in the Division is 32.64 Ha**.

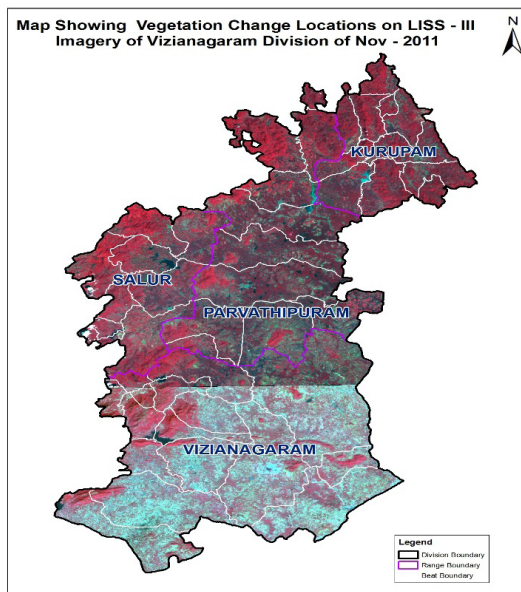


Fig 4.18.2

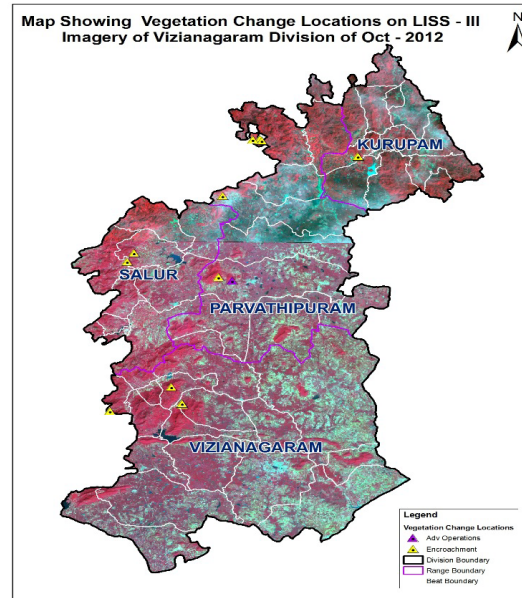


Fig 4.18.3

There are 49 Beats in the Division. Negative changes in forest cover are noticed in 8 Beats. There are no changes in the remaining 41 Beats.

Details of forest cover change in these 8 Beats and along with other Beats are shown in Table 4.18.3.

Table 4.18.2: Forest Cover change matrix		(Area in Km <sup>2</sup> )					
2011	2012						Total of 2011
	VDF	MDF	OF	Scrub	NF	Water	
Very Dense Forest	0.06	0.00	0.00	0.00	0.00	0.00	0.06
Moderately Dense Forest	0.00	530.41	0.00	0.07	0.10	0.00	530.58
Open Forest	0.00	0.00	490.42	0.03	0.15	0.00	490.60
Scrub	0.00	0.00	0.00	121.37	0.00	0.00	121.37
Non-Forest	0.00	0.00	0.00	0.00	73.50	0.00	73.50
Water	0.00	0.00	0.00	0.00	0.00	3.17	3.17
<b>Total of 2012</b>	<b>0.06</b>	<b>530.41</b>	<b>490.42</b>	<b>121.47</b>	<b>73.75</b>	<b>3.17</b>	<b>1219.28</b>
Net Change	0.00	-0.17	-0.18	0.10	0.25	0.00	

Table 4.18.3: List of Beats showing Forest Cover with changes.								(Area in Ha)	
BEAT	VDF	MDF	OF	SF	NF	WB	Total	Net Change	Encroachment
<b>Kurupam Range</b>									
Arnada	0.00	2377.09	2733.76	258.37	67.73	0.00	5436.95	0.00	0.00
Bori	0.00	374.53	322.96	118.46	102.45	1.04	919.45	0.00	0.00
Bothili	0.00	545.75	608.01	139.59	76.50	0.00	1369.84	0.00	0.00
Darsini	0.00	623.42	244.22	54.34	19.04	0.00	941.03	0.00	0.00
Elwinpeta	0.00	1289.71	1125.33	205.94	113.70	0.00	2734.67	0.00	0.00
Gorada	0.00	2093.04	1646.46	163.97	82.49	0.00	3985.96	0.00	0.00
Kedaripuram	0.00	872.54	247.13	48.09	24.57	0.00	1192.32	0.00	0.00
Kurupam	0.00	1448.92	334.22	59.19	68.29	0.00	1910.61	-2.22	2.22
Manda	0.00	1702.18	559.35	47.06	22.94	0.00	2331.53	0.00	0.00
Mondemkhall	0.00	1121.95	2255.96	1011.38	839.91	5.85	5235.06	0.00	0.00
Neelakantapuram	0.00	1233.68	868.09	26.66	2.51	0.00	2130.94	0.00	0.00
Panasabadra	0.00	1963.54	3483.92	622.59	489.54	0.00	6559.59	0.00	0.00
<b>Total</b>	<b>0.00</b>	<b>15646.35</b>	<b>14429.40</b>	<b>2755.64</b>	<b>1909.66</b>	<b>6.89</b>	<b>34747.94</b>	<b>-2.22</b>	<b>2.22</b>
<b>Parvathipuram Range</b>									
Bobbili	0.00	1483.63	641.98	225.53	185.71	0.00	2536.85	-5.54	2.42
Goipaka	0.00	1055.65	726.28	81.62	29.34	0.00	1892.88	0.00	0.00
Gutchimi	0.00	526.94	420.00	91.12	66.28	0.00	1104.35	0.00	0.00
Masimanda	3.27	7796.00	1224.94	166.72	94.74	0.00	9285.66	-6.20	6.20
Parvathipuram (N)	0.00	942.64	94.64	13.42	6.33	0.00	1057.04	0.00	0.00
Parvathipuram South	0.00	1645.80	189.18	76.59	71.94	0.00	1983.51	-1.77	1.77
Poram	0.00	380.33	422.90	34.87	28.42	0.00	866.52	0.00	0.00
Pujariguda	0.00	2647.26	1518.78	138.96	55.77	0.00	4360.76	0.00	0.00
Saluru (E)	0.00	880.05	996.61	59.95	32.91	0.00	1969.51	0.00	0.00
Shikarganj	0.00	713.83	632.23	181.42	272.26	0.00	1799.75	0.00	0.00
<b>Total</b>	<b>3.27</b>	<b>18072.13</b>	<b>6867.54</b>	<b>1070.19</b>	<b>843.70</b>	<b>0.00</b>	<b>26856.82</b>	<b>-13.51</b>	<b>10.39</b>
<b>Salur Range</b>									
Butchampadu	0.00	163.52	469.96	103.11	298.83	195.09	1230.51	0.00	0.00
Duggeru	2.26	5128.06	1336.14	270.42	74.76	0.00	6811.64	0.00	0.00
Kankanapalli	0.00	1559.30	1899.33	312.34	113.96	0.57	3885.51	0.00	0.00
Kesali	0.00	114.14	428.17	21.97	13.10	0.85	578.22	0.00	0.00
Kurukutti	0.00	1002.79	1250.51	265.09	404.49	60.51	2983.39	0.00	0.00
Makkuva	0.00	608.38	200.36	64.67	15.71	0.00	889.11	0.00	0.00
Mothumuru	0.00	2454.63	2520.59	504.91	221.87	8.12	5710.13	0.00	0.00
Pachipenta	0.00	158.89	286.45	27.08	49.23	16.17	537.81	0.00	0.00
Saluru	0.00	888.36	1714.00	381.80	238.75	0.00	3222.91	0.00	0.00
Thonam	0.00	2733.21	655.43	61.65	37.91	0.00	3488.21	-8.39	8.39
<b>Total</b>	<b>2.26</b>	<b>14811.29</b>	<b>10760.92</b>	<b>2013.04</b>	<b>1468.62</b>	<b>281.31</b>	<b>29337.44</b>	<b>-8.39</b>	<b>8.39</b>
<b>Vizianagaram Range</b>									
Andra	0.00	1189.78	333.68	51.63	8.93	0.00	1584.01	0.00	0.00
Bhimaram	0.00	254.05	1875.55	566.78	192.74	0.00	2889.12	-3.10	3.10

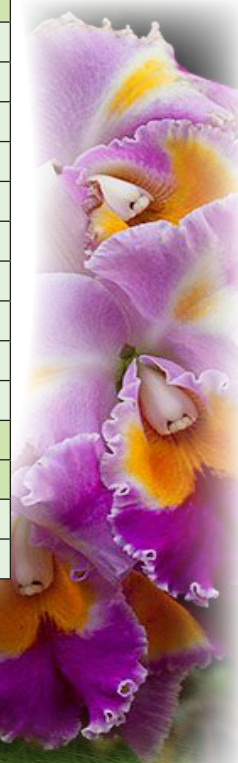




Table 4.18.3: List of Beats showing Forest Cover with changes.								(Area in Ha)	
BEAT	VDF	MDF	OF	SF	NF	WB	Total	Net Change	Encroachment
Damarasingi	0.00	0.00	450.37	480.19	266.72	0.00	1197.27	0.00	0.00
Gantikonda	0.00	258.88	510.61	17.18	0.00	0.00	786.67	0.00	0.00
Kancheru	0.00	85.08	952.62	384.81	117.14	0.00	1539.64	0.00	0.00
Konada	0.00	0.00	5.24	19.64	308.91	3.27	337.06	0.00	0.00
Kothapalem	0.00	375.85	1988.59	493.11	246.99	3.34	3107.87	0.00	0.00
Kumili	0.00	184.98	966.60	251.32	118.27	0.00	1521.17	0.00	0.00
L. Gunnala	0.00	177.00	453.27	117.08	48.15	0.00	795.50	0.00	0.00
Pallapugudaba	0.00	90.48	1167.97	180.91	56.90	0.00	1496.25	0.00	0.00
Pedakonela	0.00	464.96	3153.89	1350.89	312.97	0.00	5282.70	0.00	0.00
Poolbagh	0.00	17.24	390.39	435.69	446.37	0.00	1289.69	0.00	0.00
Rabha	0.00	109.75	1721.65	418.00	166.36	0.00	2415.75	-2.97	2.97
Rompilli	0.00	1037.01	384.17	67.79	49.39	0.00	1538.37	0.00	0.00
Sariapalli	0.00	104.00	1206.65	937.43	472.65	22.05	2742.77	-5.57	5.57
Velgada	0.00	13.83	369.47	297.14	260.82	0.00	941.27	0.00	0.00
Venkayyapalem	0.00	147.87	1052.86	238.95	80.62	0.00	1520.31	0.00	0.00
<b>Total</b>	<b>0.00</b>	<b>4510.75</b>	<b>16983.57</b>	<b>6308.53</b>	<b>3153.92</b>	<b>28.65</b>	<b>30985.42</b>	<b>-11.64</b>	<b>11.64</b>
<b>Grand Total</b>	<b>5.52</b>	<b>53040.51</b>	<b>49041.44</b>	<b>12147.39</b>	<b>7375.90</b>	<b>316.85</b>	<b>121927.62</b>	<b>-35.76</b>	<b>32.64</b>



## 4.19 Vishakhapatnam Division

### 4.19.1 Introduction:

Vishakhapatnam Forest Division lies in the southern part of Vishakhapatnam district between latitudes 17° 15' 00" and 18° 26' 25" N and longitudes 82° 31' 04" and 83° 27' 40" E. Geographical area of the Division is 5069 Km<sup>2</sup> which is 45 % of the geographical area of the district. The Division has two physiographic zones, the plains and the Hills. The major rivers falling in the Division are Thandava, Varaha and Sharada.

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

There are 3 major soil types in the Division. These are sandy, clayey sands and coastal sand dunes.

The climate of Vishakhapatnam Division is characterized by high humidity nearly all through the year with oppressive summer and good seasonal rainfall. The climate of the hill parts of the Division is different from that of the plains. Altitude varies from 90 M to 1500 M above MSL. Temperatures range from 18°C to 45°C and the annual rainfall is about 1202mm, received mainly from the south-west and the north-east monsoons. Population of the Division is 3.45 million (2011 Census) which is 79% of the population of the district. The per capita forest is 0.04 Ha and the population density of the Division is 916 persons per Km<sup>2</sup>.

**Table 4.19.1: Land use Pattern**

Land use	Area in Km <sup>2</sup>	Percentage
Forest including Scrub	1162.63	22.93
Agriculture	2085.9	41.14
Land with Scrub	495.36	9.77
Fallow Lands	407.97	8.05
Grasslands	0.49	0.01
Settlements	78.09	1.54
Vegetation outside Forest	616.29	12.16
Water bodies	223.05	4.4
<b>Total</b>	<b>5069.80</b>	

### 4.19.2 Recorded Forest Area:

The notified forest area of the Division is **1266.09 Km<sup>2</sup>** which is 25% of the geographical area. Reserved, Protected and Un-classed forests constitute 586.6 Km<sup>2</sup> (46%), 678.65 Km<sup>2</sup> (53%) and 0.74 Km<sup>2</sup> (0.06%) of the forest area respectively.

As per Champion and Seth's classification, the forest types in the Division are Southern Tropical Semi Evergreen Forests, Southern Tropical Moist Mixed Deciduous Forests, Southern Tropical Dry Deciduous Forests, Tropical Dry Evergreen Scrub, Tropical Thorn Forests and Dry Savanna Forest.

### 4.19.3 Protected Area:

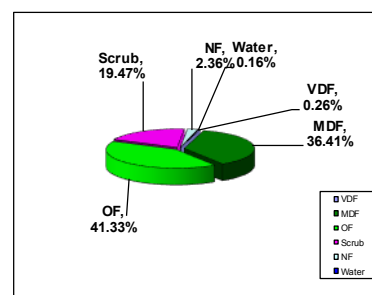
There is one Protected Area, viz., Kambalakonda WLS in the Division having an area of 70.70 km<sup>2</sup>. This is large and sprawling greenery around the Vizag City harbouring diverse flora & fauna.

### 4.19.4 Community Forest Management:

There are 321 Vana Samrakshana Samities (VSSs) in the Division. An area of 271.93 Km<sup>2</sup> of notified forests, which is 21 % of 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 2012 (Data of Oct 2012) is **987.63 Km<sup>2</sup>** which is **19.48%** of the geographical area. In terms of the forest canopy density classes, the Division has **3.34 Km<sup>2</sup>** of Very Dense Forests, **461.01 Km<sup>2</sup>** of Moderately Dense Forests and **523.28 Km<sup>2</sup>** of Open Forests. The area of the scrub is **246.56 Km<sup>2</sup>**, Non-Forest **29.83 Km<sup>2</sup>** and Water Bodies **2.08 Km<sup>2</sup>**. 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 image of 2011 and 2012 seasons are shown in Figs. 4.19.2 and 4.19.3 respectively and the changes between this periods are shown on the image of 2012.

