Andhra Pradesh
State of Forest Report
2012

Andhra Pradesh Forest Department
Government of Andhra Pradesh
Hyderabad

Andhra Pradesh
State of Forest Report - 2012

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N. KIRAN KUMAR REDDY

CHIEF MINISTER
ANDHRA PRADESH

MESSAGE

It gives me immense pleasure to learn that the Andhra Pradesh Forest Department is bringing out 3rd Annual **"Andhra Pradesh State of Forest Report 2012"**. The report shows areas of growth and drain precisely with geographical locations, which greatly helps in protection and management of Forests and Wildlife. The report includes the analysis of Forest fires in the State, which has immense importance in creation of a healthy Forest. This, coupled with analysis of Forest cover in Protected Areas and Vana Samrakshana Samithies (VSS) areas gives an insight into the conditions of Wildlife areas and impact of involvement of the communities in the protection of Forests .

I am extremely happy that Andhra Pradesh is the only state in the Country, which is capable of bringing out such an Annual **"State of Forest Report"** using LISS III data of Indian Remote Sensing Satellites.

I congratulate the PCCF (HoFF) and his entire team for bringing out this excellent report.

21-11-2012
Hyderabad

Kiran Reddy

N. KIRAN KUMAR REDDY

SATRUCHARLA VIJAYA RAMA RAJU
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MESSAGE

The second decade of the new millennium is being observed as the United Nations **"Decade on Bio-diversity"** and the eleventh meeting of the Conference of Parties (COP) to the convention on Biological Diversity is organized in the State at Hyderabad in October 2012. It is an accepted fact that forest is the habitat for the majority of Biodiversity. Against this backdrop conservation and protection of our forests becomes crucial. The **"Andhra Pradesh State of Forest Report 2012"** brought out by Andhra Pradesh Forest Department assumes significance as it determines the loss and drain of our biological resources using satellite technology almost in near real-time. I feel happy that such a report is brought out every year which helps us in Conservation, Protection and Planning of our Natural Resources. I hope the publication will help every forester, planner and Wildlife enthusiast of the Country.

22-09-2012
Hyderabad

SATRUCHARLA VIJAYA RAMA RAJU

M. SAMUEL, I.A.S.,
Special Chief Secretary to Government

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MESSAGE

Forests are Renewable resources and the existence of human beings and their livelihood, especially people living in rural areas is closely linked to the Forests. The rich diversity of our forest resources that yield fuel, fodder, timber and edible prouducts, should be studied so that requirement of dependent communities are met. Forest areas in Andhra Pradesh represent a varied composition consisting of diverse species. Many of the species are not commercially viable, but they are part of the forest ecosystem performing their role in Nature. To distinguish the species and their availability, it is essential to assess their spatial distribution and quantify the availability.

I am happy to know that our Forest Department is bringing out “Andhra Pradesh State of Forest Report 2012” which depicts the changes in forest cover in the State between 2009 (October - December) and 2010 (October - December). Preparation of such periodic reports help the department in proper planning and fixing the priorities in planned development of our State.

I congratulate the Prl. Chief Conservator of Forests and his team of IT Wing who have toiled hard to bring out such a good and comprehensive report with proper analysis of the data collected.

21-09-2012
Hyderabad

21/9/2012

M. SAMUEL

FOREWORD

Andhra Pradesh is the 4th largest State of India in terms of geographical area. Approximately one fourth of this area is occupied by notified forests. Including the trees outside the forests, approximately 27% of the area is bearing the tree cover. The forests play a crucial role in the well being of humanity by maintaining ecological balance and there by providing environmental stability. However the ever growing population of human beings as well as cattle head exerts heavy biotic pressure on the forests leading to quantitative as well as qualitative degradation of the forests. Therefore it is necessary to measure and monitor the effects of biotic pressure on the health of the forests periodically. The Forest Survey of India (FSI) has been undertaking this task on a two-year cycle, using RS & GIS technology since 1987 and presenting the results nationwide through its India State of Forest Reports. However these reports have presented a macro level picture, giving details only up to District level. Whereas for day to day challenges of management of forest and wildlife protection, details up to Beat and Compartment levels are necessary. The Geomatics Centre of this Department has been interpreting the satellite images since 1996 and providing crucial inputs to the field officers. However since 2010 the IT wing has brought out AP State of Forest Reports on par with the India State of Forest Reports, for the State of Andhra Pradesh. The Geomatics Centre of the Department is now equipped with latest hardware and software and technically qualified officers and person power. The present SFR 2012 is the third such report in the series. It gives very precise and accurate information about the changes in forest cover up to Beat level. The Officers and Staff of IT Wing have toiled hard to bring out this publication. I congratulate the APCCF (IT) and his team for this effort.

8/11/2012

S.V. KUMAR, IFS
Prl. Chief Conservator of Forests & HoFF
Andhra Pradesh, Hyderabad

08-11-2012
Hyderabad

PREFACE

The Andhra Pradesh State of Forest Report 2012 is the third SFR produced by IT Wing of Andhra Pradesh Forest Department using LISS III data of 2009 & 2010 IRS P6 Satellite. The work of interpretation has been confined to the notified forests only to assess positive and negative changes in the forest cover. The earlier 2 APSFRs published in 2010 and 2011 were of great help to the field officers and planners as it gave reliable and accurate details of forest cover change in various Divisions up to Beat / Compartment level. This was difficult to detect and cumbersome to delineate by using traditional methods in a short span of period. It is believed that the present Report- APSFR 2012 will also prove to be highly useful to the field officers in improving the forests by way of devising better and effective strategies for protection and will act as Decision Support System. The broad contents of the APSFR 2012 are summarized below;

Chapter-I deals with the Introduction wherein a brief about Andhra Pradesh forests and activities of Geomatics wing are presented.

Chapter-II deals with the satellite data used and the procedure adopted, limitations of technology, the accuracy aspects and summary of the cost of generation of the APFSR 2012.

Chapter –III deals with State wide results and the extent of various forest canopy cover classes in various Divisions, VSS areas, Protected Areas (PAs) and a brief analysis of changes between 2009 end & 2010 end.

Chapter-IV lists the Forest Division wise changes in forest canopy cover between various classes up to Beat level; where changes have occurred.

Chapter -V deals with forest canopy cover change Statistics in Protected Areas.

Chapter – VI deals with forest canopy cover change Statistics in Joint Forest Management or VSS areas.

Chapter - VII is a new chapter dealing with details of forest fires occurring in Andhra Pradesh.

There has been considerable improvement in the interpretation on account of receiving in time online feedback through FCCMIS module of APFMIS. It is hoped that this report shall assist the planners and field Officers in managing the natural resources more effectively.

1/11/12

P.K. SHARMA, IFS
Addl. Prl. Chief Conservator of Forests (IT)

01-11-2012
Hyderabad

ACKNOWLEDGEMENTS

Bringing out a wall to wall mapping and delineating changes in Forest cover in the notified forests of Andhra Pradesh on annual basis is a herculean task and this is not possible without the co-operation of all the Officers and staff of the Department. Support and guidance of the Head of the Department is crucial in this regard. I gratefully acknowledge the guidance and encouragement given by Sri. Hitesh Malhotra, IFS, the then PCCF (HoFF) in bringing out this SFR. Sri. P.K.Sharma, APCCF (IT) led the team from the front and took serious pains in day to day guidance right upto going through the entire manuscript himself. His continuous encouragement in bringing out a correct report is sincerely acknowledged.

The direction and guidance of the Technical Advisory Committee on Geomatics consisting of Dr.Devendra Pandey, IFS (Retd), former Director General FSI, Dr. MSR Murthy, formerly Head Forestry Division, NRSC, Dr.D.M.Reddy, formerly Director General, APSRAC, Dr.S.V.Reddy, Additional Director (Scientific Biosphere Reserve), MoEF are sincerely acknowledged. Their valuable suggestions have helped to improve the SFR to a great extent.

Sri. A.Kishan,IFS,CF(MIS), Sri. P.Sreenivasa Rao, DCF(GIS), Sri. S. Madhava Rao, ACF (PMU-I), Dr. A. Rama Murthy, ACF (RS) have contributed immensely in shaping up the report and the same is placed on record. Contribution of Smt. J.P.Sowjanya and Sri. D.V.Reddy, FROs by way of ground truthing of the change locations are sincerely acknowledged.

Geomatics Team of the Project Scientists consisting of Sri. M.Rajeshwar Reddy, Sri. K.Bhaskara Rao, Sri. K.Rajashekar Reddy, Sri. B.Rama Krishna, Miss. Ch.Neeraja, Smt. G. Nagamallika, Smt. I.Sheeba, Smt. D.Kavitha, Sri. S.Ashwini Kumar, Sri. A.Srinivasa Rao, Sri. Y.VVDS Chakradhar Rao, Smt. K.Anuradha, Miss. K.Sravani, Miss. Ayesha Afreen, Sri. G.Venu babu and Sri. B. Kishore have worked very hard to bring out this report. The team had sincerely worked right from data browsing, Georeferencing, 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, without which this report could not have been possible. At the end I acknowledge all the colleagues in Head Office and the field officers for their valuable contribution in bringing out this publication.

01-11-2012
Hyderabad

Dr. H.C. MISHRA, IFS
Addl. Prl. Chief Conservator of Forests (GIS)

Contents

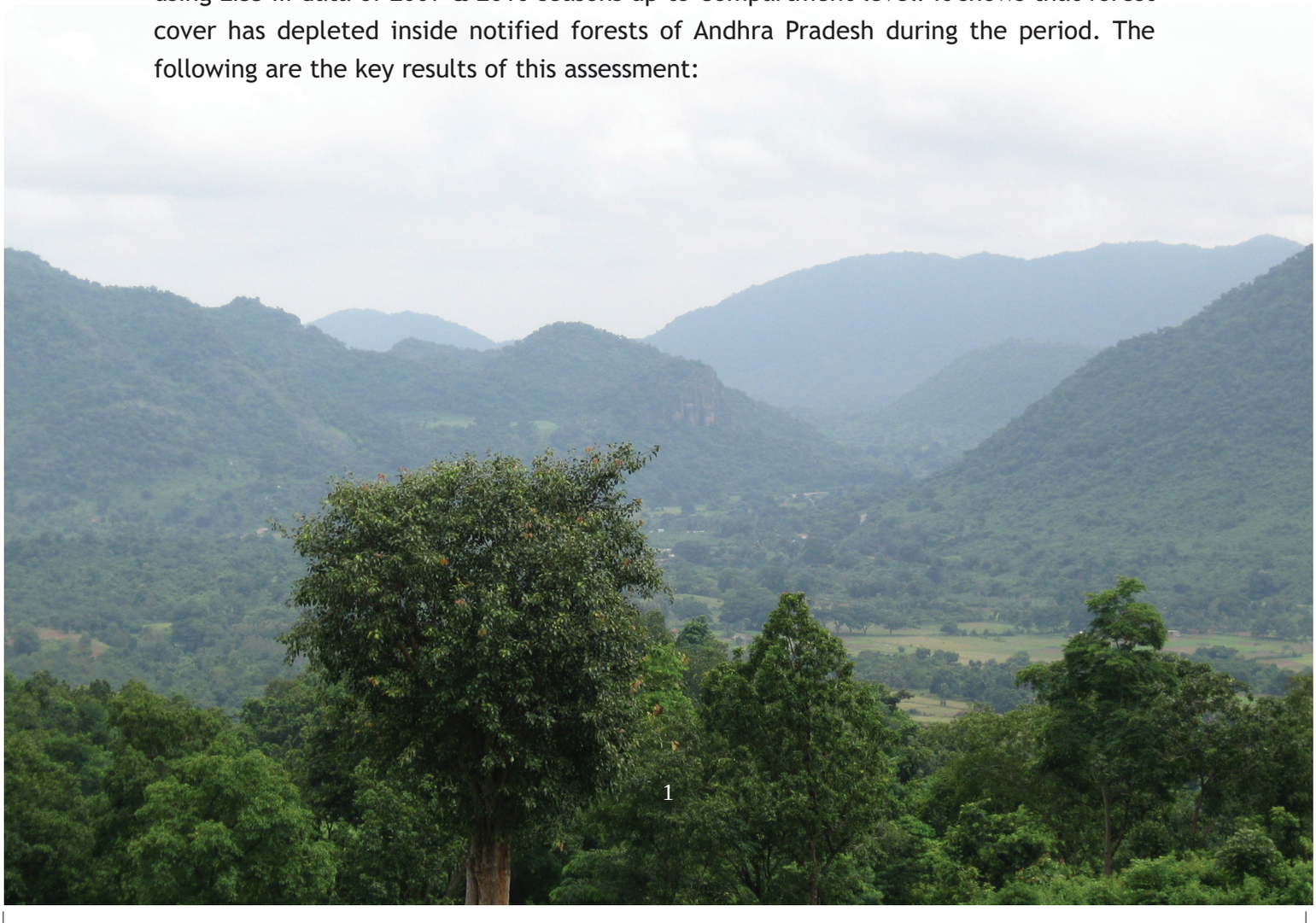
Abbreviations

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

EXECUTIVE SUMMARY

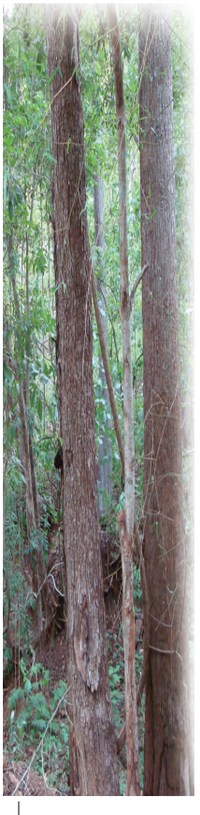
In the recently concluded Earth Summit held in in Rio de Janeiro, Brazil in June 2012 on "Sustainable development" attended by over 100 Countries of the World, final blue print "The Future we want" was generated which stresses on the need for green development, decrease in pollution and global warming. The Conference of Parties (CoP-11) sponsored by the United Nations Organization (UNO) on "Conservation of Bio-diversity" held in Hyderabad, Andhra Pradesh in October 2012; is a further step in conservation efforts. Thus there is global concern these days for conservation and efforts are necessary in that direction.

"The Andhra Pradesh State of Forest Report" gives a detailed view of the health of the notified Forests in the State on Annual basis. State of Forest Report 2012 is the third report in the series. It gives precise locations of the forest cover changes, assessed using LISS III data of 2009 & 2010 seasons up to Compartment level. It shows that forest cover has depleted inside notified forests of Andhra Pradesh during the period. The following are the key results of this assessment:



Key Results:

1. The state had 931.73 Km^2 of Very Dense forest, 18418.53 Km^2 Moderately dense forest & 22686.57 Km^2 Open forest in 2009 and corresponding figures in 2010 are 931.73 Km^2 of VDF, 18408.48 Km^2 MDF, 22651.28 Km^2 Open forest.
2. There is a reduction of 10.05 Km^2 in MDF and 35.29 Km^2 in open forest. There is net loss of 45.34 Km^2 during this period.
3. There is degradation of forests from higher canopy density class to lower canopy density class in an extent of 69.99 Km^2.
4. There is Positive change in an area of 5.85 Km^2.
5. 5.48 Km^2 of MDF, 28.50 Km^2 of open forest and 18.75 Km^2 of scrub forest has been converted into Non-forests. Of this, 36.44 Km^2 of forest is lost due to fresh encroachments and 16.29 Km^2 due to clearance of jungle growth for raising of plantations & harvesting of matured plantations and to some extent diversion of forest land for non-forestry purposes.
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 loss of forest cover. Hence, the **net loss of forest cover** during this period is 36.44 Km^2.
7. **VSS** areas account for 9.57 Km^2 of encroachments.
8. **Protected Areas** account for 4.31 Km^2 of encroachments.
9. **Most negative change** due to encroachments of 19.28 Km^2 was found in Khammam Circle followed by Warangal Circle with 6.66 Km^2 and Nizamabad Circle with 2.46 Km^2 and Hyderabad Circle showed the **least negative change** due to encroachments of 0.42 Km^2
10. **Encroachments** were noticed in 34 Divisions of the state. The Divisions contributing most negative changes due to encroachments are: Bhadrachalam South (5.41 Km^2), Kothagudem (4.89 Km^2), Khammam (3.80 Km^2), Warangal South (2.90 Km^2), Warangal North (2.73 Km^2) and Paloncha (2.35 Km^2).
11. **No changes** were found in 07 Divisions, viz., Atmakur WLM, Achampet WLM, Nagarjuna Sagar WLM, Nandyal, Medak WLM, Chittoor West and Karim Nagar West.
12. **Net positive change** was found only in one Division, i.e., Rajampet.



Chapter - I
INTRODUCTION

1.1 About the State:

Andhra Pradesh is the 4th largest State in India, geographical area wise; with an area of 2,75,068 Km^2. It is bounded by Maharastra, Chhattisgarh and Orissa in the north, Bay of Bengal in the east, Tamil nadu in the south and Karnataka & Maharastra in the west. The State was formed on 1st November 1956 when States were reorganized on linguistic basis by Government of India. It has 63,814 Km^2 of notified forest land, which is 23.20% of the Goegraphical area.

The population of the State is 84.66 million (2011 census) which is 7.41% of country's population. Nearly 73% of the population of the State is rural, which primarily depend on agriculture for livelihoods. Scheduled castes constitute about 16% and Scheduled tribes about 6% of the population. Hyderabad, Visakhapatnam and Vijayawada are the principal cities in the State with over a million population. Traditionally, the State is divided into three regions called Andhra region consisting of the 9 districts of coastal area, Telengana region consisting of 10 districts of erstwhile Hyderabad State and Rayalseema region consisting of 4 southern districts.

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 under the control of forest Department and outside separately. It presented a Nation wide & State wise picture of the green cover, inclusive of the areas outside the notified forests. These provide data only upto the district level and no statistics of forest/tree cover were available below the district level. Therefore a necessity was felt for generating this data for the notified forest areas, which are under the control of Forest Department, upto the smallest unit of administration, i,e Beat level. This could have been possible only with the setting up of Geomatics center 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 a small room in the old Aranya Bhavan building with the 386 personal computers with 80 MB harddisk and 1 MB RAM. The first software installed was the IDRISI package gifted by the FAO. In due course of time other required hardware, software were added to the Geomatics Centre.

Few Officers of the Department were picked up for training in the Remote Sensing and GIS and sent to ITC Netehrlands, IIRS Dehradun etc., 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 personnel of entire Department and to the other members of VSSs etc.

The first thing required for the monitoring of forest cover changes upto Beat level was to create spatial databases 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 block & 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 and later all latest hard ware and software procured Subsequently about 100 basic and derived themes were generated on 1:50 K Scale, mostly in-house. This data is being used in the monitoring of forest cover changes and several other applications in the department.

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 in Adilabad District using IRS IA/IB LISS II images of 1988 and 1994 using "Interdependent Visual Interpretation" method. The results were brought out in 1995-96. Subsequently, for interpreting the IRS IC and IRS 1D LISS-III data of 1996 & 1998, the task was outsourced. These Agencies digitally interpreted the canopy densities of the forests and submitted the results to the Forest Department. The notified forests were classified into **Waterbodies, Blanks/others**, **Scrub** (0 to 10% Canopy), **Open forests** (10 to 40% canopy) and **Dense forests** (>40% canopy) in line with FSI classification.

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

1.4 Refinement of methodology of Forest Cover & Change Assessment:

The Forests of Andhra Pradesh are 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 doesn't 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 Adilabad, Nizamabad, Medak, Warangal, Karimnagar, Khammam, Nalgonda, 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 Mahabubnagar, Kadapa and Hyderabad & RangaReddy and better method in terms of final accuracy was taken. The 2008 image was compared with 2007 classified image & FCC to discern the changes apart from using the ERDAS matrix tool. Similarly the 2009 image was compared with 2007 classified image using ERDAS Matrix tool keeping 2008 changed polygons in the background.This gave the changes between 2008 and 2009. Further 2008 and 2009 FCCs were visually compared compartment wise and all positive and negative changes were polygonised. Similarly 2009 FCC was compared with 2010 FCC using ERDAS Matrix tool as well as visually and positive and negative changes were polygonised, while keeping 2007-08 & 2008-09 changed plygons in the back ground. The changes were to some extent ground truthed by Geomatics wing and the remaining by the field staff for total verification. For easy access to the data, all the change points were kept on the APFD's website. Feedback was obtained through a web enabled MIS package developed by the Department called as "**Forest Cover Change MIS**" and few members of staff have given their reports using traditional modes – paper reports & e-mails.

Over the years the digital interpretation of Satellite data had been done independently, as a result changes in Forest cover were prone to interpretational errors. Therefore, APFD has switched over to **Vector based approach like the FSI from 2007** in which forest cover change is mapped in polygons (Vector) by defining clusters of pixels with boundaries. This improves the cartographic presentation of the output, helps map the changes more accurately and makes the output available for use by protection staff. Both positive and negative changes were captured for about 1200 locations and communicated to field staff for verification & feedback.

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 form. It was multi spectral (LISS- III Sensor) data of IRS P6 satellite with a resolution of 23.5m.

One scene of LISS – III covers an area of about 20,000 km^2 (140 km *140 km); there are considerable overlaps (15 to 20 percent) among adjacent scenes. Also at the borders of the country or for islands, the whole scene has to be procured even though the Area of Interest (AOI) may be small. Thus a total of 30 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 2010	Date of pass 2009	Remarks
1	99/58	28-10-2010	02-11-2009	Cloud free
2	99/59	15-12-2010	02-11-2009	,,
3	99/60	15-12-2010	02-11-2009	,,
4	99/61	15-12-2010	02-11-2009	,,
5	99/62	08-01-2011	02-11-2009	,,
6	99/63	21-11-2010	02-11-2009	,,
7	100/59	20-12-2010	01-12-2009	,,
8	100/60	20-12-2010	01-12-2009	,,
9	100/61	20-12-2010	01-12-2009	,,
10	100/62	13-01-2011	01-12-2009	,,
11	100/63	13-01-2011	18-01-2010	,,
12	101/59	14-10-2010	19-10-2009	,,
13	101/60	14-10-2010	19-10-2009	Partly Cloudy
14	101/61	14-10-2010	19-10-2009	Cloud free
15	101/62	14-10-2010	19-10-2009	,,
16	101/63	18-01-2011	19-10-2009	,,
17	101/64	18-01-2011	19-10-2009	,,
18	102/60	30-12-2010	24-10-2009	,,
20	102/61	30-12-2010	24-10-2009	,,
21	102/62	No Data	24-10-2009	,,
22	102/63	No Data	04-01-2010	,,
23	102/64	No Data	24-10-2009	,,
24	103/59	30-09-2010	22-11-2009	,,
25	103/60	28-01-2011	22-03-2010	,,
26	103/61	28-01-2011	22-03-2010	,,
27	104/59	16-12-2010	27-11-2009	,,
28	104/60	09-01-2011	27-11-2009	,,
29	105/59	27-11-2010	26-12-2009	,,
30	105/60	27-11-2010	15-10-2009	

2.2 Technical Advisory Committee:

Government of Andhra Pradesh has constituted a Technical Advisory Committee Vide GO Ms No.121, EFS & T-(For-III) Deptt. 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) Deptt. 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. Devendra Pandey, IFS (Retd.) Ex-DG of FSI, Dehradun, presently stationed at New Delhi.	Member
6.	Addl. Prl. CCF (IT), O/o Prl.CCF, Hyderabad.	Convener
7.	Addl. Prl. CCF (GIS), O/o Prl.CCF, Hyderabad.	Member

Accordingly, the Committee met on 11.11.2011 and took the following decisions:-

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

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

c) To use LISS-IV & Cartosat merged data for Working plan preparation, Trees outside Forests estimation etc.

Pursuant to this Andhra Pradesh Forest Department has adopted the Vegetation Index (NDVI) method.

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 and accuracy of 85%was achieved. This Classified image was taken as the basis for bringing out forest cover changes in future. Simultaneously, 2008 and 2009 changed polygons were also taken into account to determine the changes between 2009 and 2010.

The **ERDAS Autosync module** was used to register the 2010 image taking 2007 image as master image. It took only about 15 minutes to Geo-reference one scene of 2010 image. After this, the 2010 image was roughly classified into various classes and the ERDAS matrix tool was used to determine various changes from each class of 2009 to each class of 2010. The 2008 and 2009 change polygons were overlaid on the 2009 FCC and changes between 2009 and 2010 were determined by manual Polygonisation.

NDVI slicing demarcating water, Non-Forest, Scrub, Open Forest, Moderately Dense Forest and Very Dense Forest was done in the ground. All the **negative NDVI pixels were treated as Water**, whereas low NDVI values were treated as Non-Forest. It was noticed that December & January have low NDVI values than that of October & November Scenes. Therefore normalization of scenes was done when the scenes were of different months. Normalization of the scenes refers to changing the histogram of a slave image taking another image as a master. It is used for temporally different and spatially coincident images.

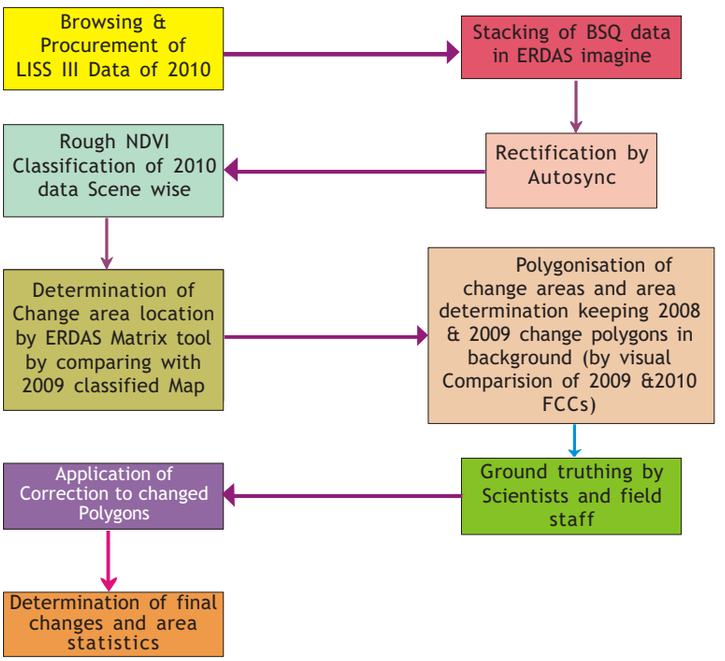
After completing the NDVI slicing of the images, Ground truthing was done and necessary editing to the images carried out. It was seen that NDVI slicing gave accuracy between 72 to 95% without editing after the image of 2010 was roughly classified. ERDAS matrix tool was used to get the change points. The change points were then digitized on the

FCC of 2010 image. The matrix method, sometimes does not give the location of all the change points. To verify other possible change points the 2010 FCC was overlaid by swiping over the 2009 FCC and few more change points were detected.

The lat-long of the change Polygons as well as change classes both (from class & to class) and areas were communicated to the field officers for verification and reports obtained. About 200 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 carriedout 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.
- Young plantations and species having less chlorophyll content in their crown, do not give proper reflectance and as a result correct interpretation of such areas becomes difficult.
- Considerable details on ground could be obscured in areas having clouds and shadows. It is difficult to interpret such areas without the help of collateral data.
- Variation in spectral response pattern during leafless period poses problems in interpretation.
- Gregarious occurrence of bushy vegetation like Lantana and certain agricultural crops, such as sugarcane, cotton, etc. often pose problems in delineation of forest cover change as their spectral response pattern is similar to that of tree canopy.
- In encroached areas harvested agriculture crop gives a pseudo change impression.

2.5 Accuracy Assessment :

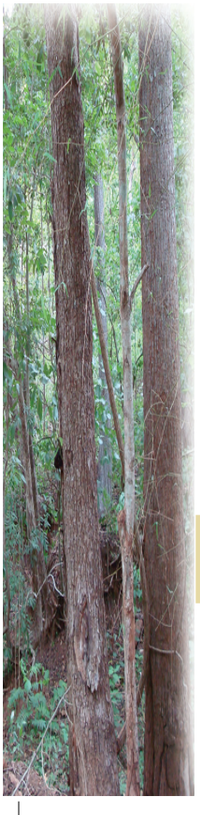
Accuracy was estimated in the monitoring activity restricting to the change polygons only. It was found that the change polygons given by Geomatics wing were acurate in extent, location and shape. The accuracy achieved was of extremely high order of about 98%. Occasional errors were found in interpretations 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 encroached forest lands.

2.6 Cost and Time of bringing out APSFR 2012 :

An expenditure of approx. Rs. 29.00 lakh is involved in the entire exercise (execluding the cost of Forest Department persondays). The details are as follows :

S.No	Item of Work	Cost in Rs.
1.	Cost of 29 scenes of LISS III data @ 7000/- per scence	2,03,000.00
2.	Proportionate cost of Software in average ERDAS packages and 1 autosync is used only 20%. Cost is projected.	3,00,000.00
3.	Cost of Hard ware-25% of 6 Computers cost	1,25,000.00
4.	Cost of 6 scientists doing lab and field work per 1 year.	12,00,000.00
5.	Cost of field trips	50,000.00
6.	Cost of printing of SFR (1000 copies)	2,00,000.00
7.	Ground truthing expenditure by FBO's (@ 1 location per day)	7,00,000.00
8.	Miscellaneous	22,000.00
	Total	29,00,000.00

S.No	Item of Work	Time schedule
1.	Browsing ordering and collection of data from NRSC	September 2010 to March 2011
2.	Geo-referencing, classification and detection of change polygons.	November 2010 to March 2011
3.	Ground truthing the change polygons	January 2011 to June 2011
4.	Collection of feedback from field staff.	January 2011 to September 2011
5.	Preparation of Report	October 2011 to June 2012
6.	Printing of report	November 2012



"What we are doing to the forests of the world is but a mirror reflection of what we are doing to ourselves and to one another."

~ Mahatma Gandhi

Chapter - III
STATEWIDE RESULTS AND ANALYSIS

3.1 Introduction:

Andhra Pradesh State lies between latitudes 12.6230 & 19.9170 N and longitudes76.7610 & 84.7660 E. The Geographical Area of the State is 2,75,068 km^2 which is 8.37 % 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 and 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 Rayalaseema region and Nellore district.

Land use pattern of the State is given in Table 3.1.

Table 3.1 : Land use Pattern

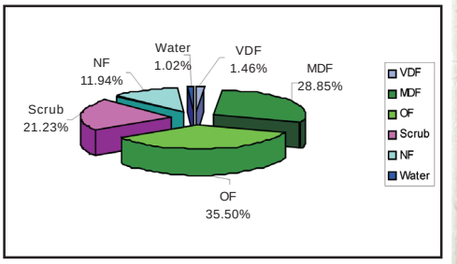
Land use	Area in Sqkm	Percentage
Forest including Scrub	55664.31	20.23
Agriculture	168821.46	61.37
Land with Scrub	17137.66	6.23
Fallow Lands	10333.94	3.76
Grasslands	652.17	0.24
Settlements	2633.41	0.96
Vegetation outside Forest	9132.87	3.32
Water Bodies	10343.00	3.76
Total	275068.00	100.00

(Source : NRSC)

The climate of this State is generally dry with temperature ranging from 8^0 C to 50^0 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 it comprises 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 84.7 million (2011 Census). The male population is 42.5 million and female 42.1 million. The Per capita forest area is **0.07 Ha**. The population density is 308 persons per Km^2. The livestock population is 150.5 million.

3.2 Recorded Forest Area:

The total notified forest area of the State is 63,814 Km^2, which is 23.2 % of the geographical area. Reserved, Protected and Un-classed forests occupy 50,478.63 Km^2 (79.10%), 12,365.34 Km^2 (19.38%) and 969.76 Km^2 (1.52%) of the total forest area respectively. The Khammam District has the highest notified forest area of 8,436.94 Km^2 and the Krishna has the lowest notified forest area of 664.28 Km^2 in the State. As regards the ratio of notified forest to geographical area, Khammam District has the highest



– 52.64 % and Nalgonda the lowest - 5.9 %. 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, Southern Thorn Forest, Dry Scrub Forest, Tropical Dry Evergreen Forest types.

3.3 Protected Area :

The State has 27 Protected Areas – 20 Wildlife Sanctuaries, 6 National Parks and 2 Tiger Reserves. Nagarjuna Sagar–Srisailam Tiger Reserve (NSTR) is the biggest Tiger Reserve of India and the Kawal Tiger Reserve in Adilabad District is the latest to be notified as Tiger Reserve in A.P. Out of 63814 Km^2 of notified forest area, 15280.92 Km^2 is included in the PA network.

3.4 Community Forest Management :

There are 7,718 Vana Samrakshana Samities (VSSs) or Joint Forest Protection Committees (JFPCs) in the State. An area of 15,199.8 Km^2 of notified forests, which is 23.8 % of the forest area, is under Community Forest Management (CFM). 15.39 Lakh members are involved in CFM. This includes 4.65 Lakh members belonging to Scheduled Tribes (S.Ts) and 3.23 Lakh members belonging to Scheduled castes (S.Cs).

3.5 Forest Cover :

The forest cover in the State based on the interpretation of IRS P6 LISS-III 2010 data (October 10 - March 11) is 42163.18 Km^2, which is 15.32% of the Geographical area. In terms of the forest canopy cover density classes the State has 931.73 Km^2 of Very Dense Forest, 18408.48 Km^2 of Moderately Dense Forest and 22651.28 Km^2 of Open Forest. The area of the Scrub is 13550.31 Km^2, Non-Forest 7622.49 Km^2 and Water Bodies 649.86 Km^2. The distribution of the forest cover of the State is shown in above pie chart and **Figure 3.1.**

The distribution of Forest Cover in the CFM areas is 76.78 Km^2 in Very Dense Forest, 3774.55 Km^2 in Moderately Dense Forest and 5402.96 Km^2 in Open Forest. The area of Scrub is 3797.88 Km^2, Non-Forest 2099.42 Km^2 and Water bodies 48.47 Km^2.

The distribution of Forest Cover in the Protected Areas is 208.37 Km^2 in Very Dense Forest, 3927.50 Km^2 in Moderately Dense Forest and 5907.76 Km^2 in Open Forest. The area of Scrub is 2919.79 Km^2, Non-Forest 1371.99 Km^2 & Water bodies 945.47 Km^2.

Change in Forest Cover (Including Scrub and Non-Forest): An analysis of the total extent of Forests between 2009 and 2010 shows that degradation is seen in an area of 69.99 Km^2 and positive change in 5.85 Km^2. Thus an area of 52.73 Km^2 of forests (5.48 Km^2 of MDF, 28.5 Km^2 of open forests and 18.75 $Km^2$of scrub) is converted to Non forest during the year.

On further analysis it is seen that out of this 52.73 Km^2 of loss of forest cover an area of 36.44 Km^2 is due to attempts on encroachments in the State and 16.29 Km^2 is due to harvesting of matured plantations and clearance of jungle growth for raising of plantations. The later are management interventions and hence cannot be considered as loss of forest cover. Hence loss of forest cover due to encroachments is taken as net loss of forest cover, which is 36.44 Km^2.Out of this an area of 9.57 Km^2 is inside VSS areas and 4.31 Km^2 inside the Protected Areas.

Encroachments were noticed in 34 Divisions, positive changes in 11 Divisions and no changes in 07 Divisions (Atmakur, Achampet, Nagarjuna Sagar, Nandyal, WLM Medak, Chittoor West, Karimnagar West).

Change in Forest Cover (Excluding Scrub and Non-Forest): The forest cover in VDF, MDF and OF in 2009 was 931.73 Km^2, 18418.53 Km^2 and 22686.57 Km^2 respectively. However in 2010 it is 931.73 Km^2, 18408.48 Km^2 and 22651.28 Km^2

respectively. Thus there was a reduction of 10.05 Km^2 in MDF and 35.29 Km^2 in OF. The net loss of forest cover in MDF and OF put together is 45.34 Km^2 in the State during the year.

Divisions with most loss of Forest Cover due to encroachments are Bhadrachalam South, Kothagudem, Khammam, Warangal South and Warangal North.

In **CFM areas**, there is a net loss of 10.84 Km^2 of forest cover. In Protected Areas, there is a net loss of 4.31 Km^2 of forest cover. The change locations are shown in **Figure 3.2.**

The forest cover change matrix, showing changes from one class to other, is given in Table 3.2. It reveals that there has been a decrease of 10.05 Km^2 of moderately dense forest and 35.29 Km^2 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 on encroachments triggered by recognition of rights of occupation.

Division wise forest cover in different forest canopy density classes along with the changes compared to 2009 assessment is given in **Table 3.3.**

Figure 3.1

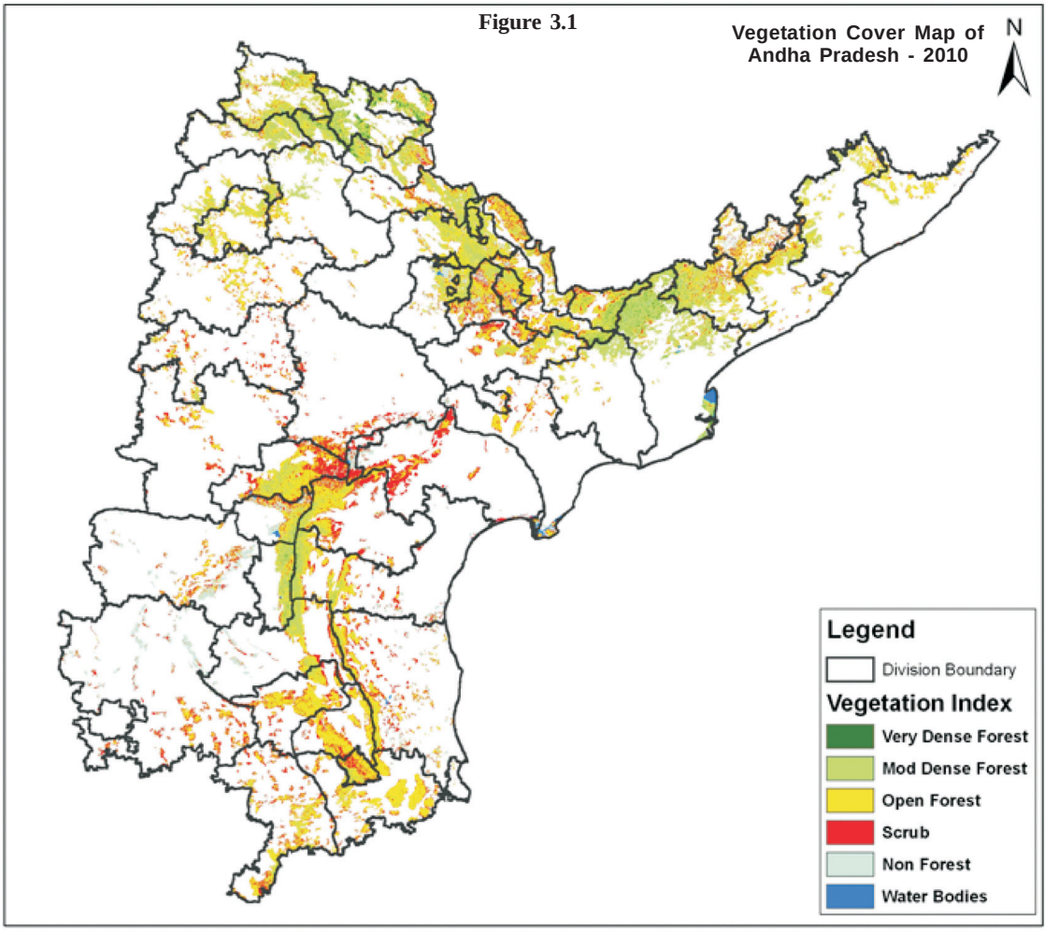
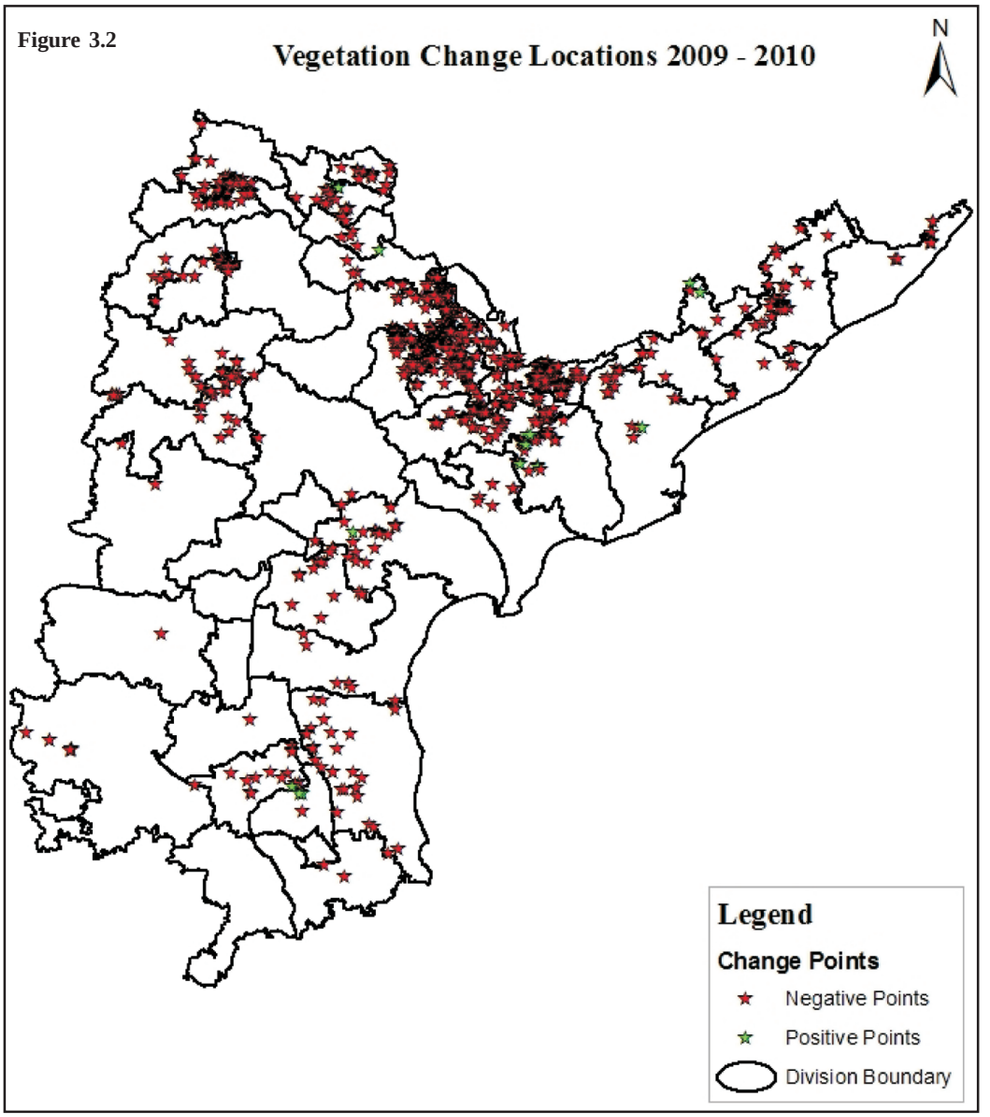