Comparison of the current forest cover with that of previous assessment year shows a **negative change in forest cover of 74.54 Ha**. The change matrix given in Table 4.19.2 reveals that there is a decrease of **36.16 Ha** of moderately dense forest, **38.38 Ha** of open forest and 55.20 Ha of scrub.

The total negative change (including scrub) is **129.74 Ha**. Out of this **41.80 Ha** is on account of clearance of jungle growth for adv operations, **61.39 Ha** is on account of encroachments and **26.55 Ha** is on account of diversion of forest lands for non-forestry purposes. As clearance of jungle growth for raising of plantations is a Forest management intervention and hence not considered as loss of forest cover. Thus the negative change due to encroachment alone is taken as loss of forest cover. Therefore, the **net loss of forest cover is 61.39 Ha** only.

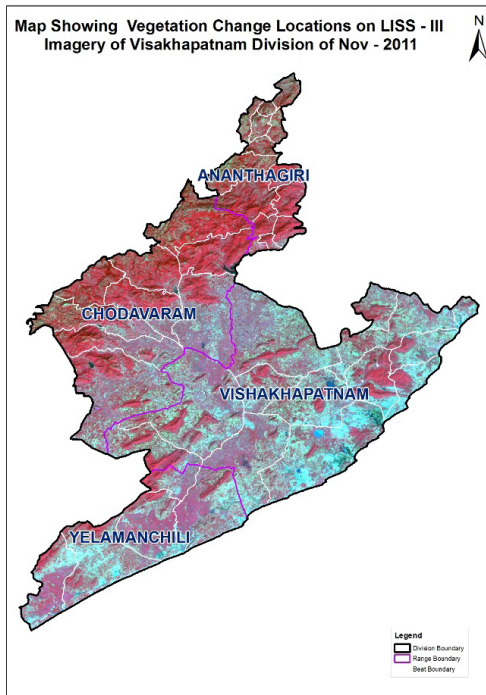


Fig 4.19.2

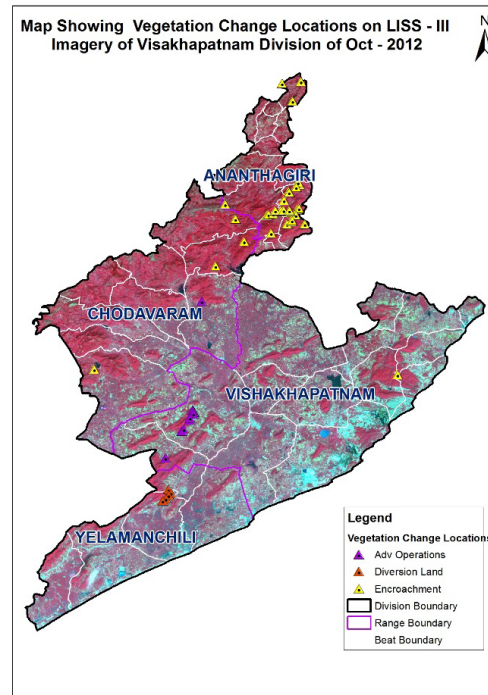


Fig 4.19.3

There are 40 Beats in the Division. Negative changes in forest cover are seen in 14 Beats and there are no changes in the remaining 26 Beats. Details of forest cover changes in the 14 Beats along with other beats are shown in Table 4.19.3.



Table 4.19.2: Forest Cover change matrix							(Area in Km <sup>2</sup> )
2011	2012						Total of 2011
	VDF	MDF	OF	SF	NF	WB	
Very Dense Forest	3.34	0.00	0.00	0.00	0.00	0.00	3.34
Moderately Dense Forest	0.00	461.01	0.00	0.00	0.36	0.00	461.37
Open Forest	0.00	0.00	523.28	0.00	0.38	0.00	523.66
Scrub	0.00	0.00	0.00	246.56	0.55	0.00	247.11
Non-Forest	0.00	0.00	0.00	0.00	28.54	0.00	28.54
Water	0.00	0.00	0.00	0.00	0.00	2.08	2.08
<b>Total of 2012</b>	<b>3.34</b>	<b>461.01</b>	<b>523.28</b>	<b>246.56</b>	<b>29.83</b>	<b>2.08</b>	<b>1266.10</b>
Net Change	0.00	-0.36	-0.38	-0.55	1.29	0.00	

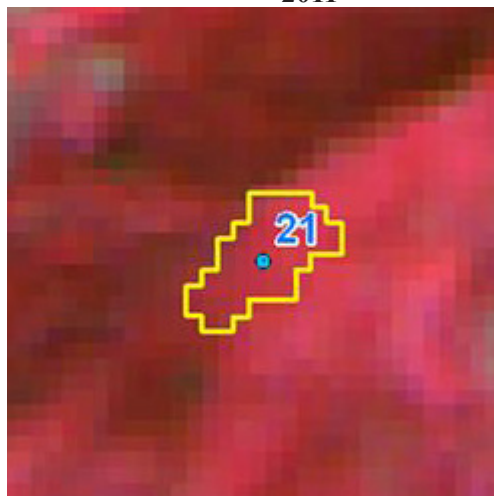
Table 4.19.3: List of Beats showing Forest Cover with changes.								(Area in Ha)	
BEAT	VDF	MDF	OF	SF	NF	WB	TOTAL	Net Change	Encroachment
<b>Ananthagiri Range</b>									
Ananthagiri	1.20	526.72	1,027.92	975.84	228.89	0.00	2,760.57	0.00	0.00
Bondam	0.00	29.82	534.85	706.42	41.95	0.00	1,313.04	0.00	0.00
Borra	0.00	69.78	491.35	529.63	27.24	0.00	1,118.00	0.00	0.00
Chintalapudi	2.09	1,235.90	761.83	113.26	12.06	0.00	2,125.13	-5.51	5.51
Dabbagunta	0.00	1,593.37	1,334.53	178.24	10.47	0.00	3,116.61	-6.95	6.95
Iragai	0.00	3.82	384.51	634.85	9.99	0.00	1,033.17	0.00	0.00
Kasipatnam	0.54	1,492.08	439.58	50.79	0.00	0.00	1,982.98	0.00	0.00
Kuridi	3.05	1,845.38	1,390.81	156.69	32.73	0.00	3,428.64	-22.76	22.76
Lotheru	0.00	86.03	784.95	639.78	22.60	0.00	1,533.36	0.00	0.00
Medaparthu	24.67	2,697.91	3,075.21	856.64	21.93	0.00	6,676.36	-7.29	7.29
Moduga	0.00	61.45	635.91	1,409.52	131.22	0.00	2,238.10	-5.58	5.58
Polamguda	0.00	22.65	362.25	305.75	26.65	0.00	717.30	0.00	0.00
Sontivanipalem	0.00	266.52	367.94	58.92	0.83	0.00	694.22	0.00	0.00
<b>Total</b>	<b>31.54</b>	<b>9,957.61</b>	<b>11,613.55</b>	<b>6,616.33</b>	<b>518.46</b>	<b>0.00</b>	<b>28,737.48</b>	<b>-48.09</b>	<b>48.09</b>
<b>Chodavaram Range</b>									
(Z)Kottapatnam	0.84	2,639.33	2,100.02	673.11	77.70	0.66	5,491.66	-1.51	1.51
Jeenabadu	74.99	5,338.39	2,267.48	293.68	24.30	0.00	7,998.84	-2.53	2.53
Kasipuram	2.21	1,999.92	3,626.58	2,464.55	178.73	0.00	8,271.99	0.00	0.00
Kinthali	2.80	2,814.26	2,278.66	803.06	32.51	0.58	5,931.87	0.00	0.00
Konam	9.66	3,060.44	2,859.60	1,091.96	66.25	0.00	7,087.90	0.00	0.00
Madugula	19.51	3,901.99	1,830.95	305.60	3.72	0.00	6,061.77	0.00	0.00
Minimuluru	12.02	2,839.64	3,506.77	1,089.76	21.17	0.00	7,469.35	0.00	0.00
Tattapudi	171.06	4,053.44	3,232.95	2,058.17	22.74	0.00	9,538.35	-7.45	7.45
Thenugupudi	0.00	1,628.57	1,090.12	140.38	11.41	0.00	2,870.48	-4.32	0.00
<b>Total</b>	<b>293.08</b>	<b>28,285.97</b>	<b>22,798.95</b>	<b>8,920.26</b>	<b>422.72</b>	<b>1.24</b>	<b>60,722.22</b>	<b>-15.81</b>	<b>11.49</b>
<b>Vishakhapatnam Range</b>									
Advanipalem	0.00	115.23	941.49	585.87	80.23	0.00	1,722.82	0.00	0.00
Amanam	0.00	0.00	91.42	423.16	153.32	14.40	682.30	0.00	0.00
Duvvada	0.00	208.57	750.60	541.07	99.38	0.00	1,599.61	0.00	0.00



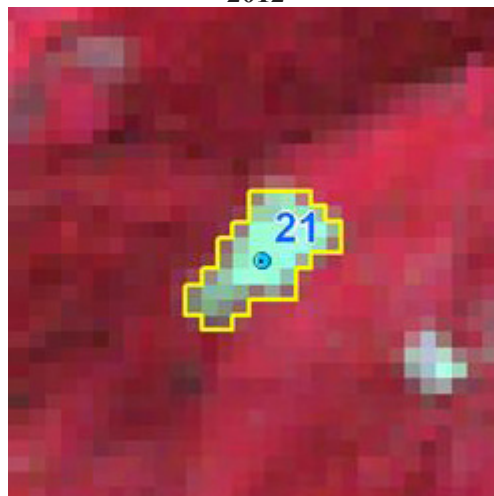


Table 4.19.3: List of Beats showing Forest Cover with changes.								(Area in Ha)	
BEAT	VDF	MDF	OF	SF	NF	WB	TOTAL	Net Change	Encroachment
Kannurupalem	0.00	1,454.44	2,178.42	603.90	47.44	0.00	4,284.20	-8.83	0.00
Mudasarlova	0.00	1,120.85	2,187.34	713.93	116.61	0.00	4,138.73	0.00	0.00
Nallakonda	0.00	371.54	1,243.36	618.57	59.98	0.00	2,293.45	0.00	0.00
Pangidi	0.61	553.93	1,203.89	669.10	225.97	2.89	2,656.39	-28.65	0.00
Paradasipalem	0.00	140.08	1,328.72	596.98	118.62	1.77	2,186.17	0.00	0.00
Parawada	0.00	6.59	315.04	521.59	119.99	0.60	963.81	0.00	0.00
Pothukonda	0.00	315.27	1,030.97	398.76	91.80	0.00	1,836.79	0.00	0.00
Pudimadaka	0.00	0.00	0.00	92.67	120.59	0.00	213.26	0.00	0.00
Sontyam	0.00	58.09	316.25	118.75	8.83	0.00	501.92	0.00	0.00
Yendada	0.00	468.16	1,029.09	392.60	21.61	3.22	1,914.68	-1.81	1.81
<b>Total</b>	<b>0.61</b>	<b>4,812.74</b>	<b>12,627.22</b>	<b>6,305.60</b>	<b>1,225.07</b>	<b>22.88</b>	<b>24,994.13</b>	<b>-39.29</b>	<b>1.81</b>
<b>Yelamanchili Range</b>									
Ellamanchili	5.41	881.35	861.89	110.32	14.91	0.00	1,873.88	-4.91	0.00
Panchadarla	0.00	101.46	674.67	964.84	150.37	24.13	1,915.47	0.00	0.00
Payakaraopet	3.66	645.89	729.65	224.28	23.50	4.87	1,631.86	0.00	0.00
Rebaka	0.00	903.50	1,940.98	915.40	296.17	100.81	4,156.87	0.00	0.00
Regupalem	0.00	547.17	1,118.44	627.46	229.62	54.29	2,576.99	-21.64	0.00
<b>Total</b>	<b>9.07</b>	<b>3,079.38</b>	<b>5,325.63</b>	<b>2,868.86</b>	<b>688.03</b>	<b>184.11</b>	<b>12,155.07</b>	<b>-26.55</b>	<b>0.00</b>
<b>Grand Total</b>	<b>334.31</b>	<b>46,135.69</b>	<b>52,365.35</b>	<b>24,711.05</b>	<b>2,854.27</b>	<b>208.23</b>	<b>1,26,608.89</b>	<b>-129.74</b>	<b>61.39</b>

2011



2012



Longitude	83.04813 E
Latitude	18.13936 N
Area in Ha	2.88
Change	Negative
Compt No	510
Beat	Medaparthi
Range	Ananthagiri
Division	Vishakapatnam



## 4.20 CHITTOOR EAST WL DIVISION

### 4.20.1 Introduction:

Chittoor East WL Forest Division lies in the south of Andhra Pradesh and eastern Part of Chittoor District between latitudes 13° 1' 7.32" and 13° 55' 28.56" N and longitudes 78° 46' 50.88" and 80° 03' 10.44" E. The Geographical Area of the Division is 6,769.18 Km<sup>2</sup> which is 44.58 % of the area of the District. The Eastern Ghats are predominant in the western region and they gradually bend towards the sacred Sheshachalam hills of Tirupati, passing through Chandragiri, erstwhile taluk and entering into Nellore district. There is a plateau of average height of 800 M above MSL. The rivers flowing in the Division are non-perennial in nature. Important rivers in the Division are Bheema- a tributary of river Swarnamukhi, Pincha, Tumburkona, Kalangi, Arani and Ponnai.

Land use pattern of the Division is given in Table 4.20.1

The climate of this Division is healthy and pleasant. The temperatures range from 16°C to 46°C and the rain fall of the Division is received both from the South-West and North-East Monsoons. Annual rainfall is about 880 mm (average of past 12 years) and only 450 mm is received from the South-West Monsoon.

The major portion of the Division is covered by red loamy and sandy soils with portions of alluvial soil. The sandy loams constitute 55% of the soils in the Division; sandy clay loams 30% to 32%, clay soils 3% and the balance by Red clay soils and black sandy soils.

The population of the Division is 1.86 million (2001 Census), per capita forest area is 0.11 Ha. The Population density is 274 persons per Km<sup>2</sup>.

### 4.20.2 Recorded Forest Area:

The notified forest area of the Division is **2452.08 Km<sup>2</sup>** which is 36.22% of the geographical area. Reserved and Protected Forests constitute 1976.68 Km<sup>2</sup> (80.61%) and 475.4 Km<sup>2</sup> (19.39%) of the forest area respectively.

As per Champion and Seth's classification, the Forests of Division fall under Tropical Dry Mixed Deciduous Forests, Tropical Cutch Thorn Forest groups & Tropical Dry Evergreen Forest types.

### 4.20.3 Protected Area:

There is no Protected Area in the Division.

### 4.20.4 Community Forest Management:

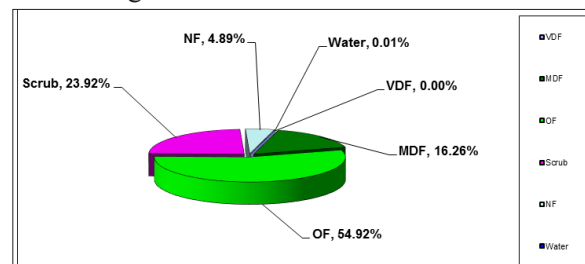
There are 225 Vana Samrakshana Samities (VSSs) in the Division. An area of 567.7 Km<sup>2</sup> forests, which constitutes 28.37 % of the notified forests, is under the management of the VSSs.