Figure 3.2



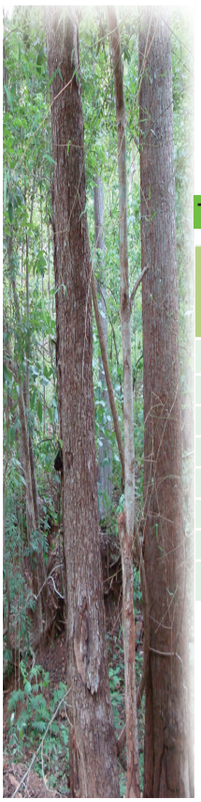


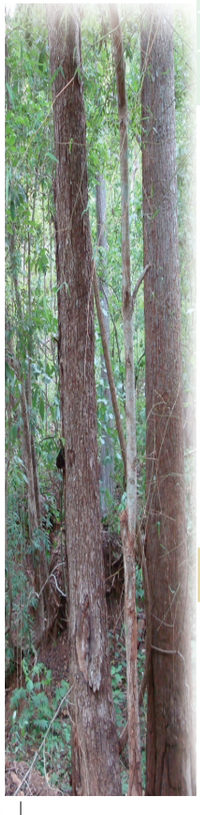
Table 3.2 Forest cover change matrix (Area in Km²)

2009 (Data of Dec 2009 - March 2010)	2010 (Data of Sep 2010 - Jan 2011)						Total of 2009
	VDF	MDF	OF	Scrub	NF	WB	
Very Dense Forest	931.73	0.00	0.00	0.00	0.00	0.00	931.73
Moderately Dense Forest	0.00	18408.32	0.45	4.28	5.48	0.00	18418.53
Open Forest	0.00	0.00	22645.54	11.99	28.50	0.54	22686.57
Scrub	0.00	0.13	1.02	13533.64	18.75	0.00	13553.54
Non-Forest	0.00	0.03	4.27	0.40	7569.76	0.00	7574.46
Water	0.00	0.00	0.00	0.00	0.00	649.32	649.32
Total of 2010	**931.73**	**18408.48**	**22651.28**	**13550.31**	**7622.49**	**649.86**	**63814.15**
Net Change	0.00	-10.05	-35.29	-3.23	48.03	0.54	

Table 3.3 Division wise Forest Cover Changes (Area in Km^2)

S.No & Division	VDF	MDF	OF	Scrub	NF	WB	Total	Encroa-chments
I. ADILABAD								
1.ADILABAD	52.31	925.03	337.82	382.16	194.26	7.37	**1898.95**	0.89
2.BELLAMPALLY	172.82	867.22	240.97	107.25	130.65	5.88	**1524.79**	0.15
3.JANNARAM	41.22	222.25	228.78	64.41	85.37	1.71	**643.74**	0.04
4.KAGAZNAGAR	159.17	377.26	162.05	75.33	116.39	3.09	**893.29**	0.31
5.MANCHERIAL	50.23	576.63	280.03	115.28	82.79	10.41	**1115.37**	0.00
6.NIRMAL	7.18	650.23	200.43	68.55	92.40	6.37	**1025.16**	0.59
Total	**482.93**	**3618.62**	**1450.08**	**812.98**	**701.86**	**34.83**	**7101.30**	**1.97**
II. ANANTHAPUR								
7.ANANTHAPUR	0.00	0.87	348.95	710.24	885.04	0.50	**1945.60**	0.00
8.CHITOOR WEST	0.03	197.72	962.68	646.34	280.62	2.37	**2089.76**	0.00
Total	**0.03**	**198.59**	**1311.63**	**1356.58**	**1165.66**	**2.87**	**4035.36**	**0.00**
III. FDPT SRISAILAM								
9.ACHAMPET	0.33	479.11	1032.14	782.23	69.60	59.96	**2423.37**	0.00
10.ATMAKUR	5.53	229.08	374.45	259.74	346.94	70.03	**1285.77**	0.00
11.MARKAPUR	1.93	372.31	951.35	685.04	247.73	14.50	**2272.86**	1.42
12.NAGARJUNASAGAR	0.00	8.49	181.98	441.72	133.29	29.50	**794.98**	0.00
Total	**7.79**	**1088.99**	**2539.92**	**2168.73**	**797.56**	**173.99**	**6776.98**	**1.42**
IV. GUNTUR								
13.GIDDALUR	22.10	746.57	729.07	444.58	260.57	5.31	**2208.20**	0.18
14.GUNTUR	0.00	0.08	315.19	887.62	235.76	38.26	**1476.91**	0.35
15.NELLORE	0.00	191.55	954.46	723.16	480.84	29.95	**2379.96**	0.04
Total	**22.10**	**938.20**	**1998.72**	**2055.36**	**977.17**	**73.52**	**6065.07**	**0.57**
V. HYDERABAD								
16.HYDERABAD	0.00	121.95	212.94	385.44	35.79	2.75	**758.87**	0.32
17.MAHABUBNAGAR	0.00	16.20	291.26	308.98	2.88	0.16	**619.48**	0.06
18.NALGONDA	0.00	1.57	38.35	241.36	158.36	2.36	**442.00**	0.03
Total	**0.00**	**139.72**	**542.55**	**935.78**	**197.03**	**5.27**	**1820.35**	**0.42**
VI.KHAMMAM								
19.BHADRACHALAM_N	9.26	377.05	545.93	368.15	131.44	3.74	**1435.57**	1.27
20.BHADRACHALAM_S	83.57	619.16	369.35	179.74	38.84	3.00	**1293.66**	5.41
21.KHAMMAM	0.41	349.97	507.73	355.00	106.65	2.58	**1322.34**	3.80
22.KOTHAGUDEM	0.04	353.96	584.54	451.79	290.04	3.51	**1683.88**	4.89
23.PALVONCHA	38.77	415.78	640.16	292.36	132.43	4.02	**1523.52**	2.35
24.PALVONCHA WLM	1.43	220.64	271.44	125.84	54.28	12.75	**686.38**	1.56
Total	**133.48**	**2336.56**	**2919.15**	**1772.88**	**753.68**	**29.60**	**7945.35**	**19.28**
VII KURNOOL								
25.KADAPA	0.03	164.81	973.38	484.76	91.25	2.32	**1716.55**	0.00
26.KURNOOL	0.00	0.56	269.09	364.04	565.97	2.89	**1202.55**	0.00
27.NANDYAL	40.71	595.10	293.98	67.67	65.57	3.43	**1066.46**	0.00
28.PRODDATUR	3.58	426.38	552.15	301.70	282.35	8.95	**1575.11**	0.00
Total	**44.32**	**1186.85**	**2088.60**	**1218.17**	**1005.14**	**17.59**	**5560.67**	**0.00**

VIII NIZAMABAD								
29.KAMAREDDY	0.00	327.40	489.38	85.07	75.44	4.00	**981.29**	0.37
30.MEDAK	0.00	92.65	495.50	279.77	45.98	2.68	**916.58**	0.90
31.MEDAK WLM	0.00	20.56	21.68	3.58	0.70	0.02	**46.54**	0.00
32.NIZAMABAD	0.00	309.20	310.12	80.37	82.12	5.32	**787.13**	1.19
Total	**0.00**	**749.81**	**1316.68**	**448.79**	**204.24**	**12.02**	**2731.54**	**2.46**
IX.RAJAHMUNDRY								
33.ELURU	0.00	512.15	156.55	53.41	50.32	0.59	**773.02**	1.45
34.KAKINADA	203.04	2355.89	220.21	185.66	101.53	169.06	**3235.39**	0.36
35.VIJAYAWADA	0.00	1.74	285.59	210.61	73.12	73.46	**644.52**	0.19
Total	**203.04**	**2869.78**	**662.35**	**449.68**	**224.97**	**243.11**	**4652.93**	**1.99**
X.VISHAKAPATNAM								
36.NARSIPATNAM	32.80	1084.21	755.94	244.93	235.54	0.33	**2353.75**	0.21
37.PADERU	1.91	140.21	398.83	234.67	235.79	0.11	**1011.52**	0.19
38.SRIKAKULAM	0.00	134.62	440.14	102.11	34.50	10.35	**721.72**	0.16
39.VISHAKAPATNAM	0.15	432.24	527.74	199.54	105.16	1.23	**1266.06**	0.24
40.VIZIANAGARAM	0.00	595.98	524.69	62.85	35.29	0.44	**1219.25**	0.85
Total	**34.86**	**2387.26**	**2647.34**	**844.10**	**646.28**	**12.46**	**6572.30**	**1.65**
XI. WARANGAL								
41.KARIMNAGAR EAST	0.00	657.93	413.59	258.72	50.31	6.26	**1386.81**	0.01
42.KARIMNAGAR WEST	0.00	501.42	336.27	120.31	14.69	1.78	**974.47**	0.00
43.WARANGAL NORTH	0.00	951.75	1013.41	91.80	246.56	6.73	**2310.25**	2.73
44.WARANGAL SOUTH	0.00	307.03	425.39	78.76	341.18	22.29	**1174.65**	2.90
45.WARANGAL_WLM	0.00	218.91	276.44	15.30	26.13	1.77	**538.55**	1.03
Total	**0.00**	**2637.04**	**2465.10**	**564.89**	**678.87**	**38.83**	**6384.73**	**6.66**
XII.WLM-TIRUPATHI								
46.CHITOOR EAST	0.02	114.71	1328.72	364.81	192.60	0.45	**2001.31**	0.02
47.WLM-TIRUPATHI	3.16	86.64	404.41	194.35	23.35	2.41	**714.32**	0.00
48.RAJAMPET	0.00	55.71	976.03	363.21	54.08	2.91	**1451.94**	0.00
Total	**3.18**	**257.06**	**2709.16**	**922.37**	**270.03**	**5.77**	**4167.57**	0.02
Grand Total	**931.73**	**18408.48**	**22651.28**	**13550.31**	**7622.49**	**649.86**	**63814.15**	**36.44**



"The clearest way into the Universe is through a forest wilderness." ~ John Muir

CHAPTER - IV

FOREST DIVISION - WISE RESULTS

Nallamala forest

Chamala forest

East Godavari forest

4.1 ADILABAD DIVISION

4.1.1 Introduction:

Adilabad Forest Division lies in Northern Part of Adilabad District between latitudes 19^0 9' 50'' and 19^0 54' 59'' N and longitudes 78^0 7' 28'' and 79^0 5' 37'' E. The Geographical Area of the Division is 4409.41 Km^2 which constitutes 27.34 % of the total area of the District. The highest hill ranges are situated in the southeast corner of the Division. They are Kuchanpally 646M above MSL and Tummidipally gutta 634M above MSL. The important rivers of the Division are Kadam , Penuganga and Peddavagu; which are tributaries of Godavari.

Land use pattern of the Division is given in Table 4.1.1

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

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

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

Table 4.1.1: Land use Pattern

Land use	Area in SqKm	Percentage
Forest including Scrub	1699.55	38.54
Agriculture	2153.17	48.83
Land with Scrub	293.57	6.66
Fallow Lands	84.42	1.91
Grasslands	0.00	0.00
Settlements	20.03	0.46
Vegetation outside Forest	108.2	2.46
Water Bodies	50.47	1.14
Total	**4409.41**	

4.1.2 Recorded Forest Area:

The notified forest area of the Division is 1830.35 Km^2 which is 41.51 % of the geographical area. The area under Reserved, Protected and Un-classed Forests is 996.47 Km^2 (54.45%), 820.32 Km^2 (44.8%) and 13.56 Km^2 (0.7%) respectively.

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

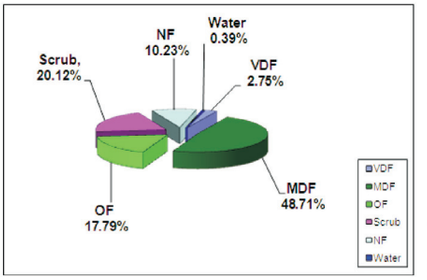
4.1.3 Protected Area:

There is no Protected Area in the Division.

4.1.4 Community Forest Management:

There are 390 Vana Samrakshana Samities (VSSs) or Joint Forest Protection Committees (JFPCs) in the Division. An area of 359.34 Km^2 forests, which is 21.06 % of the notified forests, is under the management of the VSSs.

Fig 4.1.1



4.1.5 Forest Cover:

The forest cover in the Division based on the interpretation of IRS P6 LISS III 2010 data (Dec 2010) is **1315.16 Km^2** which is 29.83% of the

Geographical area. In terms of the forest canopy density classes the Division has 52.31Km^2 of Very Dense Forests, 925.03Km^2 of Moderately Dense Forests and 337.82 Km^2 of Open Forests. The area of the Scrub is 382.16 Km^2, Non-Forest 194.26Km^2 and Water Bodies 7.37 Km^2. The distribution of the forest cover of the Division is shown in Fig 4.1.1

4.1.6 Change in Forest Cover:

The Satellite images of 2009 and 2010 have been shown in Fig (4.1.2 & 4.1.3) and the changes between this period are shown on the image of 2010.

Comparison of the current forest cover with that of previous assessment year shows a **negative change of 84.99 Ha**. The forest cover change matrix given in Table 4.1.2 reveals that there is a decrease of 25.88 Ha of moderately dense forest and 59.11 Ha of open forest.

The total Negative change (including scrub) is 92.62 Ha in which 3.59 Ha is on account of diversion of forest land for non-forestry purpose and 89.03 Ha is on account of encroachments. Diversion of forest land is to be compensated and hence not considered as loss of forest cover. Therefore the negative change on account of encroachment alone is taken as loss of forest cover. Hence the **net loss of forest cover in the Division is 89.03 Ha** only.

Fig 4.1.2

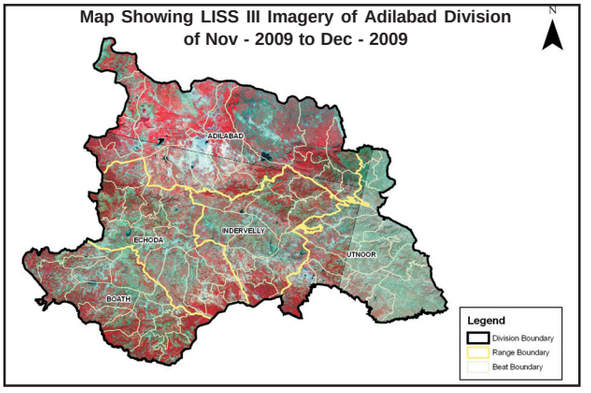
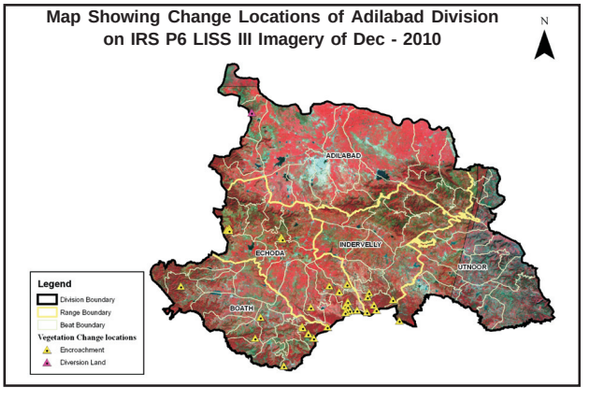
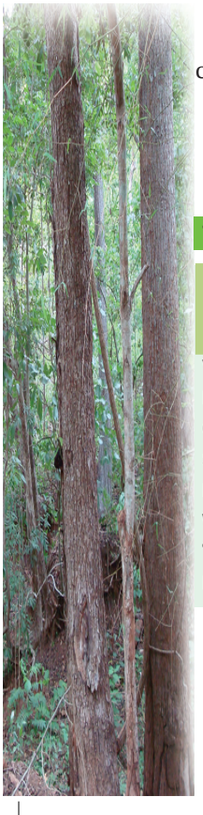


Fig 4.1.3





There are 75 Beats in the Division. Negative changes in forest cover are noticed in 17 Beats only. There are no changes in the remaining 58 Beats.

Details of forest cover changes in the 17 Beats mentioned above are shown in Table 4.1.3.

Table 4.1.2: Forest Cover change matrix (Area in Km^2)

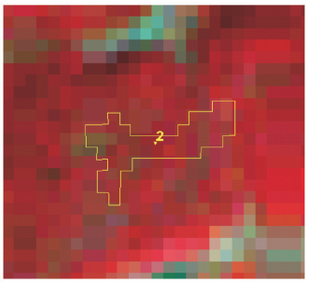
2009	2010						Total of 2009
	VDF	MDF	OF	Scrub	NF	WB	
Very Dense Forest	52.31	0.00	0.00	0.00	0.00	0.00	**52.31**
Moderately Dense Forest	0.00	925.03	0.00	0.26	0.00	0.00	**925.29**
Open Forest	0.00	0.00	337.82	0.37	0.18	0.04	**338.41**
Scrub	0.00	0.00	0.00	381.53	0.08	0.00	**381.61**
Non-Forest	0.00	0.00	0.00	0.00	194.00	0.00	**194.00**
Water	0.00	0.00	0.00	0.00	0.00	7.33	**7.33**
Total of 2010	**52.31**	**925.03**	**337.82**	**382.16**	**194.26**	**7.37**	**1898.95**
Net Change	0.00	-0.26	-0.59	0.55	0.26	0.04	

Table 4.1.3: List of Beats with negative change in Forest Cover (Area in ha)

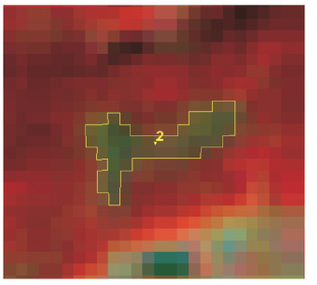
Beat	VDF	MDF	OF	Scrub	NF	WB	Total	Net Change	Encroachments
ADILABAD RANGE									
Arli(S)	0.00	217.63	300.04	257.12	411.08	3.59	1189.46	-3.59	0.00
Total	**0.00**	**217.63**	**300.04**	**257.12**	**411.08**	**3.59**	**1189.46**	**-3.59**	**0.00**
BOATH RANGE									
Arepally	1.12	1411.60	612.25	729.30	560.52	0.00	3314.79	-2.63	2.63
Marlapally	0.00	3221.21	1536.62	489.41	608.72	3.20	5859.16	-2.60	2.60
Neradigonda	0.00	647.94	383.45	684.18	452.94	0.00	2168.51	-3.16	3.16
Pisra	18.32	2023.76	406.94	249.52	180.57	37.08	2916.19	-26.11	26.11
Wadoorpet	0.00	965.42	619.21	428.49	520.80	0.00	2533.92	-2.32	2.32
Total	**19.44**	**8269.93**	**3558.47**	**2580.90**	**2323.55**	**40.28**	**16792.57**	**-36.82**	**36.82**
ECHODA RANGE									
Dedra	0.00	2094.28	752.69	788.84	1415.71	0.01	5051.53	-6.65	6.65
Dignoor	0.00	408.22	198.89	497.59	395.69	0.00	1500.39	-3.53	3.53
Madhapur	185.75	864.61	290.25	532.63	49.58	0.01	1922.83	-2.31	2.31
Sirchalma	47.69	1976.58	249.24	595.11	59.04	3.38	2931.04	-7.52	7.52
Sirkonda	22.33	692.87	221.32	831.72	131.31	0.01	1899.56	-2.97	2.97
Talamadri	128.90	1260.04	203.39	672.81	53.88	0.00	2319.02	-1.78	1.78
Waipet	14.60	1571.83	310.87	608.42	126.65	0.00	2632.37	-12.90	12.90
Total	**399.27**	**8868.43**	**2226.65**	**4527.12**	**2231.86**	**3.41**	**18256.74**	**-37.66**	**37.66**
INDERVELLY RANGE									
Pochampally(S)	32.63	1734.40	611.97	1036.36	194.07	43.17	3652.60	-2.56	2.56
Shampur	85.94	1833.56	776.11	1022.21	175.69	66.40	3959.91	-1.50	1.50
Waipet[South]	2.75	2558.32	387.78	412.25	62.92	162.46	3586.48	-8.51	8.51
Total	**121.32**	**6126.28**	**1775.86**	**2470.82**	**432.68**	**272.03**	**11198.99**	**-12.57**	**12.57**
UTNOOR RANGE									
Utnoor	133.72	3460.72	916.89	237.83	229.44	3.80	4982.40	-1.98	1.98
Total	**133.72**	**3460.72**	**916.89**	**237.83**	**229.44**	**3.80**	**4982.40**	**-1.98**	**1.98**
Grand Total	**673.75**	**26942.99**	**8777.91**	**10073.79**	**5628.61**	**323.11**	**52420.16**	**-92.62**	**89.03**

Satellite Images

2009



2010



Longitude	78.31368^0 E
Latitude	19.5138^0 N
Area in Ha	2.35
Change	MDF to Scrub
Compt No	121
Beat	Dedra
Range	Echoda
Division	Adilabad

Adilabad Circle

4.2 BELLAMPALLY DIVISION

4.2.1 Introduction:

Bellampalli Forest Division lies in Adilabad District between latitudes 18^0 56' 16'' and 19^0 36' 58'' N and longitudes 78^0 56' 8'' and 79^0 56' 53'' E. Geographical Area of the Division is 3293.30km^2 which is 20.41 % of the area of the District. The terrain is undulating with a fringe of low hills in different directions. The general elevation of hill ranges varies from 125 M to 570 M above MSL. Deccan gutta is the highest peak with an elevation of 633 m above MSL.

Land use pattern of the Division is given in Table 4.2.1

The temperature varies from 15^0C to 40^0C. The average annual rainfall of the Division is 1051 mm received mainly from south-west monsoons.

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

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

Table 4.2.1: Land use Pattern

Land use	Area in SqKm	Percentage
Forest including Scrub	1392.19	42.27
Agriculture	1563.56	47.48
Land with Scrub	141.66	4.30
Fallow Lands	7.24	0.22
Grasslands	0.10	0.00
Settlements	11.68	0.36
Vegetation outside Forest	95.62	2.90
Water Bodies	81.25	2.47
Total	**3293.3**	

The population of the Division is 0.40 million (2011 Census). The per capita forest area is 0.37 Ha. The population density is 116 persons per Km^2.

4.2.2 Recorded Forest Area:

The area of notified forests of the Division is **1540.56 Km^2** which is 46.77 % of the geographical area. Reserved, Protected and un-classed forests comprise of 1337.74 Km^2 (86.8 %), 163.58 Km^2 (10.64%) and 39.24 Km^2 (2.5 %) of the forest area respectively.

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

4.2.3 Protected Area:

There is no Protected Area in the Division.

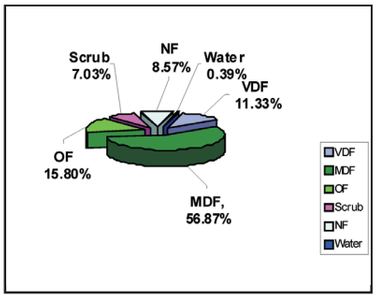
4.2.4 Community Forest Management:

There are 228 Vana Samrakshana Samities (VSSs) or Joint Forest Protection Committees (JFPCs) in the Division. An area of 206.92Km^2 forests, which is 13.43% 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 P6 LISS III 2010 data (Oct/Dec 2010) is **1281.01 Km^2** which is 38.89% of the geographical area. In terms of the forest canopy density classes the Division has 172.82 Km^2 of

Fig 4.2.1



Very Dense Forests, 867.22 Km^2 of Moderately Dense Forests and 240.97 Km^2 of Open Forests. The area of the Scrub is 107.25 Km^2, Non-Forest 130.65 Km^2 and Water Bodies 5.88 Km^2. The distribution of the forest cover of the Division is shown in Fig 4.2.1

4.1.6 Change in Forest Cover:

The Satellite images of 2009 and 2010 are shown in Figures (4.2.2 & 4.2.3) and the changes between this period are shown on the image of 2010.

Comparison of the current forest cover with that of previous assessment year shows a **positive change of 51.08 Ha** and **negative change of 164.30 Ha**. The forest cover change matrix given in Table 4.2.2 reveals that there is a decrease of 10.42 Ha of moderately dense forest and 102.80 Ha of open forest and 23.24 Ha of scrub.

The positive change is 51.08 Ha on account of growth in raised plantations. The total negative change (including scrub) is 195.98 Ha. Out of this 168.94 Ha is on account of harvesting of plantations, 11.83 Ha is on account of diversion of forest land for non-forestry purposes and 15.21 Ha on account of encroachments. As harvesting of plantations and diversion of forests are Forest management interventions and hence not considered as loss of forest cover. Thus only the negative change due to encroachments is taken as loss of forest cover. Therefore the **net loss of forest cover is 15.21 Ha** only.

Fig 4.2.2

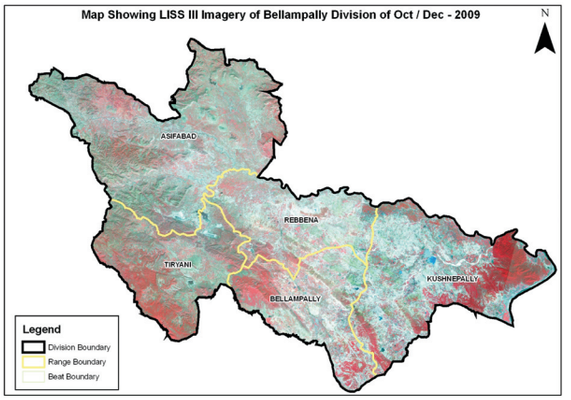
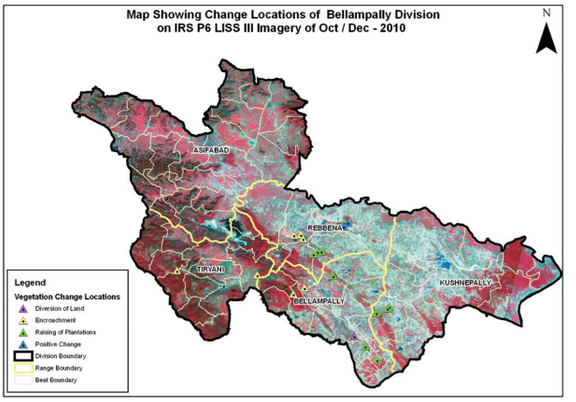


Fig 4.2.3



There are 60 Beats in the Division. Negative changes in forest cover are noticed in 10 Beats and positive change in 1 Beat. There are no changes in remaining 49 Beats.

Details of forest cover changes in the 11 Beats mentioned above are shown in Table 4.2.3.

Table 4.2.2: Forest Cover change matrix (Area in Km^2)

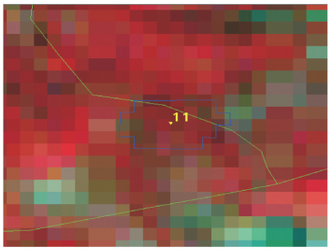
2009	2010						Total of 2009
	VDF	MDF	OF	Scrub	NF	WB	
Very Dense Forest	172.82	0.00	0.00	0.00	0.00	0.00	**172.82**
Moderately Dense Forest	0.00	867.09	0.00	0.05	0.19	0.00	**867.33**
Open Forest	0.00	0.00	240.59	0.17	1.24	0.00	**242.00**
Scrub	0.00	0.13	0.00	107.03	0.32	0.00	**107.48**
Non-Forest	0.00	0.00	0.38	0.00	128.90	0.00	**129.28**
Water	0.00	0.00	0.00	0.00	0.00	5.88	**5.88**
Total of 2010	**172.82**	**867.22**	**240.97**	**107.25**	**130.65**	**5.88**	**1524.79**
Net Change	0.00	-0.11	-1.03	-0.23	1.37	0.00	

Table 4.2.3: List of Beats with change in Forest Cover (Area in Ha)

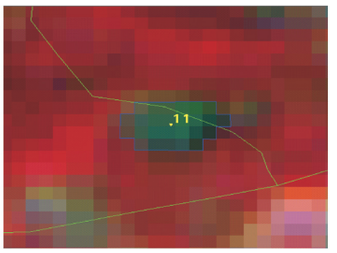
Beat	VDF	MDF	OF	Scrub	NF	WB	Total	Net Change	Encroachments
BELLAMPALLI RANGE									
Bellampally	2.36	656.11	590.58	590.64	894.86	7.10	2741.65	-11.83	0.00
Madaram	431.86	1066.47	294.78	108.18	73.10	0.00	1974.39	-2.96	2.96
Murliguda	574.92	1699.13	289.43	141.64	122.82	0.00	2827.94	-1.74	1.74
Narwaipet	4.14	717.01	559.89	184.60	552.14	16.81	2034.59	-23.63	0.00
Tandur	34.66	513.95	317.51	122.93	124.71	1.10	1114.86	-6.56	0.00
Total	**1047.94**	**4652.67**	**2052.19**	**1147.99**	**1767.63**	**25.01**	**10693.43**	**-46.72**	**4.70**
KUSHNEPALLY RANGE									
Rangapet	60.08	993.47	402.04	435.14	1077.04	56.50	3024.27	-84.12	0.00
Total	**60.08**	**993.47**	**402.04**	**435.14**	**1077.04**	**56.50**	**3024.27**	**-84.12**	**0.00**
REBBENA RANGE									
Dharmaram	0.00	144.06	901.68	392.14	1439.02	2.40	2879.30	24.27	0.00
Rebbena	20.27	579.02	253.06	305.24	276.18	3.99	1437.76	-7.35	7.35
Takkallapally	122.02	625.04	244.11	128.96	218.76	4.93	1343.82	-27.82	0.00
Total	**142.29**	**1348.12**	**1398.85**	**826.34**	**1933.96**	**11.32**	**5660.88**	**-10.90**	**7.35**
TIRYANI RANGE									
Gopera	300.54	2705.62	213.01	261.70	69.39	5.84	3554.69	-1.41	1.41
Kannepally	530.76	2214.49	304.87	63.70	46.16	0.00	3159.98	-1.75	1.75
Total	**831.30**	**4920.11**	**517.88**	**325.40**	**115.55**	**5.84**	**6714.67**	**-3.16**	**3.16**
Grand Total	**2081.61**	**11914.37**	**4370.96**	**2734.87**	**4894.18**	**98.67**	**26093.25**	**-144.90**	**15.21**

Satellite Images

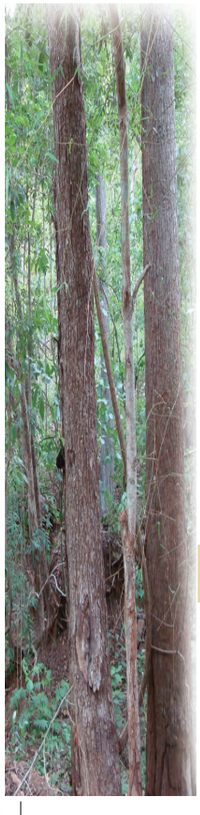
2009



2010



Longitude	79.151 99^0 E
Latitude	19.18023^0 N
Area in Ha	1.42
Change	MDF to Scrub
Compt No	156
Beat	Gopera
Range	Tiryani
Division	Bellampally



"Forests may be gorgeous but there is nothing more alive than a tree that learns how to grow in a cemetery."

4.3 JANNARAM WLM DIVISION

4.3.1 Introduction:

Jannaram WLM Forest Division lies in the central portion of Adilabad District between latitudes 18^0 55' 21'' and 19^0 21' 5'' N and longitudes 78^0 45' 10'' and 79^0 14' 5'' E. Geographical Area of the Division is 925.27Km^2 which is 5.7 % of the area of the District. The northwestern corner of this Division is Birsaipet plateau which is 396 M above MSL. This plateau is all undulating and drains from either side into Peddavagu stream which runs across the plateau from north-east to south-west.

Land use pattern of the Division is given in Table 4.3.1

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

In this Division about 30 seasonal streams are identified. The area serves as a catchment for many streams, which drain into Kadem reservoir and Godavari River. There are a large number of small, medium and big tanks scattered through out the Division inside and outside the Reserve Forest.

Red soils are extensive, followed by Black soils. Alluvial and laterite soils are found occasionally to a small extent.

Table 4.3.1: Land use Pattern

Land use	Area in SqKm	Percentage
Forest including Scrub	631.29	68.23
Agriculture	236.33	25.54
Land with Scrub	9.53	1.03
Fallow Lands	3.91	0.42
Grasslands	0.00	0.00
Settlements	13.03	1.41
Vegetation outside Forest	13.90	1.50
Water Bodies	17.28	1.87
Total	**925.27**	

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

4.3.2 Recorded Forest Area:

The notified forest area of the Division is **617.94 Km^2** which is 66.78 % of the geographical area. Reserved and Protected Forests constitute 80.82 Km^2 (13.2 %) and 537.12 Km^2 (86.8 %) of the forest area respectively.

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

4.3.3 Protected Area:

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

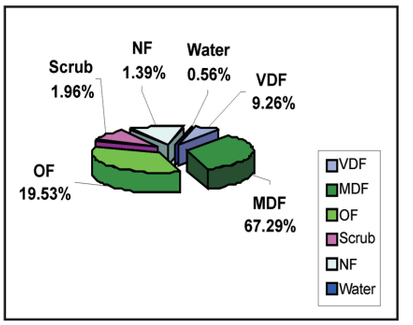
4.3.4 Community Forest Management:

There are 75 Vana Samrakshana Samities (VSSs) or Joint Forest Protection Committees (JFPCs) in the Division. An area of 122.02 Km^2 forests which is 19.74 % of 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 P6 LISS III 2010 data (Dec 10) is **618.51 Km²** which is 66.85 % of the Geographical area. In terms of the forest canopy density classes the Division has 41.22 Km² of Very Dense Forests, 222.25 Km² of Moderately Dense Forests and 228.78 Km² of Open Forests. The area of the Scrub is 64.41 Km², Non-Forest 85.37 Km² and Water Bodies 1.71 Km². 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 the Division of 2009 and 2010 are shown in Figures 4.3.2 & 4.3.3 respectively and the changes during this period are shown on the image of 2010.

Comparison of the current forest cover with that of previous assessment year shows a **negative change in forest cover of 3.61 Ha**. The forest cover change matrix given in Table 4.3.2 reveals that this decrease is in Open forest.

The entire negative change of 3.61Ha is on account of encroachments. Therefore the **net loss of forest cover is 3.61 Ha**.

Fig 4.3.2

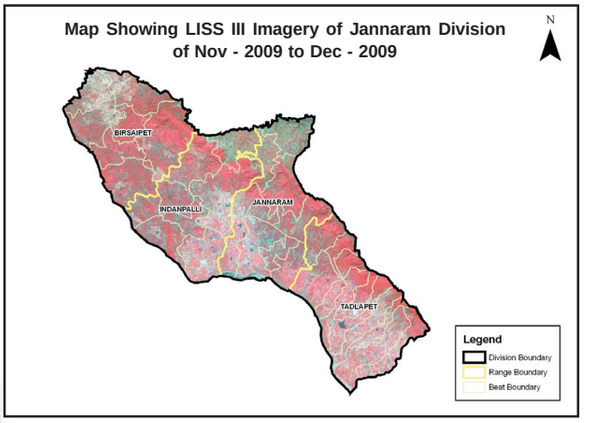
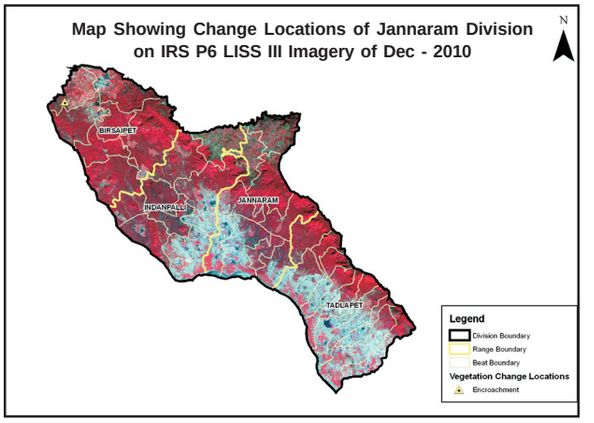


Fig 4.3.3



There are 34 Beats in the Division. Negative change in forest cover is noticed only in 1 Beat. There are no changes in the remaining 33 Beats.

Details of forest cover change in the 1 Beat, viz., Dantanpalli West is shown in Table 4.3.3.

Table 4.3.2: Forest Cover change matrix (Area in Km²)

2009	2010						Total of 2009
	VDF	MDF	OF	Scrub	NF	WB	
Very Dense Forest	41.22	0.00	0.00	0.00	0.00	0.00	**41.22**
Moderately Dense Forest	0.00	222.25	0.00	0.00	0.00	0.00	**222.25**
Open Forest	0.00	0.00	228.78	0.04	0.00	0.00	**228.82**
Scrub	0.00	0.00	0.00	64.37	0.00	0.00	**64.37**
Non-Forest	0.00	0.00	0.00	0.00	85.37	0.00	**85.37**
Water	0.00	0.00	0.00	0.00	0.00	1.71	**1.71**
Total of 2010	**41.22**	**222.25**	**228.78**	**64.41**	**85.37**	**1.71**	**643.74**
Net Change	0.00	0.00	-0.04	0.04	0.00	0.00	

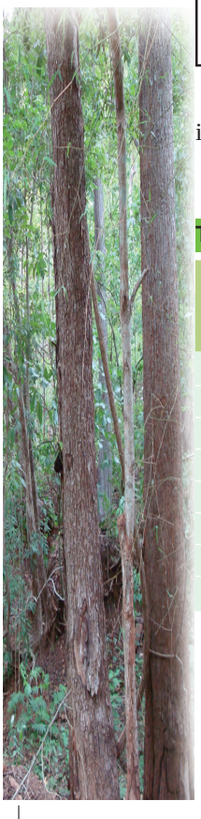


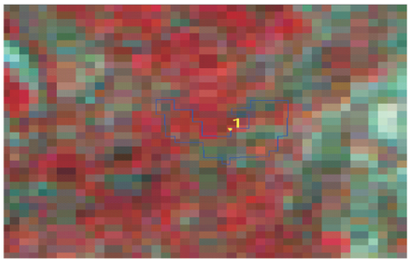
Table 4.3.3: List of Beats with change in Forest Cover

(Area in Ha)

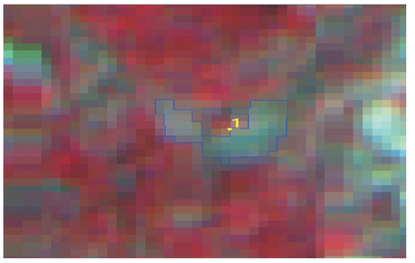
Beat	VDF	MDF	OF	Scrub	NF	WB	Total	Net Change	Encroa-chments
Birsaipet Range									
Dantanpalli-w	9.34	167.01	87.66	31.37	1104.19	0.00	1399.57	-3.61	3.61
Total	**9.34**	**167.01**	**87.66**	**31.37**	**1104.19**	**0.00**	**1399.57**	**-3.61**	**3.61**

Satellite Images

2009



2010



Longitude	78.77562^0 E
Latitude	19.3032^0 N
Area in Ha	3.61
Change	OF to Scrub
Compt No	4
Beat	Dantanpalli - W
Range	Birsaipet
Division	Jannaram

Adilabad Circle

4.4 KAGAZNAGAR DIVISION

4.4.1 Introduction:

Kagaz Nagar Forest Division lies in the North Eastern side of Adilabad District between latitudes 19^0 11' 51'' and 19^0 36' 20''N and longitudes 79^0 22' 28'' and 79^0 58' 21'' E. Geographical area of the Division is 1645.83 Km^2 which is 10.20% of the area of the District. The important rivers and streams of the Division are Wardha, Pranahitha and Peddavagu; which finally join River Godavari.

Land use pattern of the Division is given in Table 4.4.1

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

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

The total population of the Division is 0.25 million (2011 Census). The Per capita forest area is 0.35 ha. The population density is 155 persons per Km^2.

Table 4.4.1: Land use Pattern

Land use	Area in SqKm	Percentage
Forest including Scrub	777.61	47.25
Agriculture	706.05	42.90
Land with Scrub	73.15	4.44
Fallow Lands	11.61	0.71
Grasslands	0.00	0.00
Settlements	8.51	0.52
Vegetation outside Forest	34.68	2.10
Water Bodies	34.22	2.08
Total	**1645.83**	

4.4.2 Recorded Forest Area:

The notified forest area of the Division is **858.81 Km^2** which is 52.18 % of the geographical area. Reserved, Protected and Un-classed Forests constitute 650.62 Km^2 (75.74 %), 206.58 Km^2 (24 %) and 1.61 Km^2 (0.18 %) of the forest area respectively.

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

4.4.3 Protected Area:

There is no Protected Area in the Division.