### 4.20.5 Forest Cover:

The forest cover in the Division based on the interpretation of IRS R2 LISS III 2012 data (Feb/Mar 2012) is **1343.02 Km<sup>2</sup>** which is **19.84%** of the Geographical area. In terms of the forest canopy density classes the Division has **0.00 Km<sup>2</sup>** of Very Dense Forest, **306.84 Km<sup>2</sup>** of Moderately Dense Forest and **1036.18 Km<sup>2</sup>** of Open

**Table 4.20.1: Land use Pattern**

Land use	Area in km <sup>2</sup>	Percentage
Forest including Scrub	1809.48	26.73
Agriculture	3371.05	49.80
Land with Scrub	903.77	13.35
Fallow Lands	299.68	4.43
Grasslands	30.62	0.45
Settlements	24.06	0.36
Vegetation outside forest	121.06	1.79
Water Bodies	209.45	3.09
<b>Total</b>	<b>6769.18</b>	



**Fig 4.20.1**





Forest. The area of the Scrub is **451.32 Km<sup>2</sup>**, Non-Forest **92.23 Km<sup>2</sup>** and Water Bodies **0.25 Km<sup>2</sup>**. 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 2011 and 2012 are shown in Figs 4.20.2 & 4.20.3 respectively and the changes between this period are shown on the image of 2012.

Comparison of the current forest cover with that of previous assessment year shows a **negative change of 21.16 Ha**. The forest cover change matrix given in Table 4.20.2 reveals that there has been a decrease of **21.16 Ha** open forest.

The total positive change (including scrub) is **315.62 Ha**. Out of this, **305.58 Ha** improvement is on account of growth in raised plantations and **10.04 Ha** is on account of improvement of forest due to protection and management interventions. The total negative change (including scrub) is **65.40 Ha**. Of this, **22.59 Ha** is on account of clearance of jungle growth for raising of plantations and the remaining **42.81 Ha** is on account of encroachment. As clearance of jungle growth for raising of plantations is forest management interventions, the same are not considered as loss of forest cover. Thus the negative change due to encroachments only are taken as loss of forest cover. Therefore, the net **loss of forest cover** in the Division is **176.37 Ha**.

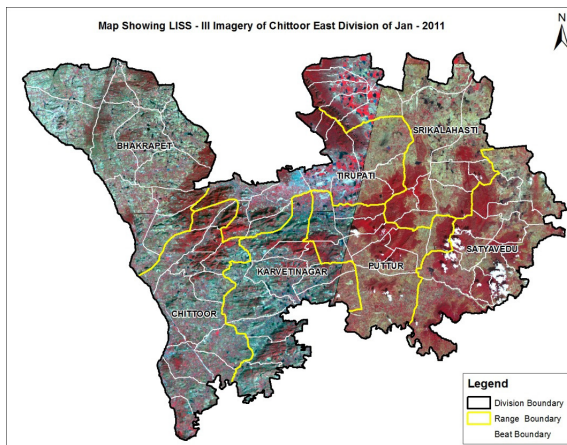


Fig 4.20.2

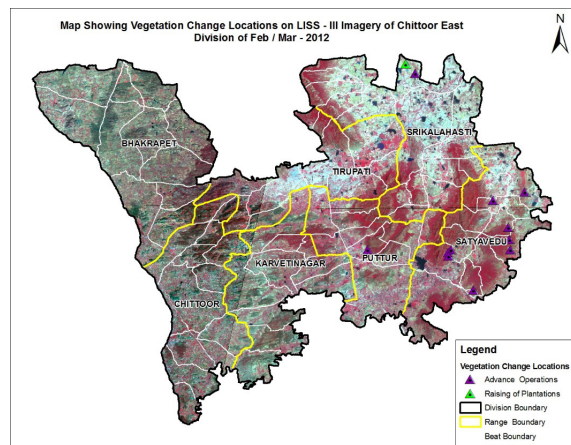


Fig 4.20.3

There are 78 Beats in the Division. Negative changes in forest cover are noticed in 5 Beats and Positive changes are in 9 Beats. There is no change in the remaining 64 Beats.

Details of forest cover changes in the 14 Beat mentioned above, is shown in Table 4.20.3

2011	2012						Total of 2011
	VDF	MDF	OF	SF	NF	Water	
Very Dense Forest	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Moderately Dense Forest	0.00	306.84	0.00	0.00	0.00	0.00	306.84
Open Forest	0.00	0.00	1034.20	0.21	0.00	0.00	1034.41
Scrub	0.00	0.00	1.98	449.93	0.44	0.00	452.35
Non-Forest	0.00	0.00	0.00	1.18	91.79	0.00	92.97
Water	0.00	0.00	0.00	0.00	0.00	0.25	0.25
<b>Total of 2012</b>	<b>0.00</b>	<b>306.84</b>	<b>1036.18</b>	<b>451.32</b>	<b>92.23</b>	<b>0.25</b>	<b>1886.82</b>
<b>Net Change</b>	<b>0.00</b>	<b>0.00</b>	<b>1.77</b>	<b>-1.03</b>	<b>-0.74</b>	<b>0.00</b>	



Table 4.20.3: List of Beats showing Forest Cover with changes								(Area in Ha)	
BEAT	VDF	MDF	OF	SF	NF	WB	Total	Encroachment	Net Change
<b>Bhakrapet Range</b>									
Ganugapenta	0	516.568	1672.175	491.57	157.756	6.995	2845.064	0.00	0.00
Mangalampet	0	410.339	2552.647	645.716	286.016	0	3894.718	0.00	0.00
Marella	0	8.495	73.818	1043.453	639.596	0	1765.362	0.00	0.00
Mellacheruvu	0	8.799	77.194	1213.831	289.578	0	1589.402	0.00	0.00
Peddamalla	0	1.937	390.287	920.035	149.847	0	1462.106	0.00	10.04
Pudipatlabailu	0	14.482	849.227	958.948	45.341	0	1867.998	0.00	0.00
Talapula	0	0	139.037	1929.012	796.356	0	2864.405	5.19	-5.19
Ustikayalapenta	0	21.271	314.397	2484.814	753.828	0	3574.31	0.00	0.00
Vagalla	0	6.843	277.038	1767.84	1078.889	0	3130.61	0.00	0.00
<b>Total</b>	<b>0</b>	<b>988.734</b>	<b>6345.82</b>	<b>11455.22</b>	<b>4197.207</b>	<b>6.995</b>	<b>22993.98</b>	<b>5.19</b>	<b>4.85</b>
<b>Chittoor Range</b>									
Bommasamudram	0	111.13	1030.12	264.737	17.277	0	1423.264	0.00	6.77
Chasses Hills	0	130.692	738.161	156.188	34.326	0	1059.367	9.29	-9.29
Chittoor	0	37.358	755.899	372.333	43.803	2.178	1211.571	0.00	0.00
Kasipentla	0	560.377	1317.614	97.534	61.179	0	2036.704	0.00	0.00
Mungilipattu	0	1076.883	1726.861	300.212	70.932	0	3174.888	0.00	0.00
Nendragunta	0	326.241	1947.198	203.02	16.979	0	2493.438	0.00	0.00
Oddepalli	0	347.758	1354.126	272.549	43.461	2.281	2020.175	0.00	0.00
Pachigunta	0	8.08	278.939	347.331	64.596	0	698.946	0.00	0.00
Panapakam	0	464.063	1947.929	174.497	24.154	0.76	2611.403	0.00	0.00
Pathagunta	0	523.838	1403.724	149.132	32.943	0	2109.637	0.00	0.00
Penumur	0	121.65	1047.625	412.8	56.185	0	1638.26	0.00	0.00
Puthalapattu	0	20.522	871.309	695.582	133.261	0	1720.674	13.86	-13.86
<b>Total</b>	<b>0</b>	<b>3728.592</b>	<b>14419.51</b>	<b>3445.915</b>	<b>599.096</b>	<b>5.219</b>	<b>22198.33</b>	<b>23.15</b>	<b>-16.38</b>
<b>Karvetinagar Range</b>									
Allamadugu	0	41.295	1521.553	1119.229	276.054	0	2958.131	0.00	0.00
Amudala	0	142.084	782.199	822.059	488.15	0	2234.492	0.00	0.00
G.v.puram	0	664.485	1047.214	622.862	212.021	0	2546.582	0.00	0.00
Karvetinagar	0	939.233	320.286	26.085	16.685	0	1302.289	0.00	0.00
Nissankadurgam	0	222.357	762.66	445.842	292.126	0	1722.985	0.00	0.00
Palasamudram	0	205.276	2653.664	848.938	155.192	0	3863.07	0.00	0.00
R.k.m.puram	0	1355.637	457.376	56.793	26.871	0	1896.677	0.00	0.00
Rayalacheruvu	0	668.902	785.367	306.875	96.061	0	1857.205	0.00	0.00
Srpuram	0	151.342	1803.611	831.49	266.081	0	3052.524	0.00	0.00
Surendranagar	0	510.046	682.511	120.618	15.15	0	1328.325	0.00	0.00
<b>Total</b>	<b>0</b>	<b>4900.657</b>	<b>10816.44</b>	<b>5200.791</b>	<b>1844.391</b>	<b>0</b>	<b>22762.28</b>	<b>0.00</b>	<b>0.00</b>
<b>Puttur Range</b>									
Battikandriga	0	1195.714	323.766	12.984	8.185	0	1540.649	0.00	0.00
Diguvaputtur	0	295.283	2184.683	1055.75	0	0	3535.716	0.00	0.00
Gullur Puttur	0	1303.442	580.18	53.081	19.294	0	1955.997	0.00	0.00
Nagari	0	45.25	886.252	2020.089	771.756	0	3723.347	0.00	-11.21
Padiredu Gollapalle	0	943.025	1216.521	202.382	46.878	3.434	2412.24	0.00	0.00
Palamangalam	0	17.556	1131.596	986.226	4.775	0	2140.153	0.00	0.00

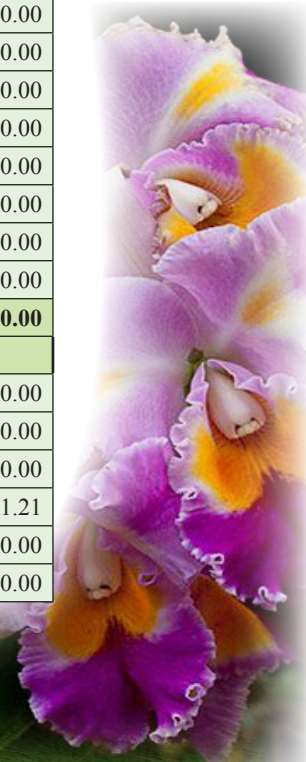
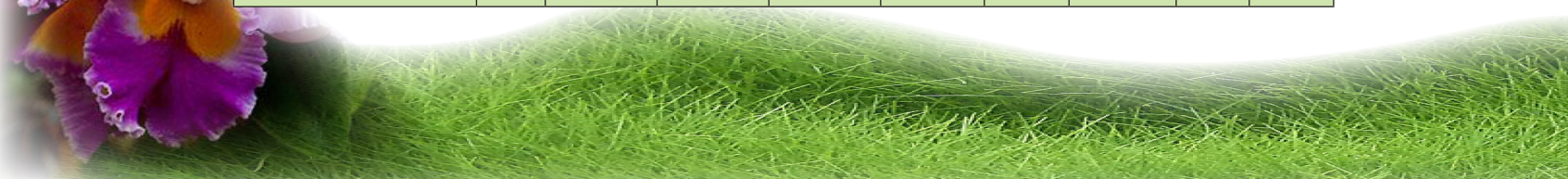
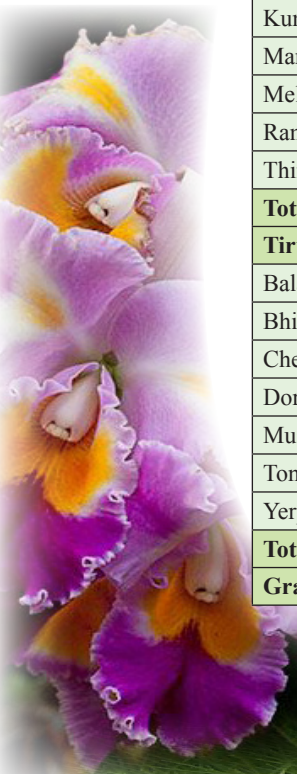