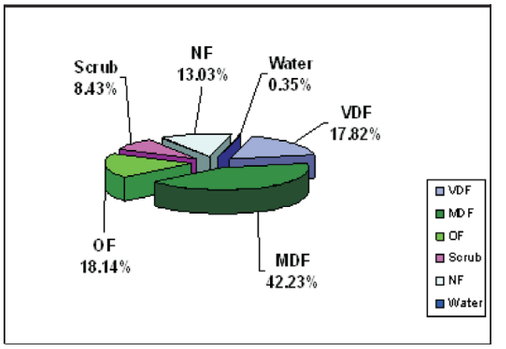
4.4.4 Community Forest Management:

There are 113 Vana Samrakshana Samities (VSSs) in the Division. 148.42 Km^2 forest area, which is 17.27% of the forest area, is under the management of the VSSs.

4.4.5 Forest Cover:

The forest cover in the Division, based on the interpretation of IRS P6 LISS III 2010 data (Oct-Dec 10) is **698.48 Km^2** which is 42.43 % of the Geographical area. In terms of the forest canopy density classes, the Division has 159.17 Km^2 of Very Dense Forests, 377.26 Km^2 of Moderately Dense Forests and 162.05 Km^2 of Open Forests. The area of the Scrub is 75.33 Km^2, Non-Forests 116.39 Km^2 and Water Bodies 3.09 Km^2. 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 2009 and 2010 are shown in Figures 4.4.2 & 4.4.3 respectively and the changes during this period are shown on the image of 2010.

Comparison of the current forest cover with that of previous assessment year shows a **negative change of 108.91 Ha**. The forest cover change matrix given in Table 4.4.2 reveals that there is a decrease of 44.70 Ha of moderately dense forest and 64.21 Ha of open forest.

The negative change of 27.35 Ha is on account of clearance of jungle growth for raising of plantations, 50.47 Ha on account of diversion of forest land for non-forestry purposes and 31.09 Ha is on account of encroachments. As raising of plantations and diversion of forest land are forest management interventions; the same are not considered as loss of forest cover. Thus only the negative change due to encroachment is taken as loss of forest cover, which is 31.09 Ha only.

Fig 4.4.2

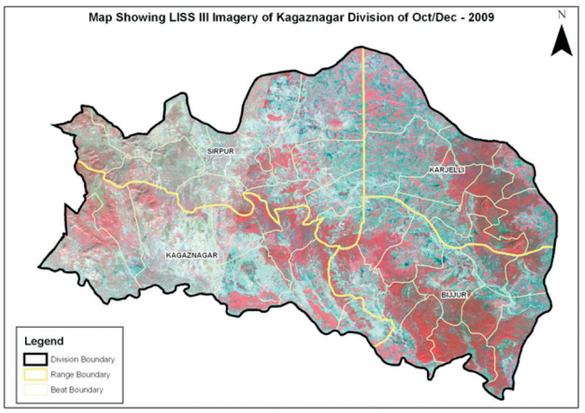
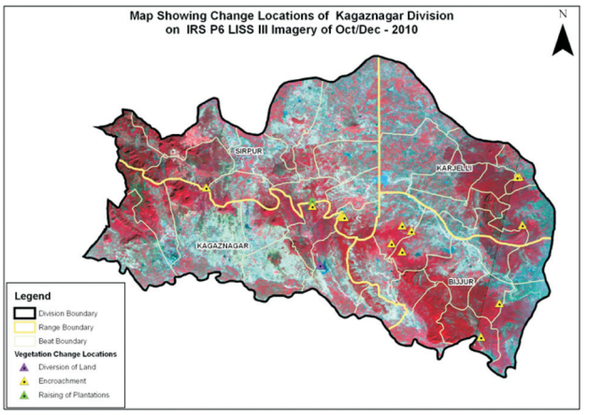


Fig 4.4.3



There are 39 Beats in the Division. Negative changes in forest cover are noticed in 11 Beats. There are no changes in remaining 28 Beats.

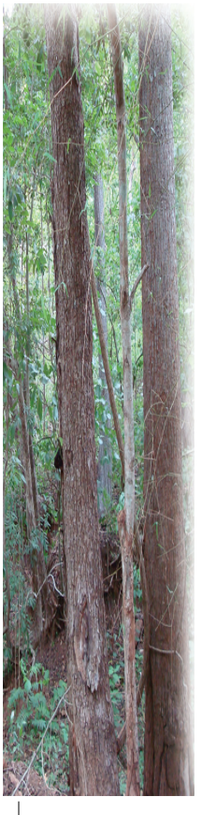
Details of forest cover changes in the 11 Beats mentioned above are shown in Table 4.4.3

Table 4.4.2: Forest Cover change matrix (Area in Km²)

2009	2010						Total of 2009
	VDF	MDF	OF	Scrub	NF	WB	
Very Dense Forest	159.17	0.00	0.00	0.00	0.00	0.00	**159.17**
Moderately Dense Forest	0.00	377.26	0.00	0.12	0.32	0.00	**377.70**
Open Forest	0.00	0.00	162.05	0.10	0.04	0.50	**162.69**
Scrub	0.00	0.00	0.00	75.11	0.00	0.00	**75.11**
Non-Forest	0.00	0.00	0.00	0.00	116.03	0.00	**116.03**
Water	0.00	0.00	0.00	0.00	0.00	2.59	**2.59**
Total of 2010	**159.17**	**377.26**	**162.05**	**75.33**	**116.39**	**3.09**	**893.29**
Net Change	0.00	-0.44	-0.64	0.22	0.36	0.50	

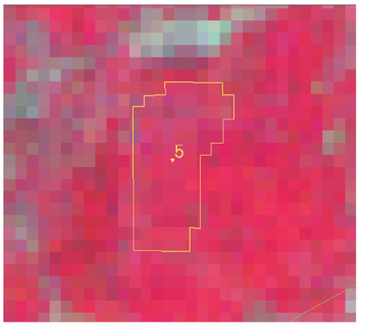
Table 4.4.3: List of Beats with change in Forest Cover (Area in Ha)

Beat	VDF	MDF	OF	Scrub	NF	WB	Total	Net Change	Encroachments
BIJJUR RANGE									
Gundepally	902.80	1431.62	604.44	172.46	49.23	23.18	3183.73	-0.95	0.95
Kuntalamanepally	353.25	924.17	93.54	98.60	519.81	5.32	1994.69	-8.10	8.10
Papanpet	300.14	1051.93	385.33	258.17	129.56	14.78	2139.91	-0.92	0.92
Sulgupally	282.41	1183.69	102.90	84.13	508.45	21.36	2182.94	-1.52	1.52
Total	**1838.60**	**4591.41**	**1186.21**	**613.36**	**1207.05**	**64.64**	**9501.27**	**-11.49**	**11.49**
KAGAZNAGAR RANGE									
Chedwai	706.40	1208.64	572.86	256.26	378.00	63.80	3185.96	-50.47	0.00
Kadamba	1104.87	1455.20	399.42	76.93	197.10	0.00	3233.52	-4.96	4.96
Total	**1811.27**	**2663.84**	**972.28**	**333.19**	**575.10**	**63.80**	**6419.48**	**-55.43**	**4.96**
KARJELLI RANGE									
Dimda	78.94	649.56	207.43	365.10	393.98	30.48	1725.49	-1.87	1.87
Gudem	176.43	1029.83	966.19	843.08	362.27	0.01	3377.81	-3.06	3.06
Total	**255.37**	**1679.39**	**1173.62**	**1208.18**	**756.25**	**30.49**	**5103.30**	**-4.93**	**4.93**
SIRPUR RANGE									
Bhupal_Patnam	167.37	708.48	443.38	159.92	114.14	0.01	1593.30	-27.35	0.00
Cheelapally	660.92	2791.59	690.38	131.49	278.52	1.86	4554.76	-2.84	2.84
Rebbena	449.73	792.23	231.97	121.19	267.86	9.06	1872.04	-6.87	6.87
Total	**1278.02**	**4292.30**	**1365.73**	**412.60**	**660.52**	**10.93**	**8020.10**	**-37.06**	**9.71**
Grand Total	**5183.26**	**13226.94**	**4697.84**	**2567.33**	**3198.92**	**169.86**	**29044.15**	**-108.91**	**31.09**

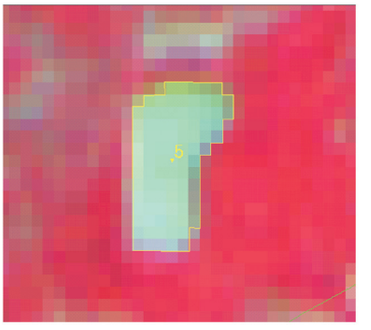


Satellite Images

2009



2010



Longitude	79.66538^0 E
Latitude	19.41545^0 N
Area in Ha	4.96
Change	MDF to NF
Compt No	121
Beat	Kadamba
Range	Kagaznagar
Division	Kagaznagar

4.5 MANCHERIAL DIVISION

4.5.1 Introduction:

Mancherial Forest Division lies in the south-eastern part of Adilabad District between latitudes 18^0 40' 10'' and 19^0 8' 42'' N and longitudes 79^0 10' 15'' and 79^0 57' 53'' E. Geographical area of the Division is 2328.55 Km^2 which is 14.4% of the area of the District. The elevation of hill ranges varies from 135 M – 540 M above MSL. The highest point in the Division is 556 M above MSL. Godavari and Pranahita are the major rivers of the Division. River Pranahita forms eastern boundary- and the River Godavari forms southern boundary of the Division.

Land use pattern of the Division is given in Table 4.5.1

The temperature varies from 15^0C to 40^0C. The average annual rainfall of the Division is 1100mm received mainly from south-west monsoon.

Table 4.5.1: Land use Pattern

Land use	Area in SqKm	Percentage
Forest including Scrub	1026.02	44.06
Agriculture	983.23	42.22
Land with Scrub	115.78	4.97
Fallow Lands	63.42	2.72
Grasslands	0.00	0.00
Settlements	13.76	0.59
Vegetation outside Forest	65.25	2.81
Water Bodies	61.1	2.63
Total	**2328.56**	

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

Population of the Division is 0.56 million (2011 Census), per capita forest area is 0.20 Ha and the population density is 261 persons per Km^2.

4.5.2 Recorded Forest Area:

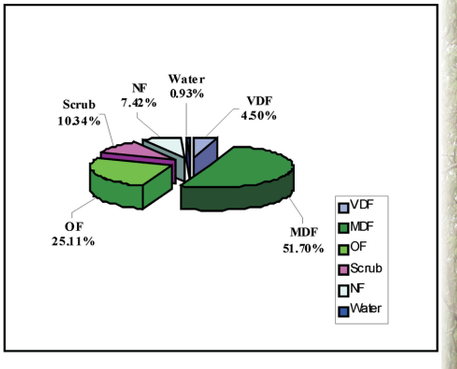
The notified forest area of the Division is **1205.83 Km^2** which is 51.85 % of the geographical area. Reserved, Protected and Un-classed Forests constitute 1180.64 Km^2 (97.92 %), 24.09 Km^2 (0.0199 %) and 1.10 Km^2 (0.09 %) of the forest area respectively.

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

4.5.3 Protected Area:

There are 2 Protected Areas in the Division. The first one is Pranahita Wild Life Sanctuary with an area of 68.37 Km^2 or 2.9% of the geographic area of the Division. The second one is a part of Shivaram Wild Life Sanctuary which includes 2 Beats of the Division with an area of 14.23 km^2.

Fig. 4.5.1.



4.5.4 Community Forest Management:

There are 113 Vana Samrakshana Samities (VSSs) in the Division. 137.67 Km^2 or 11.41 % of notified forest area is under the management of VSSs.

4.5.5 Forest Cover:

The forest cover in the Division based on the interpretation of IRS P6 LISS III 2010 data (Oct 2010-Dec 2010) is **906.89 Km^2** which is 38.95 % of

the Geographical area. In terms of the forest canopy density classes, the Division has 50.23 Km^2 of Very Dense Forests, 576.63 Km^2 of Moderately Dense Forests and 280.03 Km^2 of Open Forests. The area of the Scrub is 115.28 Km^2, Non-Forest 82.79 Km^2 and Water Bodies 10.41 Km^2. 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 2009 and 2010 are shown in Figures 4.5.2 & 4.5.3 respectively and the changes during this period are shown on the image of 2010.

Comparison of the current forest cover with that of previous assessment year shows a **negative change of 63.68 Ha**. The forest cover change matrix given in Table 4.5.2 reveals that there is a decrease of 51.44 Ha of moderately dense forest, 12.24 Ha of open forest and 51.36 Ha of Scrub.

The entire negative change (including scrub) of 115.04 Ha is on account of clearance of growth for raising of plantations. As clearance of growth for raising of plantations is a forest management intervention, the same is not considered as loss of forest cover. Therefore, there is **no net loss of forest cover**.

Fig : 4.5.2

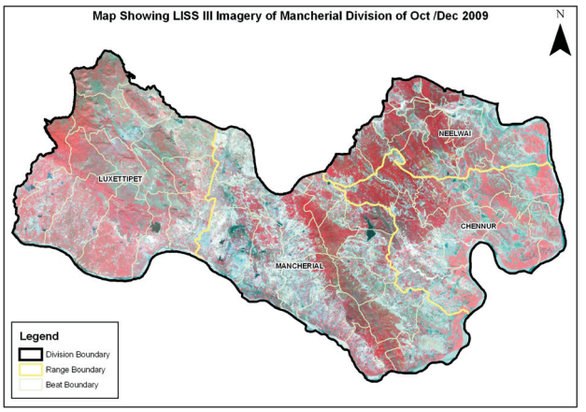
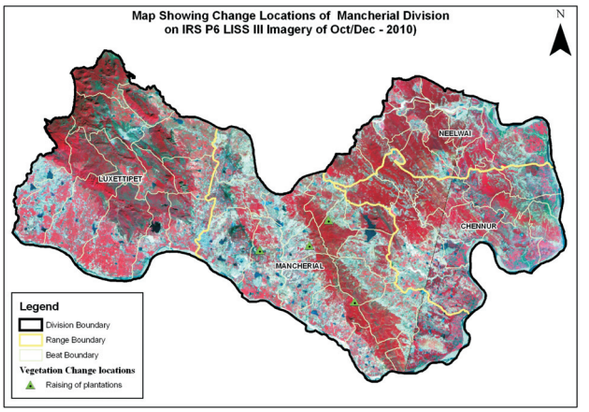


Fig : 4.5.3



There are 50 Beats in the Division. Negative changes in the forest cover are noticed in 4 Beats only. There are no changes in remaining 46 Beats.

Details of forest cover changes in the 4 Beats mentioned above are shown in Table 4.5.3

Table 4.5.2: Forest Cover change matrix (Area in km^2)

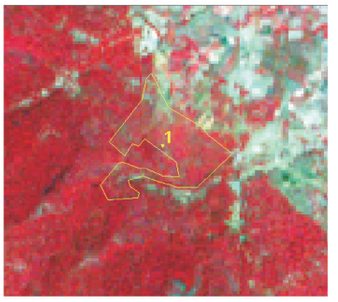
2009	2010						Total of 2009
	VDF	MDF	OF	Scrub	NF	WB	
Very Dense Forest	50.23	0.00	0.00	0.00	0.00	0.00	**50.23**
Moderately Dense Forest	0.00	576.63	0.00	0.00	0.51	0.00	**577.14**
Open Forest	0.00	0.00	280.43	0.00	0.12	0.00	**280.55**
Scrub	0.00	0.00	0.00	114.88	0.52	0.00	**115.40**
Non-Forest	0.00	0.00	0.00	0.00	81.64	0.00	**81.64**
Water	0.00	0.00	0.00	0.00	0.00	10.41	**10.41**
Total of 2010	**50.23**	**576.63**	**280.43**	**114.88**	**82.79**	**10.41**	**1115.37**
Net Change	0.00	-0.51	-0.12	-0.52	1.15	0.00	

Table 4.5.3: List of Beats with negative change in Forest Cover (Area in Ha)

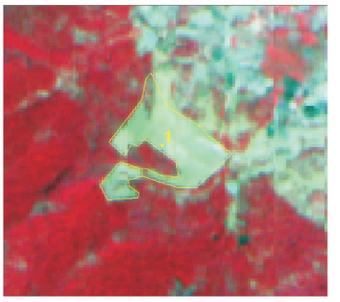
Beat	VDF	MDF	OF	Scrub	NF	WB	Total	Net Change	Encroachments
MANCHERIAL RANGE									
Dampur	0.00	1443.32	309.22	23.44	73.60	0.00	1849.58	-51.44	0.00
Indaram	0.00	441.30	769.01	503.89	520.53	0.16	2234.89	-12.24	0.00
Jaipur	5.23	568.43	313.81	112.47	159.33	7.07	1166.34	-11.57	0.00
Kundaram	2.42	1298.98	543.17	22.07	174.30	0.00	2040.94	-39.79	0.00
Total	**7.65**	**3752.03**	**1935.21**	**661.87**	**927.76**	**7.23**	**7291.75**	**-115.04**	**0.00**
Grand Total	**7.65**	**3752.03**	**1935.21**	**661.87**	**927.76**	**7.23**	**7291.75**	**-115.04**	**0.00**

Satellite Images

2009



2010



Longitude	79.62469^0 E
Latitude	18.90144^0 N
Area in Ha	51.44
Change	MDF to NF
Compt No	73
Beat	Dampur
Range	Mancherial
Division	Mancherial

A nation that destroys its soils destroys itself. Forests are the lungs of our land, purifying the air and giving fresh strength to our people.
~ Franklin D. Roosevelt

Adilabad Circle

4.6 NIRMAL DIVISION

4.6.1 Introduction:

Nirmal Forest Division lies in the south-western part of Adilabad District between latitudes 18^0 50' 39'' and 19^0 20' 31''N and longitudes 77^0 45' 45'' and 78^0 56' 34'' E. Geographical area of the Division is 3525.62 Km^2 which is 21.8% of the area of the District. Godavari is the major river of the Division and forms its southern boundary. Siddha and Kaddam are other important rivers, which are tributaries of River Godavari.

Land use pattern of the Division is given in Table 4.6.1

The temperature varies from 15^0C to 40^0C. The normal Annual rainfall of the Division is 800 mm received mainly from south-west monsoons.

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

Population of the Division is 0.69 million (2011 Census), per capita forest area is 0.15 Ha and the population density is 209 persons per Km^2.

Table 4.6.1: Land use Pattern

Land use	Area in SqKm	Percentage
Forest including Scrub	927.25	26.30
Agriculture	1951.56	55.35
Land with Scrub	81.76	2.32
Fallow Lands	75.74	2.15
Grasslands	0.46	0.01
Settlements	32.49	0.92
Vegetation outside Forest	144.85	4.11
Water Bodies	311.52	8.84
Total	**3525.63**	

4.6.2 Recorded Forest Area:

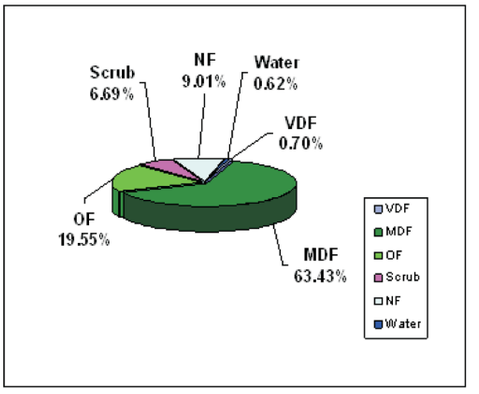
The total notified forest area of the Division is **1178.4 Km^2**, which is 33.42 % of the total geographical area. Reserved, Protected and Un-classed Forests Constitute 354.57 Km^2 (30%), 743.17 Km^2 (63%) and 80.66 Km^2 (7%) of the total forest area respectively.

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

4.6.3 Protected Area:

A part of the Kawal Wildlife Sanctuary & Tiger Reserve, with an area of 315.01 km^2 of notified forests or 30.27 % of Division Forest area; is included in the Division.

Fig 4.6.1



4.6.4 Community Forest Management:

There are 205 Vana Samrakshana Samities (VSSs) in the Division. An area of 282.48 Km^2 forests, which is 23.97 % 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 P6 LISS III 2010 data (Dec 2010) is **857.84 Km^2** which is 24.33 % of the geographical area. In terms of the forest canopy density classes the Division has 7.18 Km^2 of Very Dense Forests, 650.23 Km^2 of Moderately

Dense Forests and 200.43 Km^2 of Open Forests. The area of the Scrub is 68.55 Km^2, Non-Forest 92.40 Km^2 and Water Bodies 6.37 Km^2. The distribution of the forest cover of the Division is shown in Fig 4.6.1

4.6.6 Change in Forest Cover:

The Satellite images of 2009 and 2010 are shown in Fig 4.6.2 & Fig 4.6.3 respectively and the changes during this period are shown on the image of 2010.

Comparison of the current forest cover with that of previous assessment year shows a **negative change in forest cover of 76.24 Ha**. The forest cover change matrix given in Table 4.6.2 reveals that there is a decrease of 53.57 Ha of moderately dense forest and 22.67 Ha of open forest.

Negative change (including scrub) of 1.16 Ha is on account of diversion of forest land for non-forestry purpose, 16.55 Ha is on account of clearance of growth for raising of plantations and 58.53 Ha is on account of encroachments. As diversion of forest land and clearance of growth for raising of plantations are management interventions and hence not considered as loss of forest cover. Therefore the negative change on account of encroachment is considered as loss of forest cover. Therefore, the **net loss of forest cover is 58.53 Ha** in the Division.

Fig 4.6.2

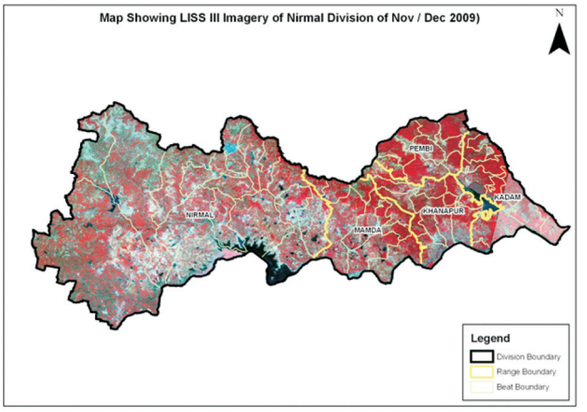
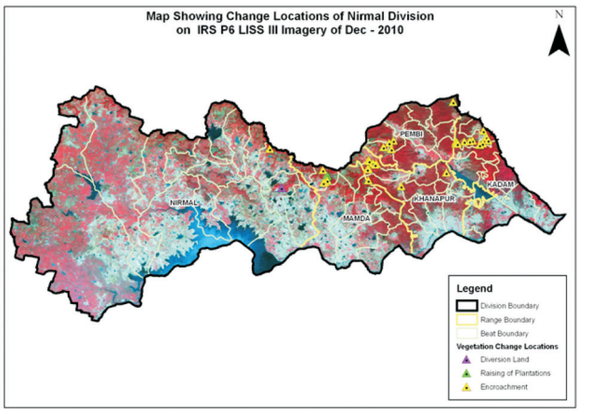


Fig 4.6.3



There are 56 Beats in the Division. Negative changes in forest cover are noticed in 13 Beats. There are no changes in the remaining 43 Beats.

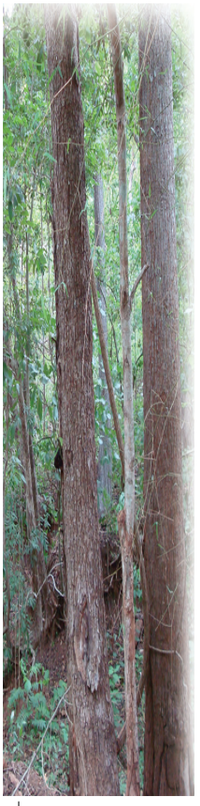
Details of forest cover changes in these 43 Beats are shown in Table 4.6.3.

Table 4.6.2: Forest Cover change matrix (Area in Km^2)

2009	2010						Total of 2009
	VDF	MDF	OF	Scrub	NF	WB	
Very Dense Forest	7.18	0.00	0.00	0.00	0.00	0.00	**7.18**
Moderately Dense Forest	0.00	650.23	0.04	0.44	0.06	0.00	**650.77**
Open Forest	0.00	0.00	200.39	0.20	0.03	0.00	**200.62**
Scrub	0.00	0.00	0.00	67.91	0.00	0.00	**67.91**
Non-Forest	0.00	0.00	0.00	0.00	92.31	0.00	**92.31**
Water	0.00	0.00	0.00	0.00	0.00	6.37	**6.37**
Total of 2010	**7.18**	**650.23**	**200.43**	**68.55**	**92.40**	**6.37**	**1025.16**
Net Change	0.00	-0.54	-0.19	0.64	0.09	0.00	

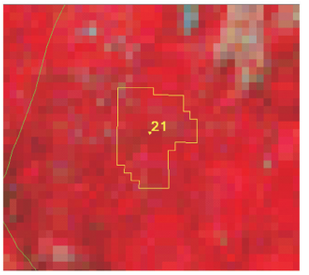
Table No: 4.6.3 List of Beats with negative change in Forest Cover (Area in Ha)

Beat	VDF	MDF	OF	Scrub	NF	WB	Total	Net Change	Encroachments
KADAM RANGE									
Alampally_east	50.11	1866.77	248.20	55.72	188.62	0.00	2409.41	-8.64	8.64
Alampally_west	5.53	1648.19	491.54	27.10	84.85	11.63	2268.84	-13.81	13.81
Total	**516.79**	**14268.18**	**3655.83**	**648.84**	**948.43**	**273.39**	**20311.48**	**-22.45**	**22.45**
KHANAPUR RANGE									
Nagapur	19.32	2026.00	184.09	3.04	4.55	3.79	2240.79	-1.90	1.90
Pochampally	4.97	1056.40	322.75	74.57	229.78	0.16	1688.63	-11.28	11.28
Rajura	1.13	1314.01	133.47	24.32	70.81	9.33	1553.07	-4.10	4.10
Singapur	12.01	1557.02	218.68	17.41	28.85	12.47	1846.44	-1.86	1.86
Somwarpet	2.40	1149.44	203.03	51.87	228.81	26.22	1661.77	-1.47	1.47
Total	**73.30**	**14886.05**	**2492.96**	**338.02**	**898.03**	**131.76**	**18820.10**	**-20.61**	**20.61**
MAMDA RANGE									
Medpally	0.00	1480.81	197.14	128.96	152.88	3.09	1962.88	-21.84	5.29
Total	**29.06**	**10349.91**	**3939.84**	**1852.91**	**1150.51**	**118.20**	**17440.42**	**-21.84**	**5.29**
NIRMAL RANGE									
Chincholi	0.00	817.19	209.69	94.13	50.45	5.78	1177.24	-1.16	0.00
Dhani	0.00	1146.72	266.52	159.94	85.14	11.40	1669.72	-1.62	1.62
Total	**0.00**	**9403.53**	**5067.90**	**3347.05**	**4555.58**	**54.63**	**22428.72**	**-2.78**	**1.62**
PEMBI RANGE									
Domdhari	4.08	2736.56	690.55	37.78	179.63	49.73	3698.33	-2.82	2.82
Paspula	17.00	2682.75	331.17	75.36	280.93	0.00	3387.21	-3.30	3.30
Raidhari	61.40	1495.83	291.99	127.65	308.80	0.00	2285.67	-2.44	2.44
Total	**98.38**	**16169.38**	**4905.25**	**604.49**	**1678.75**	**59.09**	**23515.30**	**-8.56**	**8.56**
Division Total	**717.53**	**65077.05**	**20061.78**	**6791.31**	**9231.30**	**637.05**	**102516.02**	**-76.24**	**58.53**

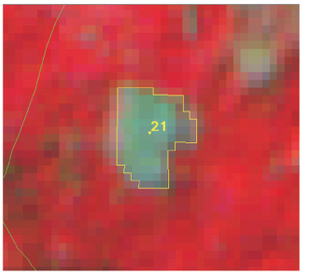


Satellite Images

2009



2010



Longitude	78.53494^0 E
Latitude	19.17899^0 N
Area in Ha	5.61
Change	MDF to NF
Compt No	799
Beat	Pochampally
Range	Khana Pur
Division	Nirmal

4.7 ANANTHAPUR DIVISION

4.7.1 Introduction:

Ananthapur Forest Division lies in the South Western part of Andhra Pradesh state between latitudes 13^{0}40'52.32" and 15^{0}14'0.24"N and longitudes 76^{0}45'39.96" and 78^{0}28'14.52"E. The Geographical Area of the Division (and the District) is 19130 Km^2. 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 hillier. 6 rivers flow within the district. These are Penna, Chithravathi, Vedavathi, Papagni, Swarnamuki and Thadakaleru.

Land use pattern of the Division is given in Table 4.7.1

The climate of this Division is generally dry with temperatures ranging from 20^{0}C to 40^{0}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 the District to drought in the district leading to failure of crops.

Table 4.7.1: Land use Pattern

Land use	Area in SqKm	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
Total	**19130.00**	

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 Anantpur 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^2. The livestock population is 8.25 million.

4.7.2 Recorded Forest Area:

Area of the notified forests of the Division is **1969.78 Km^2** which is 10.3% of the geographical area. Reserved, Protected and Un-classed Forests constitute 1921.48 Km^2 (77.64%), 14.73 Km^2 (15.55%) and 33.57 Km^2 (6.81%) of the total forest area respectively.

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

4.7.3 Protected Area:

There are no Protected Areas in the Division

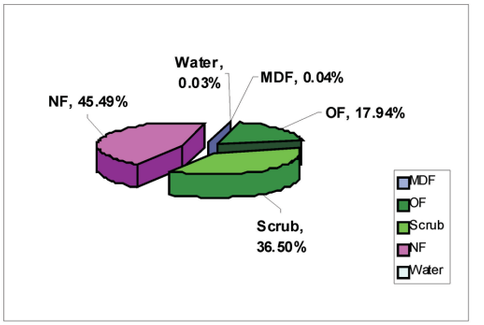
4.7.4 Community Forest Management:

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

4.7.5 Forest Cover:

The forest cover in the Division based on the Interpretation of IRS P6 LISS III 2010 data (Nov 2010– Jan 2011) is **349.82 Km²** which is 1.83% of the Geographical area. In terms of the forest canopy density classes the Division has 0.87 Km² of Moderately Dense Forests and 348.95 Km² of Open Forests. The area of the Scrub is 710.24 Km², Non-Forest 885.04 Km² and Water Bodies 0.50Km². 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 2009 and 2010 are shown in Fig 4.7.2 & Fig 4.7.3 respectively and the changes during this period are shown on the image of 2010.

Comparison of the current forest cover with that of previous assessment year shows **no negative change in dense and open forest**. The forest cover change matrix given in Table 4.7.2 reveals that there is a decrease of 26.13 Ha in scrub which is on account of clearance of jungle growth for raising of plantations and since it is a forest management intervention the same is not considered as loss of forest cover. Therefore there is no net loss of forest cover in the Division.

The forest cover change matrix is given in Table 4.7.2

Fig 4.7.2

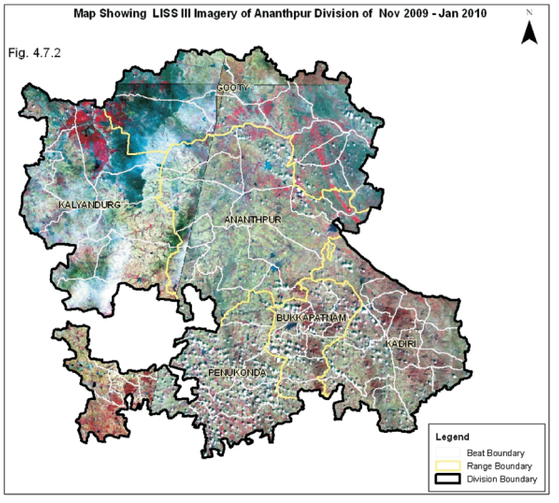
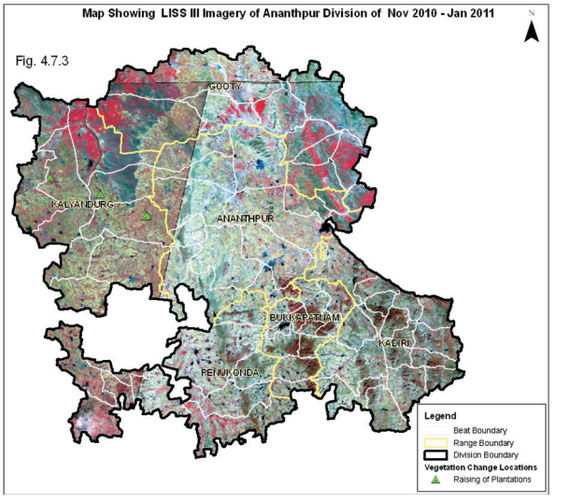
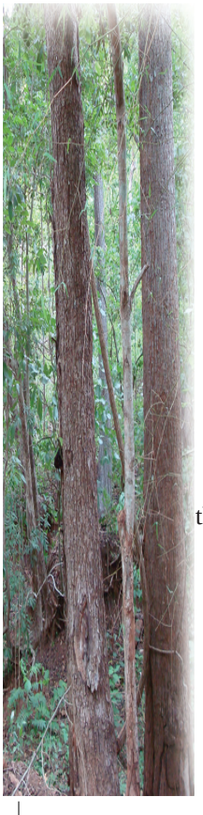


Fig 4.7.3





There are 72 Beats in the Division. Negative changes in forest cover are noticed in 3 Beats. There are no changes in the remaining 69 Beats.

Details of forest cover changes in the 3 Beats are shown in Table 4.7.3.

Table 4.7.2: Forest Cover change matrix (Area in Km^2)

2009	2010						Total of 2009
	VDF	MDF	OF	Scrub	NF	WB	
Very Dense Forest	0.00	0.00	0.00	0.00	0.00	0.00	**0.00**
Moderately Dense Forest	0.00	0.87	0.00	0.00	0.00	0.00	**0.87**
Open Forest	0.00	0.00	348.95	0.00	0.00	0.00	**348.95**
Scrub	0.00	0.00	0.00	710.24	0.26	0.00	**710.50**
Non-Forest	0.00	0.00	0.00	0.00	884.78	0.00	**884.78**
Water	0.00	0.00	0.00	0.00	0.00	0.50	**0.50**
Total of 2010	**0.00**	**0.87**	**348.95**	**710.24**	**885.04**	**0.50**	**1945.60**
Net Change	0.00	0.00	0.00	-0.26	0.26	0.00	

Table 4.7.3: List of Beats with negative change in Forest Cover (Area in Ha)

Beat	VDF	MDF	OF	Scrub	NF	WB	Total	Net Change	Encroachments
KALYANDURG RANGE									
Beluguppa	0.00	0.00	13.94	321.31	854.02	0.72	1,189.99	-4.93	0.00
Dharmapuri	0.00	0.00	99.95	1,103.08	1,398.73	0.00	2,601.76	-10.66	0.00
Kalyanadurg	0.00	0.00	37.57	984.42	2,083.36	0.00	3,105.35	-10.54	0.00
Total	**0.00**	**0.00**	**151.46**	**2,408.81**	**4,336.11**	**0.72**	**6,897.10**	**-26.13**	**0.00**
Grand Total	**0.00**	**0.00**	**151.46**	**2,408.81**	**4,336.11**	**0.72**	**6,897.10**	**-26.13**	**0.00**

Ananthapur Circle

4.8 CHITTOOR WEST DIVISION

4.8.1 Introduction:

Chittoor West Forest Division lies in the Southern Part of Andhra Pradesh state between latitudes 12^0 37' 22" and 13^0 59' 37.76"N and longitudes 78^0 40' 12" and 79^0 08' 35.52" E. Geographical area of the Division is 7944 Km^2 which is 52.32% of the geographical area of the District. Terrain can be roughly divided in to 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 305M on plains to 1377M on the hills. One of the prominent hills in the Division is Horsley Hills 1314M above MSL.

Land use pattern of the Division is given in Table 4.8.1

The climate of the Division is equable, healthy and pleasant. The temperatures ranging from 12^0C to 38^0C 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^2.

Table 4.8.1: Land use Pattern

Land use	Area in SqKm	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
Total	**7944.00**	

4.8.2 Recorded Forest Area:

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

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

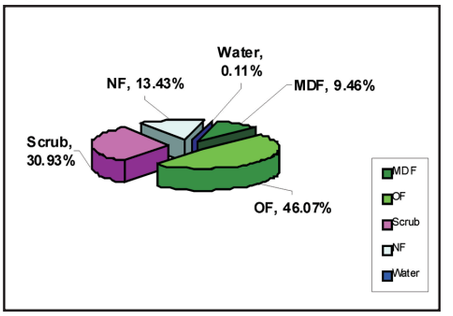
4.8.3 Protected Area:

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

4.8.4 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^2 forests which is 10.8% of the notified forests is under the management of the VSSs.

Fig 4.8.1



4.8.5 Forest Cover:

The forest cover in the Division, based on the interpretation of IRS P6 LISS III 2010 data (Jan 2011) is **1160.43 Km^2** which is 14.61% of the

Geographical area. In terms of forest canopy cover density classes the Division has 0.03 Km^2 of Very Dense Forests, 197.72 Km^2 of Moderately Dense Forests and 962.68 Km^2 of Open Forests. The area of the Scrub is 646.34Km^2, Non-Forest 280.62 Km^2 and Water Bodies 2.37 Km^2. The distribution of the forest cover of the Division is shown in Fig 4.8.1.

4.8.6 Change in Forest Cover:

The Satellite images of 2009 and 2010 are shown in Fig 4.8.2 and Fig 4.8.3 respectively.

Comparison of the current forest cover with that of previous assessment year does not show any change in the forest cover. The forest cover change matrix is given in Table 4.8.2.

Fig : 4.8.2

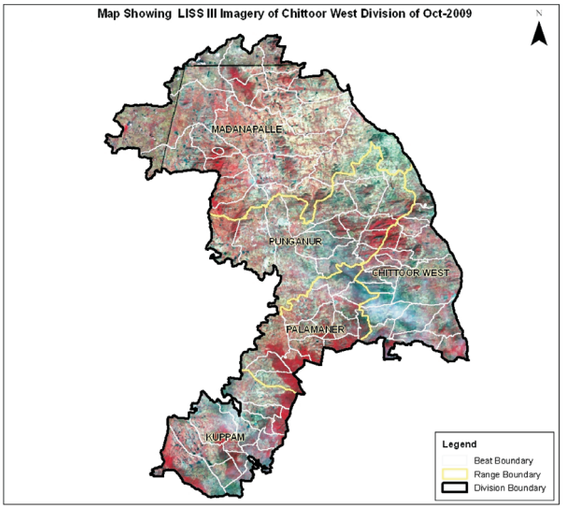
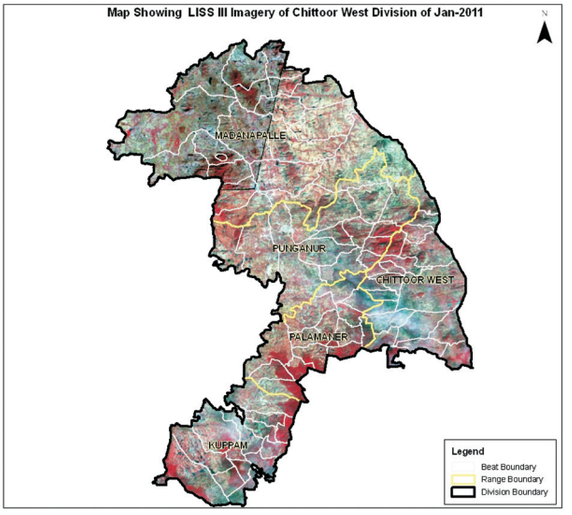


Fig : 4.8.3



There are 84 Beats in the Division. There is no change in the forest cover in any of the Beats.

Table 4.8.2: Forest Cover change matrix (Area in Km^2)

2009	2010						Total of 2009
	VDF	MDF	OF	Scrub	NF	WB	
Very Dense Forest	0.03	0.00	0.00	0.00	0.00	0.00	**0.03**
Moderately Dense Forest	0.00	197.72	0.00	0.00	0.00	0.00	**197.72**
Open Forest	0.00	0.00	962.68	0.00	0.00	0.00	**962.68**
Scrub	0.00	0.00	0.00	646.34	0.00	0.00	**646.34**
Non-Forest	0.00	0.00	0.00	0.00	280.62	0.00	**280.62**
Water	0.00	0.00	0.00	0.00	0.00	2.37	**2.37**
Total of 2010	**0.03**	**197.72**	**962.68**	**646.34**	**280.62**	**2.37**	**2089.76**
Net Change	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Srisailam Circle

4.9 ACHAMPET WLM DIVISION

4.9.1 Introduction:

Achampet WLM Forest Division lies in the south eastern part of Mahabubnagar District between latitudes 16^0 08' 50'' and 16^0 37' 45'' N and longitudes 78^0 4' 30'' and 78^0 58' 50'' E. The Geographical Area of the Division is 4303.47 Km^2, which is 23.35 % of the geographical area of the District. The Division has two physiographic zones, the Amrabad plateau of Nallamalai hills having an altitude of 500 to 876 M and the plains having an altitude of 200 to 500 M. The River Krishna forms Southern boundary of the Division as well as the District. Major tributaries of Krishna falling in Division are Dindi, Bhumunikolanu vagu, Nallavagu, Buggavagu and Yemulapayavagu.

Land use pattern of the Division is given in Table 4.9.1

The climate of this Division is generally dry with temperatures ranging from 15^0C to 41^0C. The annual rainfall is about 700 mm received mainly from Southwest monsoons.

Srisailam quartzite occupies most part of the Division. The soil types found mainly are Black cotton, Red and Brown sandy loam.

The total population of the Division is 0.49 million (2011 Census) which constitutes 12.25 % of the total population of the District. The per capita forest area is 0.49 Ha. The population density is 106 persons per Km^2. The livestock population is 4.82 million.