Table 4.20.3: List of Beats showing Forest Cover with changes								(Area in Ha)	
BEAT	VDF	MDF	OF	SF	NF	WB	Total	Encroachment	Net Change
Puttur Moolapalem	0	83.778	2011.047	755.92	5.669	0	2856.414	0.00	5.20
Taduku	0	470.214	1481.275	503.954	4.992	0.919	2461.354	0.00	9.49
Vadamalpet	0	1309.152	1531.837	355.116	76.405	1.912	3274.422	0.00	0.00
Vagathur	0	513.886	2344.714	392.352	15.226	0	3266.178	0.00	0.00
<b>Total</b>	<b>0</b>	<b>6177.3</b>	<b>13691.87</b>	<b>6337.854</b>	<b>953.18</b>	<b>6.265</b>	<b>27166.47</b>	<b>0.00</b>	<b>3.48</b>
<b>Satyavedu Range</b>									
Ambakam	0	764.659	4211.182	1084.39	2.632	0	6062.863	0.00	0.00
Bhupatheeswarapuram	0	165.121	3576.057	1032.627	23.316	0	4797.121	0.00	0.00
Kadur	0	28.738	862.069	1987.528	178.993	0	3057.328	7.79	11.92
Kambakam	0	323.444	3320.077	1080.677	39.985	0	4764.183	0.00	0.00
Nagalapuram	0	367.435	2913.472	615.411	5.599	0	3901.917	0.00	19.88
Nandanam	0	161.242	2616.51	783.278	0	0	3561.03	0.00	0.00
Pandur	0	58.129	1239.887	1402.916	50.006	0	2750.938	0.00	100.87
Pulikundram	0	392.477	2427.528	288.058	7.44	0	3115.503	0.00	7.66
S.k.madugu	0	194.321	2322.9	788.209	24.254	0	3329.684	0.00	0.00
Satyavedu	0	332.546	2389.978	426.838	56.13	0	3205.492	0.00	0.00
Vanallur	0	29.362	1649.886	624.638	14.467	0	2318.353	6.68	-5.94
<b>Total</b>	<b>0</b>	<b>2817.474</b>	<b>27529.55</b>	<b>10114.57</b>	<b>402.822</b>	<b>0</b>	<b>40864.41</b>	<b>14.47</b>	<b>134.39</b>
<b>Srikalahasti Range</b>									
Adavaram	0	236.537	2765.518	720.999	1.778	0	3724.832	0.00	0.00
Anjur	0	86.828	1373.911	922.158	57.191	0	2440.088	0.00	0.00
Chintalapalem	0	674.87	1326.902	330.243	147.235	0	2479.25	0.00	0.00
Kalathur	0	74.079	1655.649	597.01	53.823	0	2380.561	0.00	0.00
Kalavagunta	0	1478.451	1164.603	77.99	8.808	0	2729.852	0.00	0.00
Kandlur	0	274.774	2444.555	254.852	15.559	0	2989.74	0.00	0.00
Kasaram	0	0	384.26	636.512	204.654	0	1225.426	0.00	118.45
Katur	0	224.572	1170.118	511.324	6.084	0	1912.098	0.00	0.00
Kukkambakam	0	106.318	1243.676	922.357	29.174	0	2301.525	0.00	0.00
Kuntipudi	0	1606.601	843.847	101.329	22.965	0	2574.742	0.00	0.00
Mannavaram	0	633.868	1178.018	446.089	224.108	6.57	2488.653	0.00	0.00
Melachur	0	2036.454	1221.141	57.247	4.744	0	3319.586	0.00	0.00
Ramapuram	0	124.612	2071.566	436.163	0.509	0	2632.85	0.00	0.00
Thimmasamudram	0	328.278	1400.562	574.872	10.236	0	2313.948	0.00	0.00
<b>Total</b>	<b>0</b>	<b>7886.242</b>	<b>20244.33</b>	<b>6589.145</b>	<b>786.868</b>	<b>6.57</b>	<b>35513.15</b>	<b>0.00</b>	<b>118.45</b>
<b>Tirupati Range</b>									
Balakrishnanapuram	0	220.571	1510.213	415.341	17.555	0	2163.68	0.00	0.00
Bhimavaram	0	959.721	1975.111	211.57	64.931	0	3211.333	0.00	0.00
Chellur	0	720.24	1179.237	211.68	75.013	0	2186.17	0.00	0.00
Dornakambala	0	857.652	1581.75	118.851	110.816	0	2669.069	0.00	0.00
Musalipedu	0	200.058	1447.585	445.867	6.549	0	2100.059	0.00	0.00
Tondawada	0	524.387	1147.783	187.764	116.451	0	1976.385	0.00	0.00
Yerpedu	0	702.653	1727.747	397.74	47.901	0	2876.041	0.00	5.43
<b>Total</b>	<b>0</b>	<b>4185.282</b>	<b>10569.43</b>	<b>1988.813</b>	<b>439.216</b>	<b>0</b>	<b>17182.74</b>	<b>0.00</b>	<b>5.43</b>
<b>Grand Total</b>	<b>0</b>	<b>30684.28</b>	<b>103616.9</b>	<b>45132.31</b>	<b>9222.78</b>	<b>25.049</b>	<b>188681.4</b>	<b>42.81</b>	<b>250.22</b>



## 4.21 TIRUPATI WLM DIVISION

### 4.21.1 Introduction:

Tirupati WLM Division spreads over part of 2 districts, i.e., Chittoor and Kadapa. It lies in the southern part of Andhra Pradesh and north-eastern part of Chittoor district and south-eastern part of Kadapa district between latitudes 13° 36' 18" and 13° 56' 55.68" N and longitudes 79° 07' 51.96" and 79° 30' 18.36" E. Geographical area of the Division is 755.17 Km<sup>2</sup>.

Land use pattern of the Division is given in Table 4.21.1

**Table 4.21.1: Land use Pattern**

Land use	Area in Km <sup>2</sup>	Percentage
Forest including Scrub	689.81	91.34
Agriculture	0.00	0.00
Land with Scrub	3.82	0.51
Fallow Lands	35.73	4.73
Grasslands	0.00	0.00
Settlements	4.39	0.58
Vegetation outside forest	19.18	2.53
Water Bodies	2.31	0.31
<b>Total</b>	<b>755.17</b>	

The climate of this Division is generally dry with temperatures ranging from 19°C to 40°C and the annual rainfall is about 934 mm, received mainly from north-east monsoons.

Population of the Division is 0.38 million (2011 Census), per capita forest area is 0.18 Ha and the population density is 507 persons per Km<sup>2</sup>.

### 4.21.2 Recorded Forest Area:

The notified forest area of the Division is **714.33 Km<sup>2</sup>** which is 98.38% of the geographical area.

As per Champion and Seth's classification the forests of Division fall under Tropical Dry Mixed Deciduous Forests, Tropical Dry Deciduous Forests, Tropical Cutch thorn Forest & Tropical Dry Evergreen Forest types. Its most important species is the famous *Pterocarpus santalinus* or Red Sanders.

### 4.21.3 Protected Area:

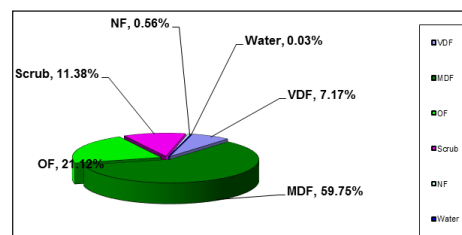
The Division consists of the Sri Venkateswara Wildlife Sanctuary and Sri Venkateswara National Park.

### 4.21.4 Community Forest Management:

There are 42 Vana Samrakshana Samities (VSSs) in the Division. An area of 107.44 Km<sup>2</sup>, which constitutes 15.04% of the notified forests, is under the management of the VSSs.

### 4.21.5 Forest Cover:

The forest cover in the Division based on the interpretation of IRS R2 LISS III 2012 data (NOV 2012) is **729.65 Km<sup>2</sup>** which is **96.62 %** of the geographical area. In terms of the forest canopy density classes the Division has **59.40 Km<sup>2</sup>** of Very Dense Forests, **495.20 Km<sup>2</sup>** of Moderately Dense Forests and **175.05 Km<sup>2</sup>** of Open Forest. The area of the Scrub is **94.28 Km<sup>2</sup>**, Non-Forests **4.65 Km<sup>2</sup>** and water Bodies **0.24 Km<sup>2</sup>**. 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:

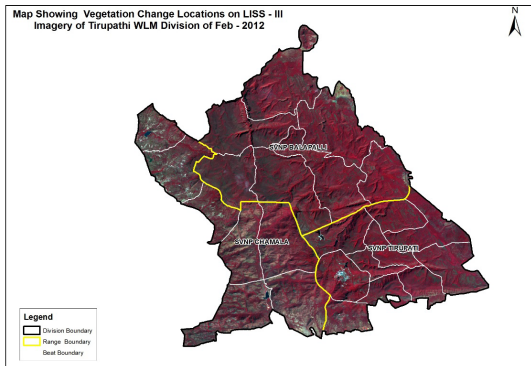
The satellite images of 2011 and 2012 seasons are shown in Figs 4.21.2 & 4.21.3 respectively and the changes between this period are shown on the image of 2011.

Comparison of the current forest cover with that of previous assessment year shows no **negative change** in forest. The forest cover change matrix given in Table 4.21.2

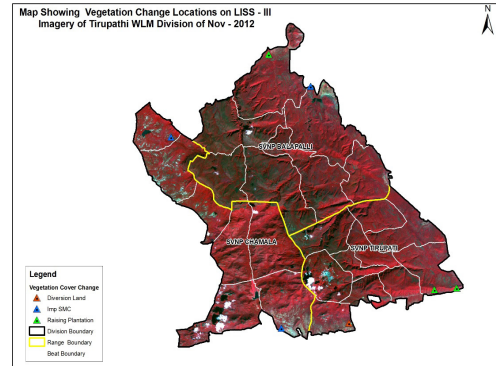
The total negative change (including scrub) is **17.97 Ha** is on account of clearance of jungle growth for raising of plantations. Positive change (including scrub) is **285.12 Ha**. **196.22 Ha** is an account of



growth in raised plantations and **88.90 Ha** is on account of improvement of forest due to protection and management interventions. As clearance of jungle growth for rising of plantations, harvesting of plantations and diversion of forest lands 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 cover is Nil**.



**Fig 4.21.2**



**Fig 4.21.3**

There are 25 Beats in the Division. Negative changes in forest cover is seen in only 1 Beat and positive changes in forest cover is seen in 5 Beats. There are no changes in the remaining 19 Beats.

Details of forest cover changes of Beats mentioned above is shown in Table 4.21.2.

Table 4.21.1: Forest Cover change matrix							(Area in Km <sup>2</sup> )	
2011	2012						Total of 2011	
	VDF	MDF	OF	SF	NF	Water		
Very Dense Forest	59.40	0.00	0.00	0.00	0.00	0.00	59.40	
Moderately Dense Forest	0.00	495.20	0.00	0.00	0.00	0.00	495.20	
Open Forest	0.00	0.00	172.44	0.00	0.00	0.00	172.44	
Scrub	0.00	0.00	2.53	94.04	0.18	0.00	96.75	
Non-Forest	0.00	0.00	0.08	0.24	4.47	0.00	4.79	
Water	0.00	0.00	0.00	0.00	0.00	0.24	0.24	
<b>Total of 2012</b>	<b>59.40</b>	<b>495.20</b>	<b>175.05</b>	<b>94.28</b>	<b>4.65</b>	<b>0.24</b>	<b>828.82</b>	
<b>Net Change</b>	<b>0.00</b>	<b>0.00</b>	<b>2.61</b>	<b>-2.47</b>	<b>-0.14</b>	<b>0.00</b>		

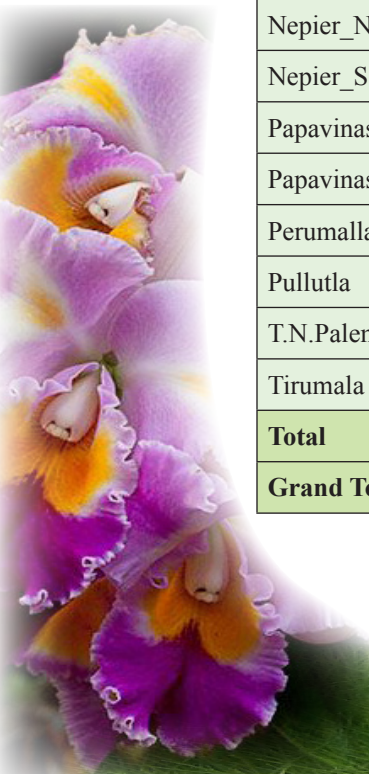


Table 4.21.2: List of Beats showing Forest Cover with changes								(Area in Ha)
BEAT	VDF	MDF	OF	SF	NF	WB	Total	Net Change
<b>SVNP Balapalli Range</b>								
Arimanibanda	357.297	1402.648	45.914	8.314	0.000	0.000	1814.173	0.00
Balapalli	321.506	984.704	70.452	94.876	3.101	0.000	1474.639	0.00
Desettipalli_C	46.703	1265.531	85.805	30.032	3.401	0.000	1431.472	0.00
Desettipalli_N	110.234	1095.995	387.165	164.963	10.926	0.000	1769.283	3.09
Desettipalli_S	49.113	702.289	180.911	25.042	4.353	0.000	961.708	0.00
Gundampenta	24.316	670.347	701.08	68.041	16.902	0.000	1480.686	0.00
Gunjana	172.924	1839.054	279.766	387.95	35.738	1.734	2717.166	7.85
Janaratikuppa	95.573	728.58	156.834	22.284	0.000	0.000	1003.271	0.00
Kangimadugu_N	183.13	1542.341	37.36	8.452	0.000	0.000	1771.283	0.00
Kangimadugu_S	190.652	1340.287	128.618	18.549	0.000	0.000	1678.106	0.00
Kukkaladoddi	483.252	1009.975	27.512	12.462	0.000	0.000	1533.201	0.00
Mogilipenta_N	53.15	1310.364	275.601	17.349	0.000	0.000	1656.464	0.00
Mogilipenta_S	54.127	691.841	243.265	95.657	0.000	0.000	1084.89	0.00
Mogilipenta_W	17.366	839.985	734.664	42.174	0.000	0.000	1634.189	0.00
Nemiligundala	36.235	721.764	812.849	29.576	17.948	0.000	1618.372	0.00
Netikuppa	112.573	1084.937	45.016	10.065	0.000	0.000	1252.591	0.00
Papanasanam_N	16.079	859.045	984.605	56.117	0.000	0.000	1915.846	0.00
Papanasanam_S	9.038	543.635	649.323	119.326	0.000	0.000	1321.322	0.00
Pottirajupalli	30.903	738.525	201.167	93.867	1.283	0.000	1065.745	0.00
Uudumulakonda	93.27	1347.03	299.154	6.233	0.000	0.000	1745.687	0.00
<b>Total</b>	<b>2457.441</b>	<b>20718.88</b>	<b>6347.061</b>	<b>1311.329</b>	<b>93.652</b>	<b>1.734</b>	<b>30930.09</b>	<b>10.94</b>
<b>SVNP Chamala Range</b>								
Bhakarapet	0	461.597	623.513	773.574	9.563	0.000	1868.247	0.00
Chamala_E	56.774	1884.59	603.338	172.912	0.634	0.000	2718.248	0.00
Chamala_W	25.568	588.757	480.299	461.6	0.000	0.000	1556.224	0.00
Devarakonda_N	0	617.731	267.836	156.369	8.838	0.000	1050.774	0.00
Devarakonda_S	15.187	792.841	406.493	294.399	14.181	0.000	1523.101	0.00
Kalyani	5.276	996.444	570.029	322.073	0.000	0.000	1893.822	0.00
Nagapatla_N	5.074	603.444	606.787	547.478	39.675	0.000	1802.458	0.00
Nagapatla_S	4.271	770.52	666.537	700.097	6.289	0.000	2147.714	0.00