Table 4.9.1: Land use Pattern

Land use	Area in SqKm	Percentage
Forest including Scrub	2293.29	53.29
Agriculture	804.03	18.68
Land with Scrub	236.07	5.49
Fallow Lands	102.87	2.39
Grasslands	127.72	2.97
Settlements	4.03	0.09
Not available for cultivation	645.24	14.99
Water Bodies	90.22	2.10
Total	**4303.47**	

4.9.2 Recorded Forest Area:

The notified forest area of the Division is **2423.36 Km^2**, which is 56.31% of the geographical area. Extents of Reserved, Protected and Un-classed forests are 1881.51 Km^2 (77.64%), 376.72 Km^2 (15.55%) and 165.03 Km^2 (6.81%) respectively of the total forest area.

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

4.9.3 Protected Area:

The Division is one of the 4 constituent Divisions of Nagarjuna Sagar–Srisailam Tiger Reserve (NSTR). Out of 2,423.36 Km^2 of forest area an area of 1750 Km^2 is included in the NSTR.

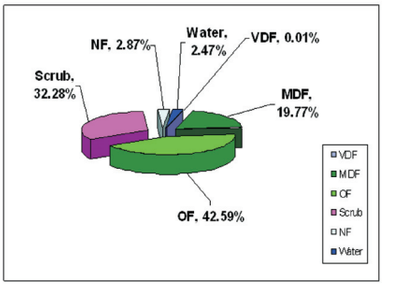
4.9.4 Community Forest Management:

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

4.9.5 Forest Cover:

The forest cover in the Division based on the interpretation of IRS P6 LISS III 2010 data (Oct 2010-Dec 2010) is **1511.58 Km²** which is 35.13% of the Geographical area. In terms of the forest canopy density classes the Division has 0.33 Km² of Very Dense Forests, 479.11 Km² of Moderately Dense Forests and 1032.14 Km² of Open Forests. The area of the Scrub is 782.23 Km²,that of Non-Forest 69.60 Km² and Water Bodies 59.96 Km². 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 2009 and 2010 are shown in Figs 4.9.2 & 4.9.3 respectively.

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

There are 70 Beats in the Division and there is no change in forest cover in any of the 70 Beats during this period.

Fig : 4.9.2

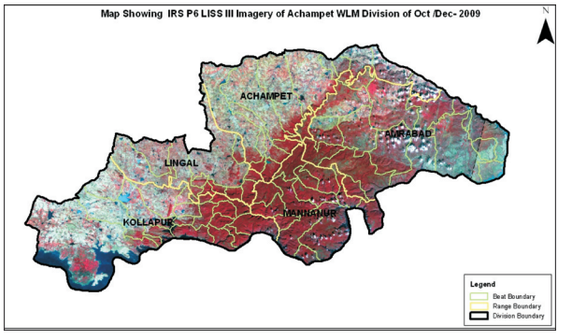


Fig : 4.9.3

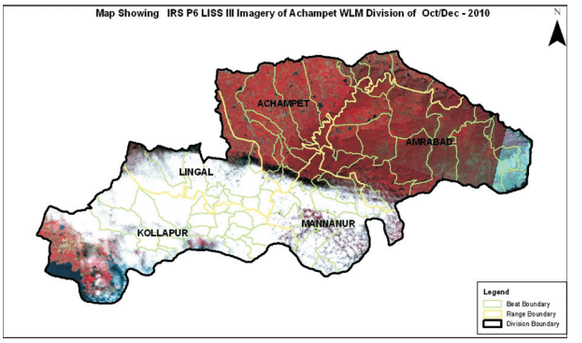


Table 4.9.2: Forest Cover change matrix (Area in Km²)

2009	2010						Total of 2009
	VDF	MDF	OF	Scrub	NF	WB	
Very Dense Forest	0.33	0.00	0.00	0.00	0.00	0.00	**0.33**
Moderately Dense Forest	0.00	479.11	0.00	0.00	0.00	0.00	**479.11**
Open Forest	0.00	0.00	1032.14	0.00	0.00	0.00	**1032.14**
Scrub	0.00	0.00	0.00	782.23	0.00	0.00	**782.23**
Non-Forest	0.00	0.00	0.00	0.00	69.60	0.00	**69.60**
Water	0.00	0.00	0.00	0.00	0.00	59.96	**59.96**
Total of 2010	**0.33**	**479.11**	**1032.14**	**782.23**	**69.60**	**59.96**	**2423.37**
Net Change	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Srisailam Circle

4.10 ATMAKUR WLM DIVISION

4.10.1 Introduction:

Atmakur WLM Forest Division lies in the north-eastern part of Kurnool District between latitudes 15^0 39' 3.6'' and 16^0 8' 52.8'' N and longitudes 78^0 15' 1.8'' and 78^0 55' 57'' E. Geographical Area of the Division is 2154 Km^2 which is 12.20 % of the total area of the District.

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 20^0C to 40^0C and the annual rainfall is about 670 mm, received mainly from Southwest monsoons.

Important minerals and rocks found in the District 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 0.42 Ha. The Population density is 141 persons per Km^2.

Table 4.10.1: Land use Pattern

Land use	Area in SqKm	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
Total	**2154.00**	

4.10.2 Recorded Forest Area:

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

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:

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

4.10.4 Community Forest Management:

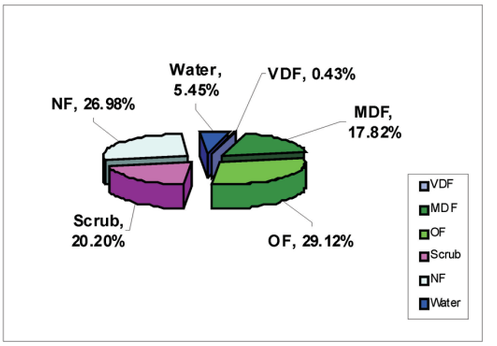
There are 47 Vana Samrakshana Samities (VSSs) in the Division. An area of 135.31 Km^2 forests, which is 10.5 % of the notified forests, is under the management of the VSSs.

4.10.5 Forest Cover:

The forest cover in the Division based on the interpretation of IRS P6 LISS III 2010 data (Jan-2011) is **609.06 Km^2** which is 28.27 % of the Geographical area. In terms of the forest canopy cover density classes the Division has 5.53 Km^2 of Very Dense Forests, 229.08 Km^2 of Moderately Dense Forests and 374.45 Km^2 of Open Forests. The area of the Scrub

is 259.74 Km^2, Non-Forests 346.94 Km^2 and Water Bodies is 70.03 Km^2. 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 image of 2009 and 2010 seasons are shown in Fig 4.10.2 & 4.10.3.

Comparison of the current forest cover with that of previous assessment year shows that **there is no change in forest cover** between this period.

Fig : 4.10.2

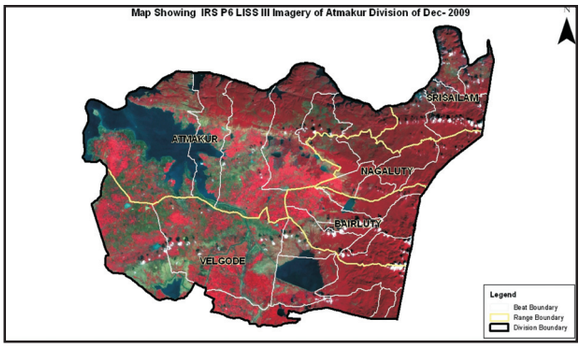
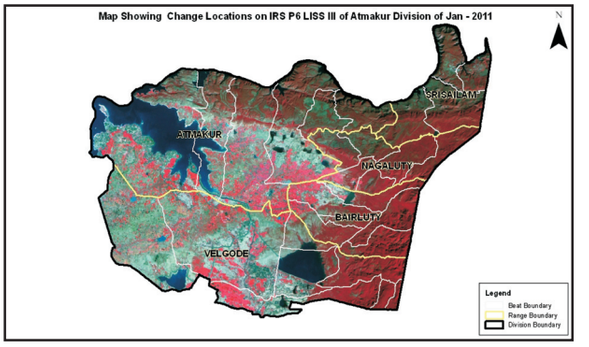


Fig : 4.10.2

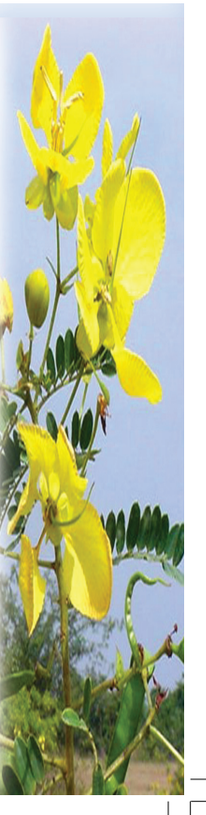


There are 30 Beats in the Division and there are no changes in any of the 30 Beats.

The simplified forest cover change matrix is given in Table 4.10.2.

Table 4.10.2: Forest Cover change matrix (Area in Km^2)

2009	2010						Total of 2009
	VDF	MDF	OF	Scrub	NF	WB	
Very Dense Forest	5.53	0.00	0.00	0.00	0.00	0.00	**5.53**
Moderately Dense Forest	0.00	229.08	0.00	0.00	0.00	0.00	**229.08**
Open Forest	0.00	0.00	374.45	0.00	0.00	0.00	**374.45**
Scrub	0.00	0.00	0.00	259.74	0.00	0.00	**259.74**
Non-Forest	0.00	0.00	0.00	0.00	346.94	0.00	**346.94**
Water	0.00	0.00	0.00	0.00	0.00	70.03	**70.03**
Total of 2010	**5.53**	**229.08**	**374.45**	**259.74**	**346.94**	**70.03**	**1285.77**
Net Change	0.00	0.00	0.00	0.00	0.00	0.00	



Srisailam Circle

4.11 MARKAPUR WLM DIVISION

4.11.1 Introduction:

Markapur WLM Forest Division lies in the south-eastern part of Prakasham district between latitudes 15^0 23' 1'' and 16^0 18' 16'' N and longitudes 78^0 47' 48'' and 79^0 57' 56'' E. Geographical area of the Division is 7,218 Km^2 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 4.11.1

The climate of this Division is dry and salubrious, temperatures ranging from 19^0C to 40^0C; 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^2.

Table 4.11.1: Land use Pattern

Land use	Area in SqKm	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
Total	**7218.00**	

4.11.2 Recorded Forest Area:

The notified forest area of the Division is **2476.39 Km^2** 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.

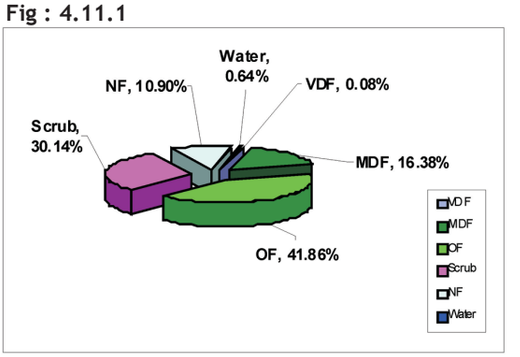
4.11.3 Protected Area:

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^2 is included in the Nagarjuna Sagar Srisailam Tiger Reserve and 55.45 Km^2 in the Gundla Brahmeswaram Wild Life Sanctuary (GBM).

4.11.4 Community Forest Management:

There are 93 Vana Samrakshana Samities (VSSs) in the Division. An area of 347.14 Km^2 forests, which is 14.01 % of the notified forests, is under the management of VSSs.

Fig : 4.11.1



4.11.5 Forest Cover:

The forest cover in the Division based on the interpretation of IRS P6 LISS III 2010 data (Oct 2010) is **1325.59 Km^2** which is 18.36% of the geographical area. In terms of the forest cover canopy density classes the Division has 1.93 Km^2 of Very Dense Forests, 372.31 Km^2

of Moderately Dense Forests and 951.35 Km^2 of Open Forests. The area of the Scrub is 685.04 Km^2, Non-Forest 247.73 Km^2 and Water Bodies 14.50 Km^2. The distribution of the forest cover of the Division is shown in Fig 4.11.1

4.11.6 Change in Forest Cover:

The satellite images of 2009 and 2010 are shown in Fig 4.11.2 & 4.11.3 respectively and the changes between this period are shown on the image of 2010.

Comparison of the current forest cover with that of previous assessment year shows a **negative change of 9.97 Ha**. The forest cover change matrix given in Table 4.11.2 reveals that there is a decrease of 9.97 Ha of open forest and 221.93 Ha of scrub.

The negative change (including scrub) of 89.72 Ha is on account clearance of jungle growth for raising of plantations and 142.18 Ha on account clearance of growth of encroachment. As 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 142.18 Ha** only.

There are 40 Beats in the Division. Negative changes in forest cover are noticed in 8 Beats. There are no changes in the remaining 32 Beats.

Details of forest cover changes in these 8 Beats mentioned above are shown in Table 4.11.3.

Fig : 4.11.2

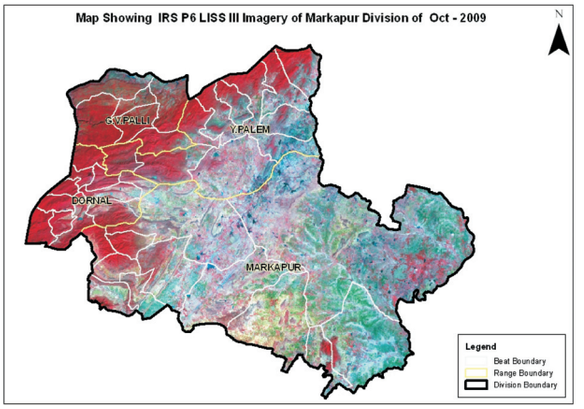


Fig : 4.11.3

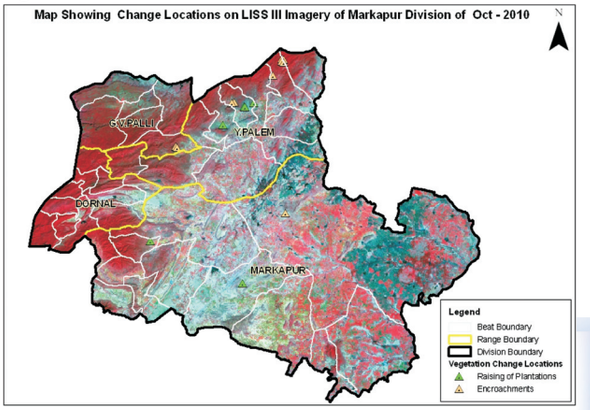


Table 4.11.2: Forest Cover change matrix (Area in Km^2)

2009	2010						Total of 2009
	VDF	MDF	OF	Scrub	NF	Water	
Very Dense Forest	1.93	0.00	0.00	0.00	0.00	0.00	**1.93**
Moderately Dense Forest	0.00	372.31	0.00	0.00	0.00	0.00	**372.31**
Open Forest	0.00	0.00	951.35	0.00	0.10	0.00	**951.45**
Scrub	0.00	0.00	0.00	685.04	2.22	0.00	**687.26**
Non-Forest	0.00	0.00	0.00	0.00	245.41	0.00	**245.41**
Water	0.00	0.00	0.00	0.00	0.00	14.50	**14.5**
Total of 2010	**1.93**	**372.31**	**951.35**	**685.04**	**247.73**	**14.50**	**2272.86**
Net Change	0.00	0.00	-0.10	-2.22	2.32	0.00	

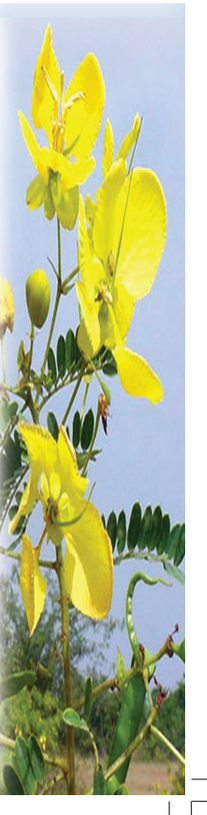


Table 4.11.3 : List of Beats with negative change in Forest Cover (Area in Ha)

Beat	VDF	MDF	OF	Scrub	NF	WB	Total	Net Change	Encroachments
G.V.PALLI RANGE									
G.V.Palli	11.26	1710.29	5101.89	707.54	67.83	9.41	7608.22	-4.32	4.32
Total	**11.26**	**1710.29**	**5101.89**	**707.54**	**67.83**	**9.41**	**7608.22**	**-4.32**	**4.32**
MARKAPUR RANGE									
Gundamcherla	3.21	1227.8	3233.67	1488.64	143.61	0.00	6096.93	-11.28	0.00
Kaluzuvvalapadu	0.00	6.77	103.14	2324.67	1373.04	11.29	3818.91	-27.51	0.00
Potlapadu	4.85	198.41	723.63	1873.96	4105.13	24.5	6930.48	-116.01	116.01
Total	**8.06**	**1432.98**	**4060.44**	**5687.27**	**5621.78**	**35.79**	**16846.32**	**-154.8**	**116.01**
Y.PALEM RANGE									
Akkapalem	0.00	691.01	3029	3171.18	292.29	1.56	7185.04	-1.5	1.5
Komarolu	0.00	430.23	2201.63	2445.2	1781.35	6.02	6864.43	-11.72	
Mallapalem	0.00	7.38	679.36	2779.29	1420.01	2.73	4888.77	-53.25	14.04
Pullalacheruvu	0.00	309.48	2839.57	2519.78	81.15	0.00	5749.98	-6.31	6.31
Total	**0.00**	**1438.1**	**8749.56**	**10915.5**	**3574.8**	**10.31**	**24688.22**	**-72.78**	**21.85**
Grand Total	**19.32**	**4581.37**	**17911.9**	**17310.3**	**9264.41**	**55.51**	**49142.76**	**-231.9**	**142.18**

The development of civilization and industry in general has always shown itself so active in the destruction of forests that everything that has been done for their conservation and production is completely insignificant in comparison. - Karl Marx

4.12 NAGARJUNA SAGAR WLM DIVISION

4.12.1 Introduction:

Nagarjuna Sagar WLM Forest Division spreads over parts of 2 districts, i.e., Nalgonda and Guntur. It is located between latitudes 16^0 09' 45'' and 16^0 55' 04'' N and longitudes 78^0 51' 04'' and 78^0 31' 12'' E. Geographical area of the Division is 2323.46 Km^2. The Division has an average altitude of 615 M above MSL. The River Krishna is Main River of the Division.

Land use pattern of the Division is given in Table 4.12.1

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

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

Population of the Division is 0.62 million (2001 Census), per capita forest area is 0.15 Ha and the population density is 266 persons per Km^2.

Table 4.12.1: Land use Pattern

Land use	Area in SqKm	Percentage
Forest including Scrub	638.04	27.46
Agriculture	850.64	36.61
Land with Scrub	295.83	12.73
Fallow Lands	168.83	7.27
Grass Lands	21.96	0.95
Settlements	6.50	0.28
Vegetation outside Forest	171.76	7.39
Water Bodies	169.90	7.31
Total	**2323.46**	

4.12.2 Recorded Forest Area:

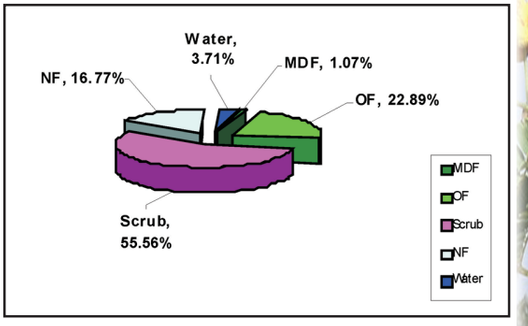
The notified forest area of the Division is **818.57 Km^2** which is 35.2% of the geographical area. Reserved, Protected and Un-classed forests constitute 818.57 Km^2 (99.44%), 0.2 Km^2 (0.03%) and 4.12 Km^2 (0.53%) of the forest area respectively.

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

4.12.3 Protected Area:

Nagarjuna Sagar WL Division is one of the 4 constituent Divisions of Nagarjuna Sagar – Srisailam Tiger Reserve (NSTR), the biggest Tiger Reserve of India. An area of 440.89 Km^2 is included in the Tiger Reserve.

Fig : 4.12.1



4.12.4 Community Forest Management:

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

4.12.5 Forest Cover:

The forest cover in the Division based on the interpretation of IRS P6 LISS III 2010 data (Oct 2010) is **632.19 Km^2** which is

27.21% of the geographical area. In terms of the forest canopy density classes the Division has 8.49 Km^2 of Moderately Dense Forest and 181.98 Km^2 of Open Forest. The area of the Scrub is 441.72 Km^2, Non-Forest 133.29 Km^2 and Water Bodies 29.50 Km^2.The distribution of the forest cover of the Division is shown in Fig 4.12.1

4.12.6 Change in Forest Cover:

The Satellite images of 2009 and 2010 are shown in Figs 4.12.2 and Fig 4.12.3 respectively.

Comparison of the current forest cover with that of previous assessment year shows **no change in forest cover**. The forest cover change matrix is given in Table 4.12.2.

There is no loss of forest cover in this Division during the period.