Table 4.21.2: List of Beats showing Forest Cover with changes								(Area in Ha)
BEAT	VDF	MDF	OF	SF	NF	WB	Total	Net Change
Nelakona	5.976	535.918	325.275	122.948	13.972	0.000	1004.089	0.00
Nerabailu	9.564	300.931	528.3	349.159	27.611	0.000	1215.565	0.00
Palakonda	31.309	1162.159	285.072	43.865	0.000	0.000	1522.405	0.00
Pulibonu	1.96	735.031	680.576	365.417	0.525	0.000	1783.509	0.00
Rangampet	15.298	591.587	664.484	692.994	31.786	0.000	1996.149	57.10
Subbarama Puram	11.99	631.077	464.172	244.617	11.029	0.000	1362.885	0.00
Talakona_N	4.703	482.051	665.626	792.641	35.416	22.760	2003.197	23.95
Talakona_S	3.637	376.057	564.831	839.423	65.361	0.000	1849.309	0.00
<b>Total</b>	<b>196.587</b>	<b>11530.74</b>	<b>8403.168</b>	<b>6879.566</b>	<b>264.880</b>	<b>22.760</b>	<b>27297.7</b>	<b>81.05</b>
<b>SVNP Tirupathi Range</b>								
Alipiri	58.522	708.686	105.206	68.776	2.377	0.000	943.567	0.00
Anjaneyapuram	242.828	1013.487	60.022	29.244	1.047	0.000	1346.628	0.00
Kapilatheertham	102.102	967.303	51.84	73.777	0.634	0.000	1195.656	0.00
Karakambadi_N	85.742	1354.292	167.931	40.816	0.000	0.000	1648.781	0.00
Karakambadi_S	33.293	707.787	272.099	167.626	175.619	0.000	1356.424	193.13
Kentimadugu	435.938	911.425	30.623	8.245	0.000	0.000	1386.231	0.00
Krishnapuram	171.866	1242.793	204.911	112.704	9.684	0.000	1741.958	0.00
Mamandur_C	266.826	1050.772	80.741	26.059	0.000	0.000	1424.398	0.00
Mamandur_N	329.812	1404.82	139.045	66.493	0.000	0.000	1940.17	0.00
Mamandur_S	234.023	1070.821	150.134	33.414	0.000	0.000	1488.392	0.00
Nepier_N	227.976	750.838	45.085	46.423	12.115	0.000	1082.437	0.00
Nepier_S	491.331	723.118	91.314	30.332	0.000	0.000	1336.095	0.00
Papavinasanam_E	171.319	1116.891	153.034	7.136	10.525	0.000	1458.905	0.00
Papavinasanam_W	32.079	670.734	273.113	85.407	36.981	0.000	1098.314	0.00
Perumallapalli	27.342	628.033	433.581	291.848	26.180	0.000	1406.984	-17.97
Pullutla	244.18	1230.126	66.112	6.023	0.000	0.000	1546.441	0.00
T.N.Palem	22.093	889.561	169.94	132.938	0.645	0.000	1215.177	0.00
Tirumala	108.352	829.133	90.703	9.15	0.000	0.000	1037.338	0.00
<b>Total</b>	<b>3285.624</b>	<b>17270.62</b>	<b>2585.434</b>	<b>1236.411</b>	<b>275.807</b>	<b>0.000</b>	<b>24653.9</b>	<b>175.16</b>
<b>Grand Total</b>	<b>5939.652</b>	<b>49520.23</b>	<b>17335.66</b>	<b>9427.306</b>	<b>634.339</b>	<b>24.494</b>	<b>82881.69</b>	<b>267.15</b>



## 4.22 RAJAMPET WLM DIVISION

### 4.22.1 Introduction:

Rajampet WL Forest Division lies in the south-eastern part of Kadapa district between latitudes 13° 46' 45" and 14° 23' 35" N and longitudes 78° 44' 44" and 79° 28' 22" E. Geographical area of the Division is 3,027 Km<sup>2</sup> which is 19.71% of the geographical area of the district. The Division is having an altitude of 378.7 M. The rivers viz., Penna, Chitravathi, Kundu, Papaghni, Sagileru, Mandvya, Gunjaneru and Cheyyeru fall in this 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 25°C to 40°C and the annual rainfall is about 700 mm with uneven isolated rains received mainly from south-west monsoons.

The soils of the Division are red ferruginous and black. These two classes can be sub divided into clay & loamy sand with finer distinctions. They range from poor to fertile. Red soils occupy most of the area and are under cultivation. These soils have a low nutrient status. The minerals like Barites, China clay, White clay, Copper, Manganese Black Granite and Lime stone are available.

Population of the Division is 0.49 million (2011 Census), per capita forest area is 0.3 Ha and the population density is 148 persons per Km<sup>2</sup>.

### 4.22.2 Recorded Forest Area:

The notified forest area of the Division is **1437.03 Km<sup>2</sup>** which is 47.47% of the geographical area. Reserved and Un-classed forests constitute 1,410.71 Km<sup>2</sup> (98.17%) and 26.32 Km<sup>2</sup> (1.83%) of the forest area respectively.

As per Champion and Seth's classification, the forests of the Division falls under Tropical dry deciduous forest type. The most important species is the famous *Pterocarpus santalinus* or Red Sanders. These forests fall under three zones; those of Terai or Fuel Forests up to an elevation of 250 M, hill forests or Red Sanders lying between the elevation of 250 - 700 M and *Shorea Eugenia* occupying elevations above 700 M feet.

### 4.22.3 Protected Area:

A part of Sri Penusila Narasimha Swamy WLS falls in this Division.

### 4.22.4 Community Forest Management:

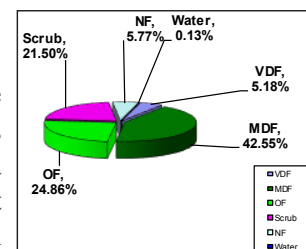
There are 178 Vana Samrakshana Samities (VSSs) in the Division. An area of 445.55 Km<sup>2</sup> of forests, which is 31% of the notified forests, is under the management of the VSSs.

### 4.22.5 Forest Cover:

The forest cover in the Division is based on the interpretation of IRS R2 LISSIII 2012 Data (NOV 2012) is **1053.86 Km<sup>2</sup>** which is **34.81%** of the geographical area. In terms of the forest canopy density classes the Division has **75.22 Km<sup>2</sup>** of very Dense Forest and **617.86 Km<sup>2</sup>** of moderately dense. The area of the open forest is **360.91 Km<sup>2</sup>**, scrub **312.21 Km<sup>2</sup>**, **83.83 Km<sup>2</sup>** of non forest and Water Bodies **1.91 Km<sup>2</sup>**. The distribution of the forest cover of the Division is shown in Fig 4.22.1.

**Table 4.22.1: Land use Pattern**

Land use	Area in Km <sup>2</sup>	Percentage
Forest including Scrub	1397.35	46.16
Agriculture	845.79	27.94
Land with Scrub	185.17	6.12
Fallow Lands	382.88	12.65
Grasslands	6.00	0.20
Settlements	7.65	0.25
Orchids	158.72	5.24
water bodies	43.43	1.43
<b>Total</b>	<b>3027.00</b>	



**Fig 4.22.1**



#### 4.22.6 Change in Forest Cover:

The satellite images of 2011 and 2012 seasons are shown in Figs 4.22.2 & 4.22.3 respectively and the changes between this periods are shown on the image of 2012.

Comparison of the current forest cover with that of previous assessment year shows a **negative change** in forest cover of **30.49 Ha** positive cover change **13.42 Ha**. The Forest cover change matrix given in Table 4.22.2 shows that there is a decrease of **30.49 Ha** of open forest and net change of **72.18 Ha** of scrub.

The total positive change (including scrub) is **78.13 Ha**. Out of this, **67.51 Ha** is on account of raising plantations and **10.62 Ha** is on account of improvement of forest due to protection and management interventions. The total negative change (including scrub) is **149.34 Ha**. Of this, **61.46 Ha** is on account of clearance of jungle growth for adv operations, **78.82 Ha** is on account of encroachment and **9.06 Ha** is on account of failure plantations. As raising of plantations is a forest management intervention, the same is not considered as loss of forest cover. Therefore the **net loss of forest cover is 78.82 Ha** in the Division.

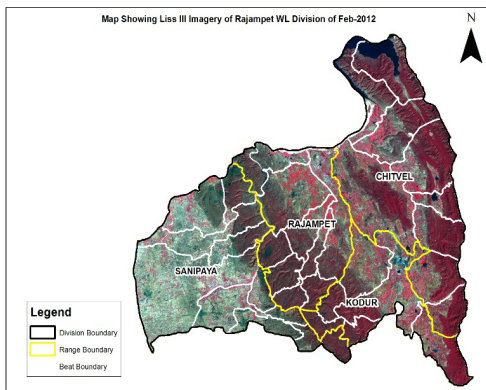


Fig 4.22.2

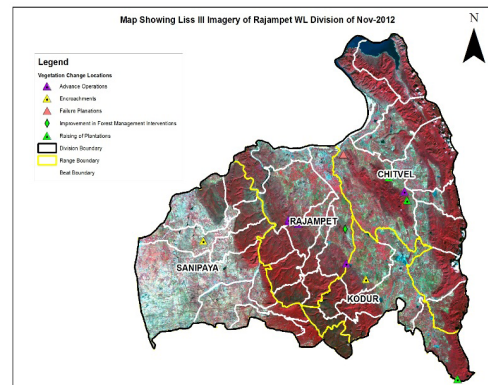


Fig 4.22.3

There are 32 Beats in the Division. Negative changes in forest cover are noticed in 6 Beat and Positive changes in forest cover are noticed in 2 Beats only. There are no changes in the remaining 24 Beats.

Details of forest cover changes in the 8 Beats mentioned above along with other beats are shown in Table 4.22.3.

Table 4.22.2: Forest Cover change matrix							(Area in Km <sup>2</sup> )
2011	2012						Total of 2011
	VDF	MDF	OF	SF	NF	Water	
Very Dense Forest	75.22	0.00	0.00	0.00	0.00	0.00	75.22
Moderately Dense Forest	0.00	617.86	0.00	0.00	0.00	0.00	617.86
Open Forest	0.00	0.00	360.78	0.18	0.12	0.00	361.08
Scrub	0.00	0.00	0.13	311.38	1.19	0.00	312.70
Non-Forest	0.00	0.00	0.00	0.65	82.52	0.00	83.17
Water	0.00	0.00	0.00	0.00	0.00	1.91	1.91
<b>Total of 2012</b>	<b>75.22</b>	<b>617.86</b>	<b>360.91</b>	<b>312.21</b>	<b>83.83</b>	<b>1.91</b>	<b>1451.94</b>
<b>Net Change</b>	<b>0.00</b>	<b>0.00</b>	<b>-0.17</b>	<b>-0.49</b>	<b>0.66</b>	<b>0.00</b>	



Table 4.22.3: List of Beats showing Forest Cover with changes								(Area in Ha)	
BEAT	VDF	MDF	OF	SF	NF	WB	Total	Encroachment	Net Change
<b>Chitvel Range</b>									
Chitvel	805.88	5236.74	1519.88	952.89	45.32	0.00	8560.71	0.00	35.09
Chukkavaripalli	0.89	1757.93	1243.45	555.52	39.92	1.43	3599.13	0.00	0.00
Kondur	308.87	2541.41	377.65	164.96	39.01	0.00	3431.90	0.00	0.00
Kottur	106.58	5255.47	1093.91	254.61	38.35	186.35	6935.27	0.00	0.00
R.V.Palli	746.05	3970.00	272.32	111.66	2.44	0.00	5102.47	0.00	0.00
Rajukunta	1202.41	7011.71	613.17	373.92	29.76	0.00	9230.97	0.00	0.00
Salivendala	304.33	2413.33	115.58	46.53	5.06	0.00	2884.83	0.00	0.00
V.R.Palli	656.62	5578.62	374.12	216.01	37.58	1.41	6864.36	0.00	0.00
<b>Total</b>	<b>4131.62</b>	<b>33765.20</b>	<b>5610.09</b>	<b>2676.10</b>	<b>237.43</b>	<b>189.18</b>	<b>46609.63</b>	<b>0.00</b>	<b>35.09</b>
<b>Kodur Range</b>									
Balapalli East	1836.04	2137.06	130.54	143.15	24.96	0.66	4272.41	0.00	7.63
Chiyyavaram	1094.60	2972.96	24.94	8.45	3.85	0.00	4104.80	0.00	0.00
Gadela	44.92	2074.14	1343.91	147.74	9.95	0.00	3620.66	0.00	0.00
K.V.Bhavi_North	184.69	3428.77	622.69	389.65	63.93	0.00	4689.72	0.00	0.00
K.V.Bhavi_South	118.27	2624.24	477.92	88.69	16.26	0.00	3325.38	0.00	0.00
M.Bhavi	13.08	812.55	1449.23	1032.72	55.20	0.00	3362.78	20.77	-20.77
N.G.Penta	9.02	1511.68	1363.36	81.35	0.00	0.00	2965.42	0.00	0.00
<b>Total</b>	<b>3300.63</b>	<b>15561.39</b>	<b>5412.58</b>	<b>1891.77</b>	<b>174.13</b>	<b>0.66</b>	<b>26341.16</b>	<b>20.77</b>	<b>-13.14</b>
<b>Rajampet Range</b>									
Annasamudram	37.59	1289.75	2240.91	1963.15	146.59	0.00	5677.99	0.00	-7.42
Arimanipenta	2.18	937.01	2106.20	242.41	1.46	0.00	3289.26	0.00	0.00
B.D.Bhavi	27.77	1948.18	1655.27	238.72	18.22	0.00	3888.17	0.00	0.00
C.C.Kunta	1.42	1044.23	1494.51	852.34	39.35	0.00	3431.84	0.00	-15.24
Renuthala	4.49	158.32	1209.13	2659.11	176.60	0.86	4208.50	0.00	0.00
Rollamadugu	1.74	1192.01	2668.16	840.21	119.30	0.00	4821.41	0.00	0.00
S.R.Palem	2.49	894.61	1859.78	2091.13	67.50	0.00	4915.51	0.00	-12.45
T.Bailu	3.42	1049.46	3239.04	787.41	18.71	0.00	5098.03	0.00	0.00
Vattalur	4.98	679.08	1089.09	332.96	2.89	0.00	2109.00	0.00	0.00
<b>Total</b>	<b>86.06</b>	<b>9192.65</b>	<b>17562.08</b>	<b>10007.44</b>	<b>590.61</b>	<b>0.86</b>	<b>37439.71</b>	<b>0.00</b>	<b>-35.11</b>
<b>Sanipaya Range</b>									
Dinnela	2.79	2271.80	1796.95	1438.79	14.42	0.00	5524.74	0.00	0.00
Jandrapenta	0.00	195.46	1462.34	1722.17	347.59	0.00	3727.56	0.00	0.00
Jillelamanda	0.40	7.29	50.16	2294.95	274.16	0.00	2626.96	0.00	0.00
Mudumpadu	0.00	154.12	460.64	1569.73	202.47	0.00	2386.95	0.00	0.00
Sanipaya	0.00	269.28	1394.87	2137.06	1425.84	0.00	5227.04	24.52	-24.52
T.Sundupalli	0.83	176.14	816.17	3326.64	3580.46	0.00	7900.24	33.53	-33.53
Vanarachapalli	0.00	188.14	1514.70	1461.43	257.03	0.00	3421.29	0.00	0.00
Veeraballi	0.00	4.13	10.70	2694.14	1279.17	0.00	3988.14	0.00	0.00
<b>Total</b>	<b>4.02</b>	<b>3266.34</b>	<b>7506.52</b>	<b>16644.91</b>	<b>7381.14</b>	<b>0.00</b>	<b>34802.92</b>	<b>58.05</b>	<b>-58.05</b>
<b>Grand Total</b>	<b>7522.33</b>	<b>61785.58</b>	<b>36091.28</b>	<b>31220.22</b>	<b>8383.31</b>	<b>190.70</b>	<b>145193.40</b>	<b>78.82</b>	<b>-71.21</b>





## 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 Bio-Diversity 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 Andhra Pradesh state has coastline of about 974 km. The State has wide and varied vegetation types enriched by a variety of flora and fauna. Andhra Pradesh being located strategically in the central region of the Indian sub-continent has representatives of the magnificent Indian plant and animal life. Its varied topography ranging from the hills of Eastern Ghats and Nallamallais to the shores of Bay of Bengal supports varied ecotypes, which in turn 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 hills of Eastern Ghats add greatly to the biological diversity and provide centers of endemism for plants, birds and lesser forms of animal life. 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. The long sea coast provides the nesting ground for sea turtles, the back waters of Pulicat Lake are the feeding grounds for Flamingoes and Grey Pelicans. The estuaries of river Godavari and Krishna support rich mangrove forests with Fishing Cat and Otters as keystone species. The State is a proud possessor of some rare and endemic plants like *Cycas beddomei*, *Pterocarpus santalinus*, *Terminalia pallida*, *Syzygium alternifolium*, *Shorea talura*, *Shorea tumbergia*, *Psilotum nudam* etc. Similarly, the Double banded or the Jerdon's Courser, the Golden Gecko and the Slender Loris are rare, endangered and endemic fauna in the State.

### 5.2. Protected Area Network in AP

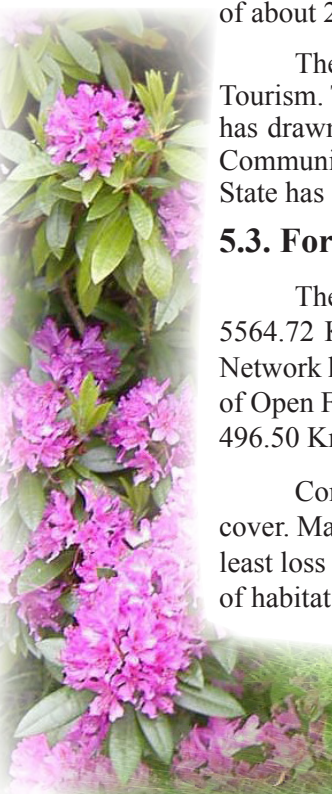
The State has 16 Protected Areas – 3 National Parks , 13 Wildlife Sanctuaries, which includes one Tiger Reserves i.e. Nagarjuna Sagar – Srisailem Tiger Reserve (NSTR), the biggest Tiger Reserve of India. Out of 36914.77 Km<sup>2</sup> of notified forest area, 8137.08 Km<sup>2</sup> is included in the PA network, covering an area of about 22.04% of the notified forests and 5.00 % 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 IRS P6 LISS III 2011 data is 5564.72 Km<sup>2</sup>, i.e. 3.42 % of the Geographical area. In terms of the forest canopy density classes the PA Network has 172.09 Km<sup>2</sup> of Very Dense Forest, 2768.48 Km<sup>2</sup> of Moderately Dense Forest and 2624.15 Km<sup>2</sup> of Open Forests. The area of the Scrub included is 1243.69 Km<sup>2</sup>, Non-Forest 832.18 Km<sup>2</sup> and Water Bodies 496.50 Km<sup>2</sup>.

Comparison of the forest cover of 2012 with that of 2011 shows a net loss of 0.20 Km<sup>2</sup> of forest cover. Maximum habitat loss of 0.18 Km<sup>2</sup> has occurred in Lankamalleswara Wild Life Sanctuary and the least loss of 0.02 Km<sup>2</sup> in Kambalakonda sanctuary. There is no net gain in any sanctuary. There is no loss of habitat (forest cover) in the remaining 13 WLSs.



Protected Area wise forest cover in different forest canopy density classes along with the changes compared to 2011 assessment is given in **Table 5.1**.

**Table 5.1. Protected areas Forest Cover -2012**

**Area in Km<sup>2</sup>**

S.No.	Sanctuary	VDF	MDF	OF	Net Change	SF	NF	WB	Total	Encroachment
1	GBM	2.74	548.21	385.14	0.00	204.52	3.48	2.01	1146.11	0.00
2	KAMBALAKONDA	0.00	16.88	46.20	-0.02	13.39	3.47	0.05	79.99	0.02
3	KOLLERU	<b>This Sanctuary is out of RF</b>								
4	KORINGA	5.37	105.62	8.03	-0.02	1.01	5.98	123.64	249.65	0.00
5	KOUNDINYA	7.16	601.60	231.41	0.64	-47.12	22.37	0.23	815.65	0.00
6	KRISHNA	0.00	0.00	82.70	0.00	72.04	51.87	111.52	318.14	0.00
7	LANKAMALLESWARA	2.58	101.02	337.26	-0.08	46.26	18.47	0.00	505.60	0.18
8	NELAPATTU	0.00	0.01	4.88	0.00	2.57	2.11	0.00	9.57	0.00
9	NSTR	1.10	100.55	480.81	0.00	815.52	77.07	3.49	1478.54	0.00
10	PAPIKONDA	110.56	673.15	52.11	0.00	11.46	5.43	3.21	855.92	0.00
11	PENUSILA	42.56	578.25	480.69	0.00	32.95	102.37	34.40	1271.22	0.00
12	PULICATLAKE	0.00	0.87	36.16	0.00	37.69	466.18	215.97	756.88	0.00
13	RAJIVGANDHI-NP	0.01	0.05	0.78	0.00	2.80	0.17	0.02	3.82	0.00
14	ROLLAPADU	0.00	0.01	0.02	0.00	0.17	4.88	0.13	5.21	0.00
15	SVNP	0.00	42.23	479.01	0.60	48.30	69.40	1.84	640.78	0.00
<b>TOTAL</b>		<b>172.09</b>	<b>2768.48</b>	<b>2624.15</b>	<b>1.13</b>	<b>1243.69</b>	<b>832.18</b>	<b>496.50</b>	<b>8137.08</b>	<b>0.20</b>

**\*\* Water Bodies inclusive of outside notified forests in Pulicat & Kolleru Lake, Koringa WLS etc.**

**\*Net Change in Forest Cover means change from, VDF, MDF and OF to Scrub and Non-Forest between 2011 and 2012.**





## Chapter - VI

# Forest Cover Statistics in Joint Forest Management Areas

### 6.1. Introduction

Andhra Pradesh is one of the pioneering Forest Departments in India in implementation of the Community Forest Management (CFM). Joint Forest Management (JFM) was introduced in AP in 1994 for protecting forests, to improve their productivity and to alleviate rural poverty in consonance with the National Forest Policy 1988 and GOI circular of June 1990 on people's participation in forest management. This strategy had mixed results 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 Andhra Pradesh adopted a proactive stance by transforming JFM into CFM during 2002.

The difference between JFM and CFM is that 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 and at the same time redefining roles of APFD frontline staff to act as facilitators. It is important to note that 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.

### 6.2. Area under VSSs

There are 4,419 Vana Samrakshana Samities (VSSs) or JFPCs and 116 EDCs in the State. 8426.11 Km<sup>2</sup> forest areas which constitutes 22.8 % of forest area, is under CFM.

### 6.3. Forest Cover in VSS Areas

The forest cover in the VSS areas based on the interpretation of IRS P6 LISS III 2012 data is 4724.71 Km<sup>2</sup>, which is 2.91% of the Geographical area. In terms of the forest canopy density classes the VSSs managed forests in the State consists of 65.08 Km<sup>2</sup> of Very Dense Forest, 2259.78 Km<sup>2</sup> of Moderately Dense Forest and 2399.85 Km<sup>2</sup> of Open Forest. The area of the Scrub is 2402.73 Km<sup>2</sup>, Non-Forest is 1282.60 Km<sup>2</sup> and Water Bodies is 16.06 Km<sup>2</sup>.

Comparison of the forest cover of 2012 with that of 2011 shows a net loss of 2.80 Km<sup>2</sup> of forest cover. It is seen that contribution of encroachments in the loss of forest cover in VSS areas is 1.74 Km<sup>2</sup>.

Division wise forest cover in VSSs in different forest canopy density classes along with the changes compared to 2011 assessment is given in **Table 6.1**.



**Table 6.1: Division wise Forest Cover change in VSS areas IN 2011-2012**

**(Area in Km<sup>2</sup>)**

S.No	Division	VDF	MDF	OF	Net Change (2011-2012)	SF	NF	WB	Total	Net change SF to NF (2011-2012)
1	ANANTHAPUR	0.00	0.45	8.65	0.00	222.42	396.53	0.30	628.36	-0.73
2	CHITTOOR WEST	6.37	270.65	143.25	0.54	27.45	14.66	0.12	463.04	-0.67
3	ATMAKUR	0.00	9.55	26.56	0.00	41.44	57.49	0.27	135.31	0.00
4	MARKAPUR	0.44	24.02	178.33	0.00	191.51	5.15	0.00	399.46	-0.12
5	GIDDALUR	0.14	21.93	112.79	0.00	132.38	19.63	0.20	287.08	-0.50
6	GUNTUR	0.00	15.25	35.20	0.00	189.44	20.51	0.41	260.81	-1.29
7	NELLORE	0.84	48.31	121.90	-0.04	366.91	102.84	5.14	645.90	-1.97
8	KADAPA	0.17	6.31	182.43	0.00	176.78	28.40	0.00	394.09	-0.13
9	KURNOOL	0.00	0.04	49.17	0.00	140.48	202.85	0.09	392.63	0.00
10	NANDYAL	0.29	60.13	90.50	0.49	13.00	2.45	0.45	167.31	3.07
11	PRODDUTUR	0.14	3.27	237.13	-0.37	201.81	12.86	1.15	456.00	-0.10
12	WEST GODAWARI	11.25	285.14	30.30	-3.02	58.71	28.61	0.53	411.53	-0.14
13	EAST GODAWARI	21.94	764.81	267.10	-1.37	9.33	78.86	6.01	1146.68	-0.53
14	VIJAYAWADA	0.00	0.05	38.87	-0.04	38.37	3.29	0.80	81.34	-0.11
15	NARSIPATNAM	9.53	144.30	42.40	0.06	13.13	21.76	0.00	231.18	-0.01
16	PADERU	0.27	54.68	141.59	-0.05	78.69	4.51	0.06	279.75	-0.15
17	SRIKAKULAM	0.00	2.41	75.87	-0.04	138.41	73.26	0.25	290.17	-0.18
18	VIJAYANAGARAM	0.00	132.45	131.10	-0.14	32.56	18.81	0.01	314.79	0.00
19	VISAKHAPATNAM	0.09	114.23	113.41	-0.11	38.13	6.01	0.07	271.84	-0.15
20	CHITTOOR EAST	0.00	70.30	290.76	1.08	150.13	31.84	0.08	544.18	-0.02
21	WLM TIRUPATHI	4.46	53.46	37.50	1.84	35.09	1.52	0.01	133.88	0.24
22	RAJAMPET	8.58	49.73	60.88	-0.09	113.88	55.86	0.00	288.85	-0.27
23	Khammam part	0.57	128.32	32.16	-1.54	26.04	13.54	0.02	199.11	0.41
	<b>Total</b>	<b>65.08</b>	<b>2259.81</b>	<b>2447.87</b>	<b>-2.80</b>	<b>2436.11</b>	<b>1201.25</b>	<b>15.99</b>	<b>8423.31</b>	<b>-3.35</b>

**The 15 VSSs where the most loss of forest cover was noticed (VDF,MDF, OF,SC) are:**

Inkurthi (Nellore), Manubolupadu (Nellore), Kollapanaidupalli (Nellore), Chandragud (Krishna), Chintampalli (Eluru), Achampally (Ananthapur), Bhogolu (Eluru), Kolluvarigudem (Eluru), Vayyada (Kakinada), Cherupally (Khammam 7 districts area), Kalijolla(Ui) (Kakinada), A Polavaram (Eluru), Veerapuram (Khammam 7 districts area), M.P.Thanda (Nandyal) and Chikativaripalli (Proddutur).

**The 15 VSSs, where the forest cover was gained most (VDF, MDF, OF, Scrub) are:**

N.R.Kunta (Nandyal), K.P.Thanda (Nandyal), Kondrajupalli (Chittoor E), Venkatapuram (WLM-Tirupathi), Kolluvarigudem (Eluru), Pandirlapalli (Nandyal), Musalimadugu (Chittoor west), Peddakambalur (Nandyal), Nakalapally (WLM-Rajampet), S.V Puram (WLM-Tirupathi), Suchetha Nagar (Nellore), Puttupalli (Nandyal), Uyyalapalli (Nellore), Kuchivanipalli (WLM-Tirupathi) and Uayagiri ST Colony (Nellore).





## Chapter – VII

# Forest Fires In Andhra Pradesh

**7.1 Introduction** - Forests face many hazards but the most common hazard is forest fire. Forest fires are as old as the forests themselves. They pose a threat not only to the forest wealth but also to the entire regime of fauna and flora seriously disturbing the bio-diversity, the ecology and environment of a region. During summer, when there is no rain for months, the forests become littered with dry senescent leaves and twigs, which would burst into flames ignited by the slightest spark. And thus the inevitable does happen.

Forest fires can be either natural or manmade and caused by heat generated in the litter and other biomes in summer through carelessness of people (human neglect). Sometimes, forest fires are purposely caused by local inhabitants.

There is unanimous opinion that the forest fires are to be controlled if not completely eliminated. For last several decades attempts have been made to prevent forest fires but the success was to a limited extent. Andhra Pradesh has an area of about 36,914.69 square kilometers of forest land (after bifurcation of the state on 02.06.2014) under the control of Forest Department. Out of the above, excluding an area of about 350 square kilometers of mangrove vegetation, the rest of the forest area is prone to fires. The fires occurring in Andhra Pradesh (AP) are only ground fires in nature. However in recent fire of March 2014 in Tirumala Hills crown fire was seen over large area. The ground fire or surface fire mostly occur between February and May in the state as seen from MODIS satellite images. March is the most susceptible month for the forest fires. The ground fire cause wide spread damage to the ground flora and fauna. The young regeneration is seriously affected by the fire. There are no two opinions that elimination of forest fire, which is mostly manmade, is a prerequisite for a healthy forest in the state.

## 7.2 Forest Fire Losses-

### a. National Level:

There are several papers about the forest fire in India. It is reported that during the Sixth Five-Year Plan (1980-85) in all 17,852 number of fire incidents were reported affecting an area of 5.7 million Ha at an annual average of 1.14 million Ha (Srivastava, 1989). Extrapolations of fire data in two representative areas, i.e. Chandrapur and Haldwani indicate that the total area burnt annually in the country may range between 2.66 and 13.95 million Ha (Saigal, 1989). As per Ministry of Environment and Forests, the forest area that is affected by annual fires could be as much as 37 million Ha.

### b. State Level:

No definite study has been done in A.P. to estimate the extent of forest fires and consequent damages. After the MODIS satellite data was made available by FSI, it was found that 31 percent of the compartments (of the total number of 9553) are prone to fire damage to various degrees in the state leaving balance 69 percent compartments unaffected. Total number of fire incidents in AP reported through MODIS satellite since 2004 is shown in **Table 7.1**. The details of Circle wise fire occurrences in Andhra Pradesh is given in **Table 7.2**. The Division wise details of fire occurrences in various years in Andhra Pradesh are given in **Table 7.3**.

In all **10638** fire incidents were reported in this period of 11 years. Thus on an average 967 fire incidents take place annually in AP. A map of Andhra Pradesh showing forest fire occurrences between 2004 and 2014 is shown in Fig 7.1.

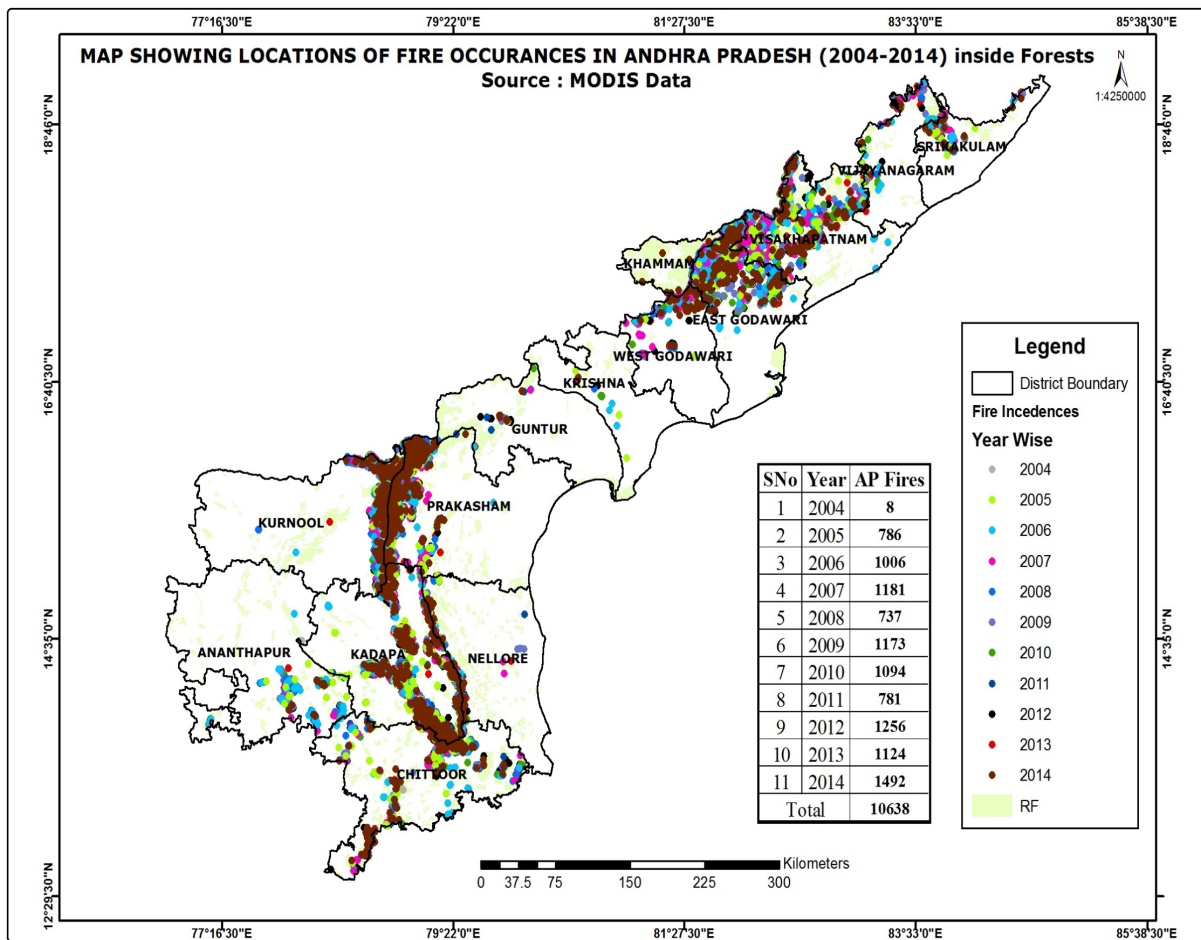


Table 7.1: Table showing the Number of Fire Incidents in A.P observed through MODIS Data.

S. No	Year	AP Fires
*1	2004	8
2	2005	786
3	2006	1006
4	2007	1181
5	2008	737
6	2009	1173
7	2010	1094
8	2011	781
9	2012	1256
10	2013	1124
11	2014	1492
<b>Total</b>		<b>10638</b>

(\*Initial year of reporting of MODIS)

Fig 7.1



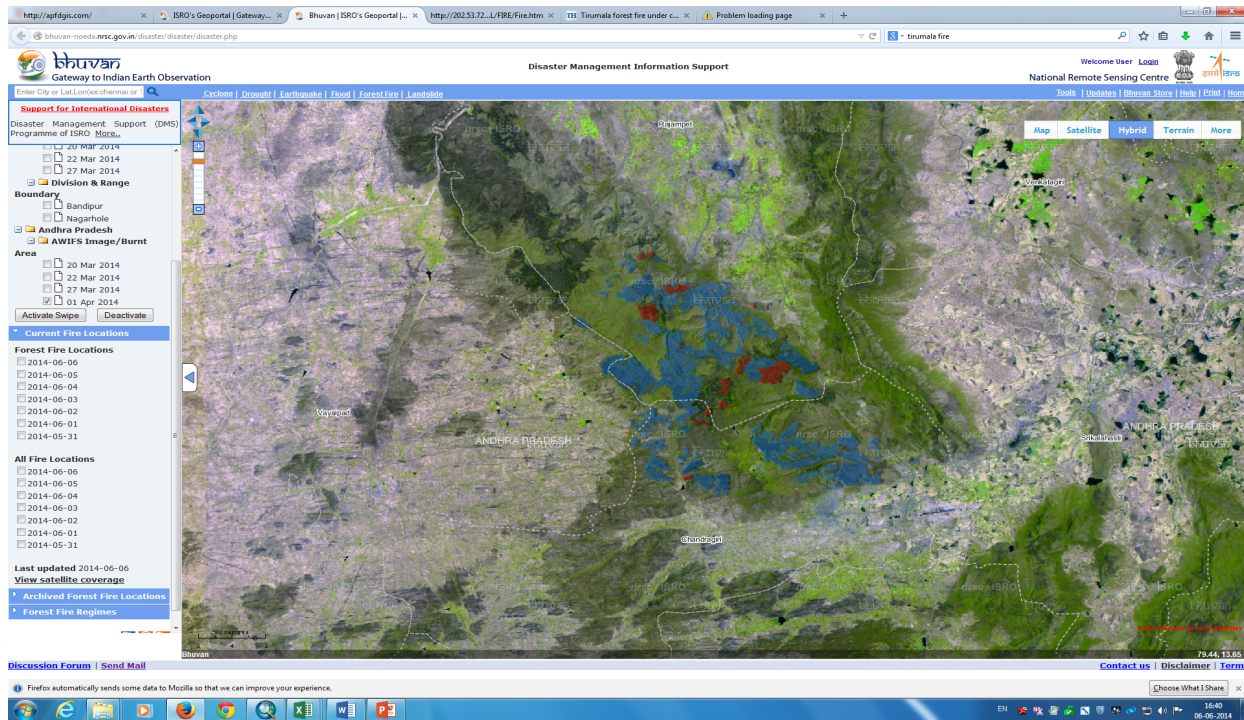


The causes of most of the forest fires in AP are deliberate or incidental caused by persons for collection of NTFP including Beedi Leaf and to some extent for encroachments for cultivation purpose etc. The most severely forest-fire affected areas in the State are Visakhapatnam, and Rajmundry circles and parts of Srisailem Project Tiger area. The Boda grass (*Cymbopogon coloratus*) is the main cause of forest fires in NSTR and Rayalaseema regions. Another NWFP contributing to the forest fire is the Mahua (*Madhuca indica*). Local people in tribal belt collect Mahua flowers to produce a popular beverage or to boil with Sal seeds (*Shorea robusta*) as a seasonal grain substitute; by clearing the growth below the trees after burning which may spread to adjoining forests.

In March 2014 huge fire was spread in Tirumala hill range which grabbed the national attention. This is the first time that such a fire has broken out in the dense forests atop the seven hillocks less than 10km from the temple complex. The burnt area of Tirumala temple surroundings in three days i.e. on 20<sup>th</sup> & 22<sup>nd</sup> March and 1<sup>st</sup> April is 213.91 Sq.Km. as assessed by NRSC from WIFS data.

Fig 7.2

Map showing the burnt area in surroundings of Tirumala Temple (Source: Bhuvan, NRSC)



### 7.3. Forest Fire Pattern In Andhra Pradesh

Andhra Pradesh has mostly dry deciduous forests and trees start drying up from January - February onwards. Rainy season is mostly by South-West monsoon from June to September except for little area in South East Andhra Pradesh covering Chittoor, Nellore and parts of Prakasam and Kadapa districts where North East monsoon comes between October and December. Because of this character, forest fire occurs in Post monsoon period when ground contains certain materials for burning. As analyzed from MODIS data, maximum forest fire occurs in March followed by April and February.

### 7.4 Effects of Fires

The most important ill effect of fires is on the young regeneration, which is killed or dies back, thereby delaying the establishment of a new crop and extending the rotation. Mortality may result from intense fires in older crops, although the trees develop thick bark that protects them. *Eucalyptus* appears to suffer more than the indigenous species by way of reduced stocking and lower yields at maturity. Repeated burning



leads to site deterioration, changes in soil nutrient status and accelerated erosion due to the destruction of the ground flora; which also reduce the rate of growth. Not only do uncontrolled fires burn down the vegetation but the organic matter is adversely lowered, increasing the frequency of flooding and causing soil erosion. In addition, wildlife patterns and habitat may be disrupted. The situation can be improved by an effective protection planning and incentive.

The circle wise and division wise fire occurrence in A.P. is as follows.

<b>Table 7.2: Details of Circle wise Fire occurrences in Andhra Pradesh</b>													
<b>Circle wise Forest Fire List from 2004 to 2014</b>													
S.No	CIRCLE NAME	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	TOTAL
1	ANANTHAPUR	3	51	59	47	37	44	36	31	53	23	65	449
2	FDPT SRISAILAM	3	122	121	175	123	178	150	125	172	149	273	1591
3	GUNTUR	0	93	137	151	76	130	103	102	130	192	183	1297
4	KURNOOL	1	163	174	192	107	227	213	124	204	178	257	1840
5	RAJAMUNDRY	0	97	195	223	218	246	255	150	322	210	197	2113
6	TIRUPATHI	0	144	140	187	91	177	113	206	182	122	338	1700
7	VISAKHAPATNAM	1	116	180	206	85	171	224	43	193	250	175	1644
8	KHAMMAM DIST (7MANDALS)											4	4
<b>Total</b>		<b>8</b>	<b>786</b>	<b>1006</b>	<b>1181</b>	<b>737</b>	<b>1173</b>	<b>1094</b>	<b>781</b>	<b>1256</b>	<b>1124</b>	<b>1492</b>	<b>10638</b>

<b>Table 7.3: Details of Division wise Fire occurrences in Andhra Pradesh</b>													
S.NO	Division Name	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	Total
1	ANANTHAPUR	2	24	41	13	27	24	24	17	16	13	12	213
2	CHITTOOR WEST	1	27	18	34	10	20	12	14	37	10	53	236
3	ATMAKUR WLM	2	64	53	86	54	99	76	49	96	90	117	786
4	MARKAPUR WLM	1	58	68	89	69	79	74	76	76	59	156	805
5	GIDDALUR	0	83	122	132	63	109	93	73	104	170	145	1,094
6	GUNTUR	0	1	2	1	0	5	1	7	7	3	6	33
7	NELLORE	0	9	13	18	13	16	9	22	19	19	32	170
8	KADAPA	0	89	45	50	40	74	79	39	60	55	100	631
9	KURNOOL	0	0	1	0	2	0	0	0	0	1	0	4
10	NANDYAL	0	24	73	75	35	80	81	35	68	73	80	624
11	PRODDUTUR	1	50	55	67	30	73	53	50	76	49	77	581
12	ELURU	0	7	15	32	18	34	23	8	34	18	36	225
13	KAKINADA	0	86	177	190	199	212	229	142	284	191	160	1,870
14	VIJAYAWADA	0	4	3	1	1	0	3	0	4	1	1	18





**Table 7.3: Details of Division wise Fire occurrences in Andhra Pradesh**

S.NO	Division Name	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	Total
15	CHITTOOR EAST WLM	0	10	15	13	10	12	16	18	17	8	17	136
16	RAJAMPET WLM	0	82	71	93	62	93	64	105	103	96	129	898
17	TIRUPATI WLM	0	52	54	81	19	72	33	83	62	18	192	666
18	NARSIPATNAM	1	59	54	98	27	80	84	22	91	82	68	666
19	PADERU	0	28	49	45	20	30	49	9	46	46	31	353
20	SRIKAKULAM	0	9	19	15	10	14	30	2	10	29	21	159
21	VISAKHAPATNAM	0	14	38	28	21	21	24	5	28	50	36	265
22	VIZIANAGARAM	0	6	20	20	7	26	37	5	18	43	19	201
23	KHAMMAMDISTRICT (7 MANDALS).											4	4
<b>Total</b>		<b>8</b>	<b>786</b>	<b>1006</b>	<b>1181</b>	<b>737</b>	<b>1173</b>	<b>1094</b>	<b>781</b>	<b>1256</b>	<b>1124</b>	<b>1492</b>	<b>10638</b>

During the year 2004 a Forest Fire Risk Zonation was carried out using satellite data taking in to account certain parameters like forest density, distance of habitation, road, slope, aspect etc. and maps were generated up to Beat level. These were communicated to field officers for use. However after availability of MODIS fire data, new fire risk Zonation map has been prepared based on the actual fire occurrences. The new zonation based on actuals is highly reliable. An analysis of the high fire occurring areas shows that fire happens whenever inflammable material is there in the forest floor. It is noticed that 3022 compartments in AP get forest fire out of a total of 9553 compartments.

The Fire Risk Zonation map prepared and communicated based on MODIS data between 2004 and 2014, for the use of field officers, is produced below:

**Fig 7.3**

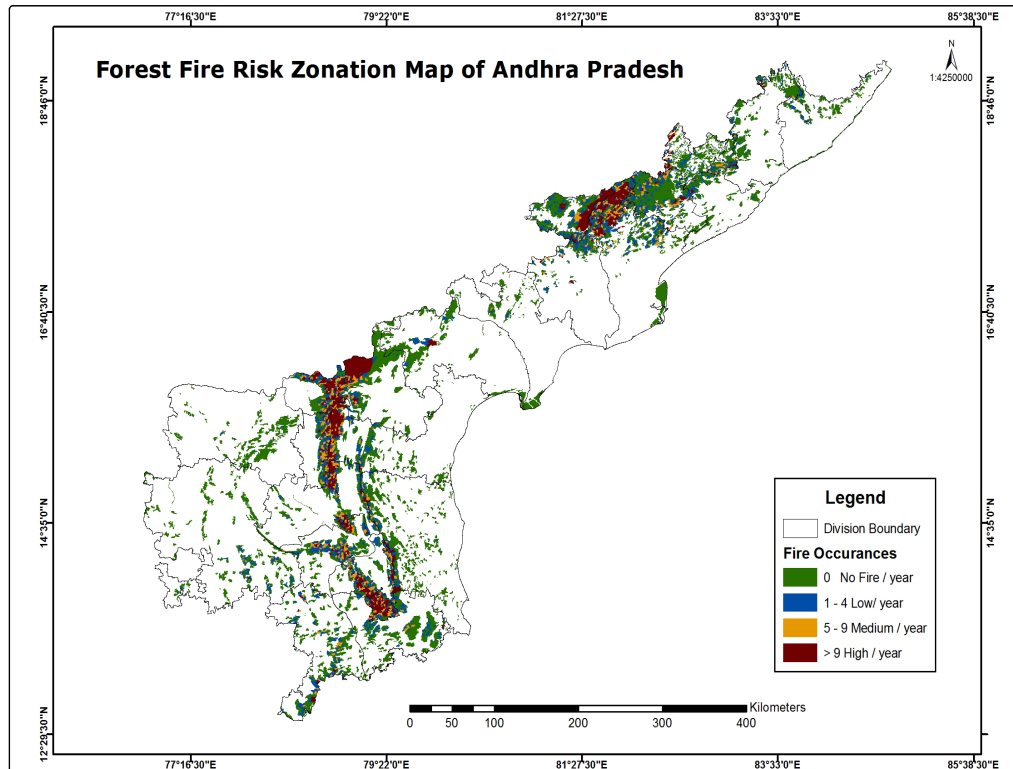
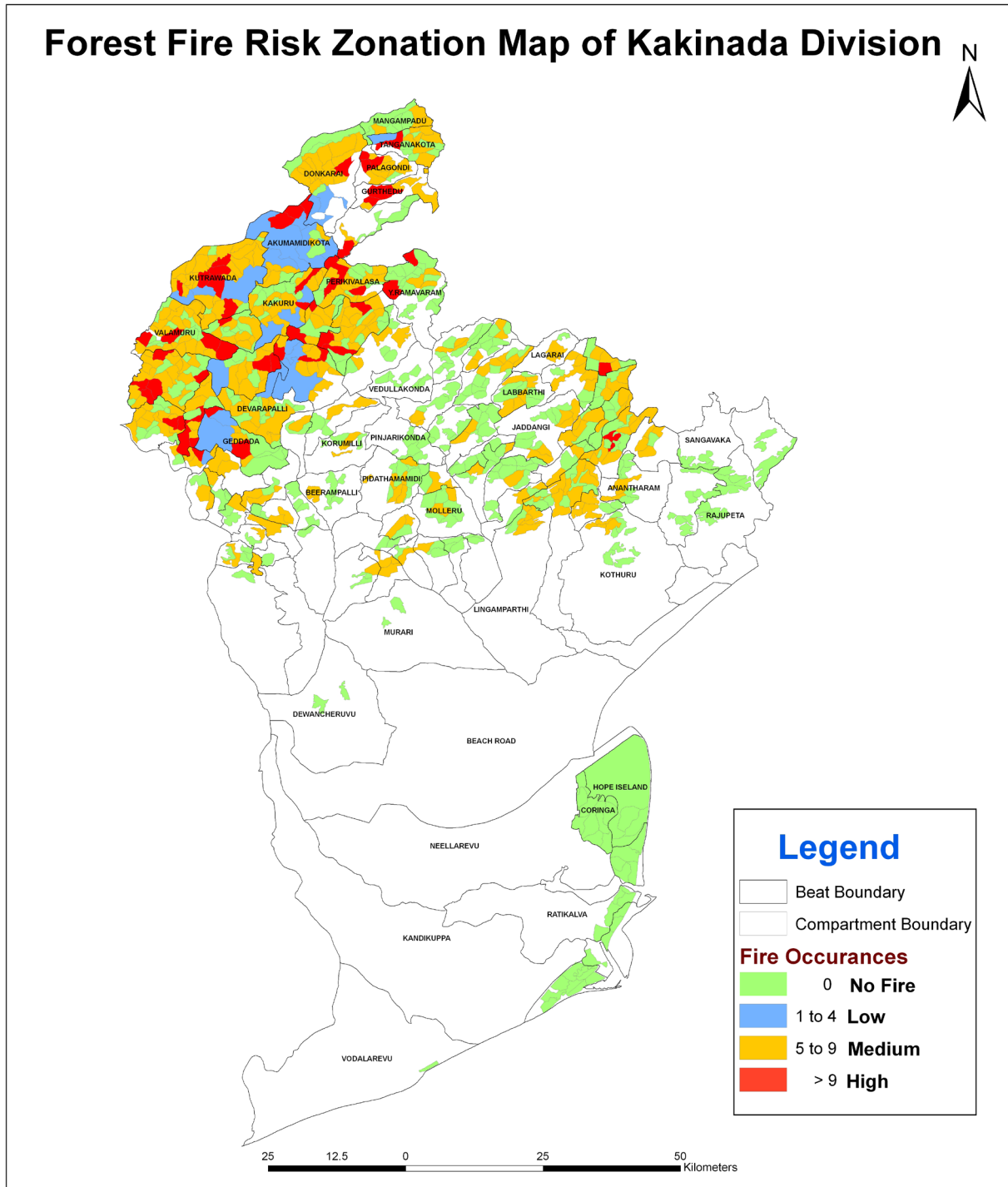


Fig 7.4:



The above map shows that there is no fire in mangroves and coastal areas, where as profuse fire is there in Maredumilli zone, where there is lot of inflammable material.





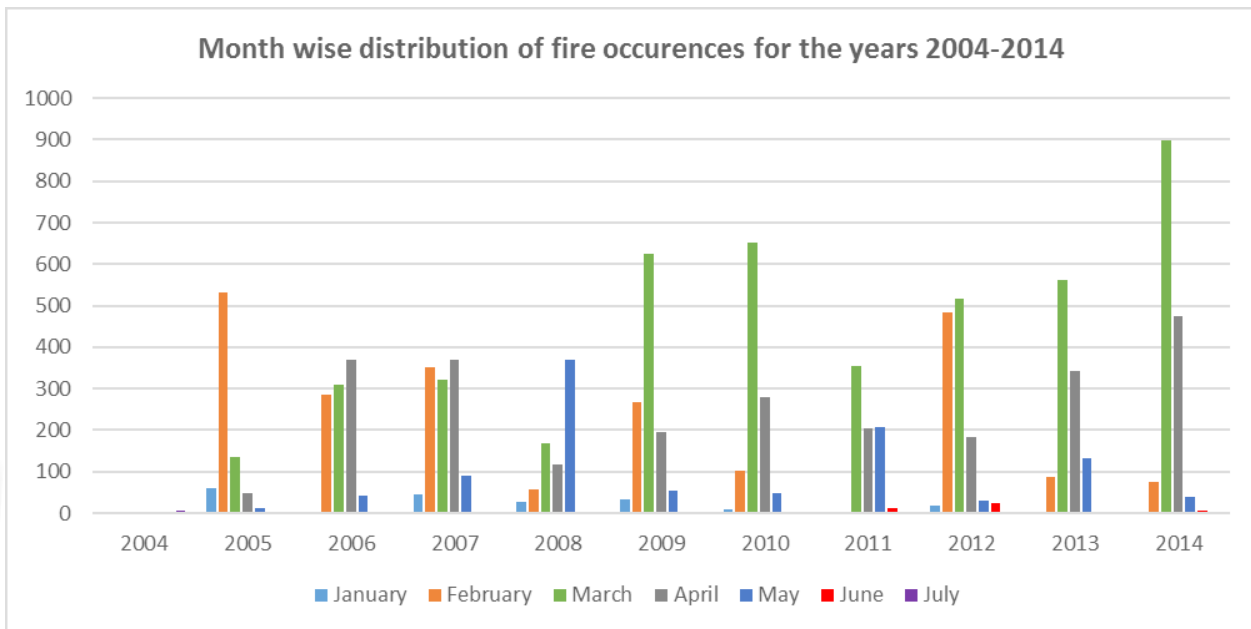
The following table shows the incidence of forest fire in different months in the State:-

**Table 7.4**

Month	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	Total
January	0	60	2	46	27	34	8	2	19	0	0	198
February	1	531	284	351	56	266	103	0	484	88	75	2239
March	0	134	308	320	168	624	653	355	518	563	897	4540
April	0	47	368	370	118	196	279	204	182	341	476	2581
May	0	11	43	91	368	53	48	207	30	131	38	1020
June	0	3	1	2	0	0	3	13	23	1	6	52
July	7	0	0	1	0	0	0	0	0	0	0	8
<b>Total</b>	<b>8</b>	<b>786</b>	<b>1006</b>	<b>1181</b>	<b>737</b>	<b>1173</b>	<b>1094</b>	<b>781</b>	<b>1256</b>	<b>1124</b>	<b>1492</b>	<b>10638</b>

Month wise distribution of forest fires from 2004 to 2014 is shown in Fig 7.5.

**Fig 7.5**



## Chapter-VIII

# Mangrove Forests in Andhra Pradesh

### 8.1 Introduction :

The Godavari-Krishna mangroves are a Mangrove ecoregion of India's eastern coast. The ecoregion covers an area of 7,000 square kilometres (2,700 Sq. mi), in discontinuous enclaves extending from the state of Orissa in the north to Tamil Naidu in the south. The largest mangrove community in the ecoregion lies in the delta of the Godavari and Krishna rivers in Andhra Pradesh; other mangrove communities can be found at Point Calimere in Tamil Naidu, Pulicat Lake in Andhra Pradesh and Tamil Naidu, and the Bhitarkanika Mangroves and Chilika Lake in Orissa.

### 8.2 Flora and Fauna:

The predominant mangrove species include *Avicennia marina*, *Suaeda* spp., *Rhizophora* spp., and *Bruguiera* spp. They have a thick canopy and an undergrowth of climbing plants and shrubs.

Mangroves are an important habitat for much wildlife such as the saltwater crocodiles that shelter among the roots and feed on the fish and other seafood in this warm mixture of fresh and seawater. These mangroves are home for many insects, molluscs, shrimp, crabs and fish as well as 140 bird species, including the threatened Lesser Frigatebird (*Eupodotis indica*), best known for the male birds leaping breeding displays, and large communities of aquatic birds such as egrets, flamingos (*Phoenicopterus* spp.), spot-billed pelicans (*Pelecanus philippensis*), spoonbills (*Platalea* spp.) and painted storks (*Mycteria leucocephala*).

### 8.3 Threats:

Mangroves are vulnerable to coastal development including prawn farming, other agriculture that diverts fresh water from reaching the coast and seaside urbanisation. Most mangroves on the east coast of India have been cleared and while 14% of the ecoregion is under protection in Point Calimere Wildlife and Bird Sanctuary, Pulicat Lake Bird Sanctuary and the Bhitarkanika National park even those areas are not secure.

### 8.4 Mangroves in Andhra Pradesh :

In AP mangroves found in the districts of East Godavari, Krishna, Guntur and Nellore districts. They are as follows

**Table 8.1**

S.NO	Name of the District	Name of the Division	Name of the Block having Mangrove	Area of the Block in ha	Mangrove Area in Ha
1	Nellore	Nellore	Epur	216.19	167.64
			Ernadu	1155.32	922.59
			Kothapatnam Coastal	599.74	10.41
			Karikadu Rf	503.81	73.23
			Kummarapalem Rf	113.89	88.48
			Thummalapenta N	326.99	61.21
			Vernadu Block I,II,I	361.92	124.47
Nellore Total			3277.86	1448.03	





S.NO	Name of the District	Name of the Division	Name of the Block having Mangrove	Area of the Block in ha	Mangrove Area in Ha
2	Guntur	Guntur	Adavuladeevi Ex-1	63.63	47.41
			Adavuladeevi Bit-1	475.61	165.92
			Kothapalem Block-1	1667.35	643.44
			Kothapalem Ex-1	1156.69	1493.45
			Lankavani Dibba	3647.34	663.11
			Muthayapalem	3289.18	223.36
			Muthayapalem Ex1	306.70	16.40
			Nizampatnam	1701.92	938.03
			Pothumeraka	1879.38	1163.12
<b>Guntur Total</b>				<b>14187.80</b>	<b>5354.24</b>
3	Krishna	Vijayawada	Elichetladibba RF	5244.61	1706.14
			Nachugunta RF	6895.14	3702.39
			Sorlagindi RF	2360.42	633.27
			Sorlagondi Ext RF	3011.16	1752.27
<b>Krishna Total</b>				<b>17511.33</b>	<b>7794.07</b>
4	East Godavari	Kakinada	Balusutippa Rf	572.02	1290.22
			Coringa Extn Rf	18011.89	10668.16
			Coringa Rf	4894.86	614.76
			Kandikuppa Rf	3857.07	2219.27
			Kothapalem Ii Rf	65.28	51.27
			Matlatippa Rf	529.14	607.36
			Rathikalava Rf	1488.24	1651.15
			Vodalarevu Rf	202.85	190.21
<b>Kakinada Total</b>				<b>29621.35</b>	<b>17292.40</b>
<b>Grand Total</b>				<b>64598.34</b>	<b>31888.74</b>

### 8.5 Importance of Mangroves :

Mangrove serve two purposes. Firstly it protects the sea from invading the land and thus saves main-land from cyclones and Tsunamis. It thus protects the human beings from natural disasters. Secondly, it serves as a very important habitat for important flora and fauna. Many sanctuaries and wetlands are situated in the mangroves. Protection of mangroves is therefore important for human survival. Most mangroves are covered by sanctuaries in AP.

### 8.6 Forest Cover changes in mangroves inside notified blocks :

The forest cover changes between the period from 1998-2012 were attempted by visual interpretation on LISS III images of IRS satellites taking assistance from Google earth images and Bhuvan portal (NRSC). The results are as follows.

**Table 8.2**

Mangrove Cover Change Information of 1998-2012								
S.No.	Division	No.of Change Locations			Area in Ha			
		Positive	Negative	Total	Positive	Negative	Total	Net
1	Guntur	95	3	98	2164.32	19.66	2183.98	2144.98
2	Krishna	45	11	56	1799.72	268.02	2067.74	1531.70
3	Kakinada	50	20	70	616.55	415.43	1031.98	201.12
4	Nellore	2	3	5	20.03	65.38	85.41	-45.35
<b>Total</b>		<b>192</b>	<b>37</b>	<b>229</b>	<b>4600.62</b>	<b>768.49</b>	<b>5369.11</b>	<b>3832.45</b>

### **8.7 Analysis of the results:**

Above results shows that the mangrove forest cover is improving in the state except Nellore Division. The mangrove cover during 1998-2012 has increased by 38.32 Sq.km. The reasons are protection, stopping working of mangrove coups and successful plantation in the mangrove areas.