Fig : 4.12.2

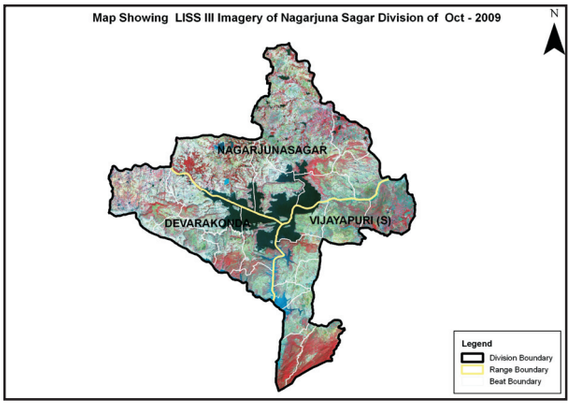


Fig : 4.12.3

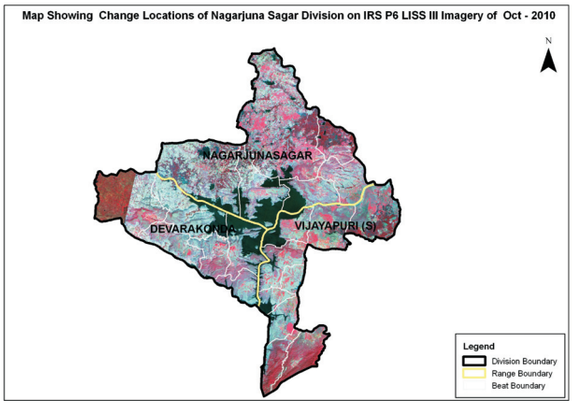


Table 4.12.2 : List of Beats with negative change in Forest Cover (Area in Ha)

2009	2010						Total of 2009
	VDF	MDF	OF	Scrub	NF	WB	
Very Dense Forest	0.00	0.00	0.00	0.00	0.00	0.00	**0.00**
Moderately Dense Forest	0.00	8.49	0.00	0.00	0.00	0.00	**8.49**
Open Forest	0.00	0.00	181.98	0.00	0.00	0.00	**181.98**
Scrub	0.00	0.00	0.00	441.72	0.00	0.00	**441.72**
Non-Forest	0.00	0.00	0.00	0.00	133.29	0.00	**133.29**
Water	0.00	0.00	0.00	0.00	0.00	29.50	**29.50**
Total of 2010	**0.00**	**8.49**	**181.98**	**441.72**	**133.29**	**29.50**	**794.98**
Net Change	0.00	0.00	0.00	0.00	0.00	0.00	

The creation of a thousand forests is in one acorn. - Ralph Waldo Emerson

4.13 GIDDALUR DIVISION

4.13.1 Introduction:

Giddalur Forest Division lies in the south-eastern part of Prakasham District between latitudes 14^0 57' 46'' and 16^0 09' 48'' N and longitudes 78^0 44' 16'' and 80^0 28' 35'' E. Geographical Area of the Division is 10,408.00 Km^2 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.

Landuse pattern of the Division is given in Table 4.13.1.

The climate of this Division is dry and salubrious; the temperatures ranging from 19^0C to 40^0C and the annual rainfall is about 871 mm received mainly from Southwest monsoons.

The rocks in the Division are Sandstone mixed with quartzite and 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 2.53 million (2011 Census); Per capita forest area 0.09 Ha and the population density 209 persons per Km^2.

Table 4.13.1: Land use Pattern

Land use	Area in SqKm	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
Total	**10408.00**	

4.13.2 Recorded Forest Area:

The notified forest area of the Division is **1948.60 Km^2** which is 18.72% of the geographical area. Reserved, Protected and Un-classed Forests constitute 1908.69 Km^2 (97.95%) and 39.91 Km^2 (2.09%) of the forest area respectively.

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

4.13.3 Protected Area:

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

4.13.4 Community Forest Management:

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

4.13.5 Forest Cover:

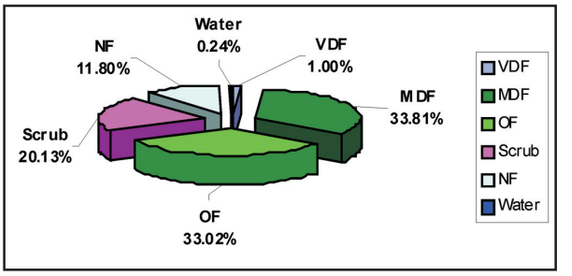
The forest cover in the Division based on the interpretation of IRS P6 LISS III 2010 data (Oct 2010) is **1497.74 Km^2** which is 14.39 % of the Geographical area. In terms of the forest canopy cover density classes the Division has 22.10 Km^2 of Very Dense Forests, 746.57 Km^2 of Moderately Dense Forests and 729.07 Km^2 of Open Forests. The area of the Scrub is 444.58 Km^2, Non-Forests 260.57 Km^2 and Water Bodies 5.31 Km^2. The distribution of the forest cover of the Division is shown in Fig 4.13.1.

4.13.6 Change in Forest Cover:

The satellite images of 2009 and 2010 are shown in Figs 4.13.2 & 4.13.3 respectively and in Forest cover changes during this period are shown on the image of 2010.

Comparison of the current forest cover with that of previous assessment year does not show any change in the canopy cover. The forest cover change matrix is given in Table 4.13.2. It reveals that there is a decrease of 52.46 Ha in scrub.

Fig 4.13.1



A negative change of 34.72 Ha is on account of clearing of jungle growth for raising of plantations and 17.74 Ha is on account of encroachments. Raising of plantations is a forest management intervention and hence not considered as loss of forest cover. Thus negative change on account of encroachments is taken as loss of forest cover. Therefore the **net loss of forest cover is 17.74 Ha** only.

Fig 4.13.2

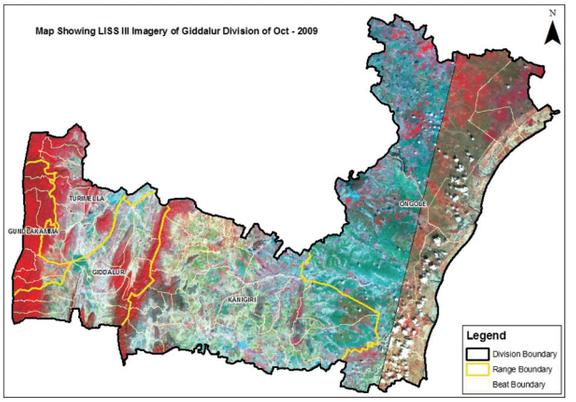
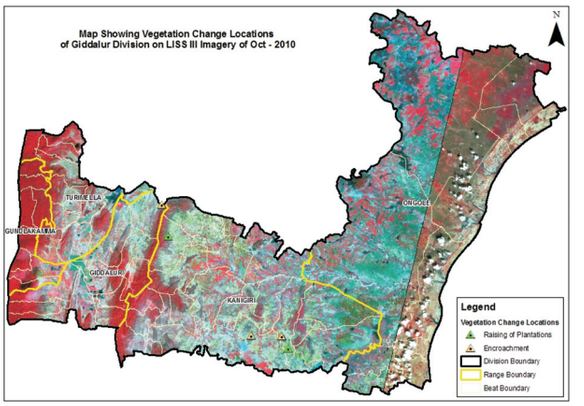


Fig 4.13.3



There area 62 Beats in the Division. Negative changes are noticed in 4 Beats only. There are no changes in the forest cover in the remaining 58 Beats.

Details of forest cover changes in the 4 Beats mentioned above is shown in Table 4.13.3.

Table 4.13.2: Forest Cover change matrix (Area in Km²)

2009	2010						Total of 2009
	VDF	MDF	OF	Scrub	NF	WB	
Very Dense Forest	22.10	0.00	0.00	0.00	0.00	0.00	**22.10**
Moderately Dense Forest	0.00	746.57	0.00	0.00	0.00	0.00	**746.57**
Open Forest	0.00	0.00	729.07	0.00	0.00	0.00	**729.07**
Scrub	0.00	0.00	0.00	444.58	0.52	0.00	**445.10**
Non-Forest	0.00	0.00	0.00	0.00	260.05	0.00	**260.05**
Water	0.00	0.00	0.00	0.00	0.00	5.31	**5.31**
Total of 2010	**22.10**	**746.57**	**729.07**	**444.58**	**260.57**	**5.31**	**2208.20**
Net Change	0.00	0.00	0.00	-0.52	0.52	0.00	

Table 4.13.3: List of Beats with negative change in Forest Cover (Area in Ha)

Beat	VDF	MDF	OF	Scrub	NF	WB	Total	Net Change	Encroachments
GIDDALUR RANGE									
Chinaobenenipalli	0.00	209.66	1867.77	1643.49	298.72	0.00	4019.64	-5.89	5.89
Total	**0.00**	**209.7**	**1867.77**	**1643.49**	**298.72**	**0.00**	**4019.64**	**-5.89**	**5.89**
KANIGIRI RANGE									
Gudipatipalli	20.96	1469.2	3143.67	2026.89	254.69	0.00	6915.38	-24.06	0.00
Kodigampalli	0.00	3.92	30.24	715.12	2819.12	110.74	3679.14	-5.02	5.02
Peddirlapadu	0.00	0.81	580.79	1942.32	862.95	0.00	3386.87	-17.49	6.83
Total	**20.96**	**1474**	**3754.7**	**4684.33**	**3936.76**	**110.74**	**13981.4**	**-46.57**	**11.85**
Grand Total	**20.96**	**1684**	**5622.47**	**6327.82**	**4235.48**	**110.74**	**18001**	**-52.46**	**17.74**

Guntur Circle

4.14 GUNTUR DIVISION

4.14.1 Introduction:

Guntur Forest Division comprises of the entire District and lies in the south-eastern part of Prakasham District between latitudes 15^0 42' 13.68'' and 16^0 49' 23.52'' N and longitudes 79^0 12' 34.56'' and 80^0 54' 16.92'' E. Geographical area of the Division (and District) is 11,391.00 Km^2. 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 the Division are the Krishna and Gundlakamma with tributaries Chandravanka, Goli and Naguleru in Macherla.

Landuse pattern of the Division is given in Table 4.14.1

The climate of this Division is dry and salubrious; temperature ranging from 17^0C to 40^0C 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^2. The livestock population is 2.3 million.

Table 4.14.1: Land use Pattern

Land use	Area in SqKm	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
Total	**10623.19**	

4.14.2 Recorded Forest Area:

The notified forest area of the Division is **1411.10 Km^2**, 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 Forests and Dry evergreen Forests are present. Whereas Inland Forests contain Southern Dry Mixed Deciduous, ***Hardwickia binata*** and ***Acacia arabica*** forests.

4.14.3 Protected Area:

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

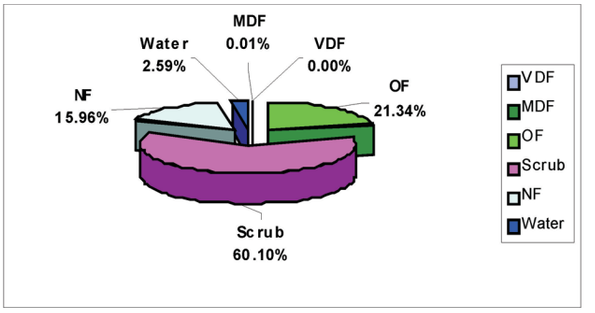
4.14.4 Community Forest Management:

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

4.14.5 Forest Cover:

The forest cover in the Division based on the interpretation of IRS P6 LISS III 2010 data (Dec 10–Jan 11) is **315.27 Km²** which is 21.34% of the Geographical area. In terms of the forest canopy cover density classes the Division has 0.08 Km² of Moderately Dense Forests and 315.19 Km² of Open Forests. The area of the Scrub is 887.62 Km², Non-Forest 235.76 Km² and Water Bodies 38.26 Km². The distribution of the forest cover of the Division is shown in Fig 4.14.1.

Fig 4.14.1



4.14.6 Change in Forest Cover:

The satellite images of 2009 and 2010 are shown in Figs 4.14.2 & 4.14.3 respectively. The changes between this period are shown on the image of 2010.

Comparison of the current forest cover with that of previous assessment year shows a **positive change of 12.69 Ha** and **negative change of 195.46 Ha**. The forest cover change matrix given in Table 4.14.2 reveals that there is a decrease of 10.99 Ha of open forest.

The positive change in forest cover (including scrub) of 12.69 Ha is on account of raising of plantations. The negative change of 160.17 Ha is on account of clearance of jungle growth for raising of plantations and 35.29 Ha on account of encroachments. As raising of plantations is a forest management intervention and hence not considered as loss of forest cover. Thus only the negative change due to encroachments is taken as loss of forest cover. Therefore the **net loss of forest cover is 35.29 Ha** only.

Fig 4.14.2

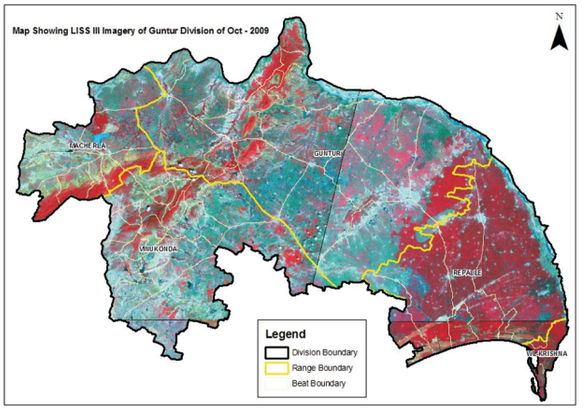
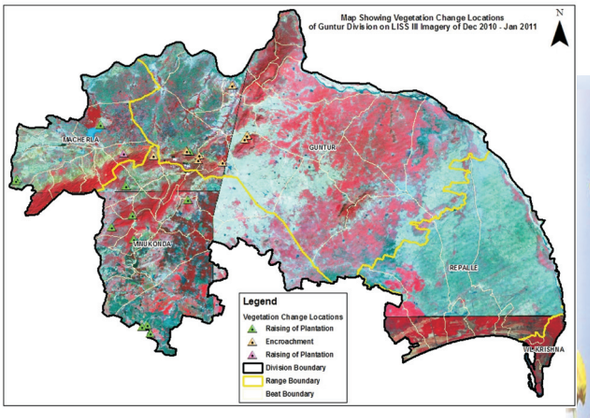


Fig 4.14.3



There are 57 Beats in the Division. Negative changes in forest cover are noticed in 14 Beats and positive change in only 1 Beat. There are no changes in the remaining 42 Beats.

Details of forest cover changes in the 15 Beats mentioned above, are shown in Table 4.14.3.

Table 4.14.2: Forest Cover change matrix (Area in Km²)

2009	2010						Total of 2009
	VDF	MDF	OF	Scrub	NF	WB	
Very Dense Forest	0.00	0.00	0.00	0.00	0.00	0.00	**0.00**
Moderately Dense Forest	0.00	0.08	0.00	0.00	0.00	0.00	**0.08**
Open Forest	0.00	0.00	315.19	0.00	0.11	0.00	**315.30**
Scrub	0.00	0.00	0.00	887.49	1.84	0.00	**889.33**
Non-Forest	0.00	0.00	0.00	0.13	233.81	0.00	**233.94**
Water	0.00	0.00	0.00	0.00	0.00	38.26	**38.26**
Total of 2010	**0.00**	**0.08**	**315.19**	**887.62**	**235.76**	**38.26**	**1476.91**
Net Change	0.00	0.00	-0.11	-1.71	1.82	0.00	

Table 4.14.3: List of Beats with change in Forest Cover (Area in Ha)

Beat	VDF	MDF	OF	Scrub	NF	WB	Total	Net Change	Encroachments
GUNTUR RANGE									
Bodanam	0.00	0.00	117.00	1114.24	489.5	0.00	1720.74	-4.42	4.42
Guthikonda	0.00	0.00	1586.14	2360.82	75.05	1.80	4023.81	-34.10	10.91
Nekarikal	0.00	0.00	560.17	1820.70	313.82	1.95	2696.64	-2.52	2.52
Tripurapuram	0.00	0.00	1154.13	2790.65	69.30	1.48	4015.56	-10.99	10.99
Total	**0.00**	**0.00**	**3417.44**	**8086.41**	**947.67**	**5.23**	**12456.8**	**-52.03**	**28.84**
MACHERLA RANGE									
Adigoppula	0.00	0.00	1405.90	1673.29	110.95	0.00	3190.14	12.69	0.00
Madugula	0.00	0.00	0.00	211.96	451.86	3.09	666.91	-12.28	0.00
Veldurthi	0.00	0.00	30.57	615.86	2533.55	12.30	3192.28	-19.86	0.00
Total	**0.00**	**0.00**	**1436.47**	**2501.11**	**3096.36**	**15.39**	**7049.33**	**-19.45**	**0.00**
VINUKONDA RANGE									
Domalagudem	0.00	0.00	293.58	2619.25	113.47	0.00	3026.3	-13.44	0.00
Epuru East	0.00	0.00	3.90	1293.8	560.56	0.00	1858.26	-9.06	0.00
Kandrika	0.00	0.00	618.23	3402.69	160.16	0.00	4181.08	-7.88	0.00
Karempudi	0.00	0.00	815.55	1948.89	193.43	0.00	2957.87	-6.45	6.45
Naidupalem	0.00	0.00	177.82	2652.68	318.93	1.50	3150.93	-11.11	0.00
Ravulapuram	0.00	0.00	449.49	2375.19	50.78	0.00	2875.46	-3.68	0.00
Ravvaram	0.00	3.57	17.48	1554.04	135.75	1.80	1712.64	-38.65	0.00
Vaddemgunta	0.00	0.00	0.39	2027.43	726.91	0.00	2754.73	-21.02	0.00
Total	**0.00**	**3.57**	**2376.44**	**17874**	**2259.99**	**3.3**	**22517.3**	**-111.29**	**6.45**
Grand Total	**0.00**	**3.57**	**7230.35**	**28461.5**	**6304.02**	**23.92**	**42023.4**	**-182.77**	**35.29**

Forests, lakes and rivers, clouds and winds, stars and flowers, stupendous glaciers and crystal snowflakes - every form of animate or inanimate existence, leaves its impress upon the soul of man.

- Orison Swett Marden

4.15 NELLORE DIVISION

4.15.1 Introduction:

Nellore Forest Division comprises of the entire District of Nellore and lies in the south-eastern part of Andhra Pradesh between latitudes 13^0 48' 49.58'' and 15^0 4' 58.59'' N and longitudes 79^0 6' 4.36'' and 80^0 14' 46.71'' E. Geographical area of the Division is 13,076 Km^2.

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

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, foothills and 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 4.15.1: Land use Pattern

Land use	Area in SqKm	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
Total	**12934.72**	

The climate of this Division is hot and exhausting for most part of the year. Temperature ranges from 15^0 to 41^0 C. Annual rainfall ranges from 700-1040 mm received from south-west and north-east monsoons.

The Division is under laid by two types of the oldest rocks, Schistose and Quartzite's 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 devoid of Pegmatite intrusions but the south eastern portion, Gudur, Rapur areas is 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^2. The livestock population is 2.5 million.

4.15.2 Recorded Forest Area:

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

4.15.3 Protected Area:

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

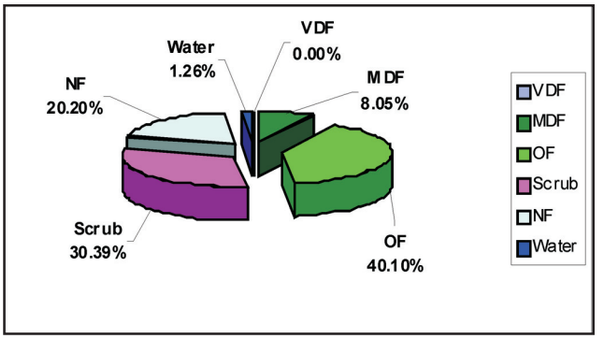
4.15.4 Community Forest Management:

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

4.15.5 Forest Cover:

The forest cover in the Division based on the interpretation of IRS P6 LISS III 2010 data (Sep 2010 – Jan 2011) is **1146.01 Km^2** which is 8.85% of the geographical area. In terms of the forest cover canopy density classes the Division has 191.55 Km^2 of Moderately Dense Forests and 954.46 Km^2 of Open Forests. The area of the Scrub is 723.16 Km^2, Non-Forest 480.84 Km^2 and Water Bodies 29.95 Km^2. 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 images of 2009 and 2010 are shown in Figs 4.15.2 & 4.15.3 respectively and the changes between this period, on the image of 2010.

Comparison of the current forest cover with that of previous assessment year shows a **negative change of 130.68 Ha**. The forest cover change matrix given in Table 4.15.2 reveals that there is a decrease of 130.68 Ha of Open forest and 252.62 Ha of scrub.

Further analysis shows that the negative change (including scrub loss) of 370.98 Ha is on account of raising of plantations and 3.83 Ha is on account of encroachments and 8.49 Ha is on account of forest fires. 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 encroachment alone is taken as loss of forest cover. Therefore the **net loss of forest cover is 3.83 Ha** only.

Fig 4.15.2

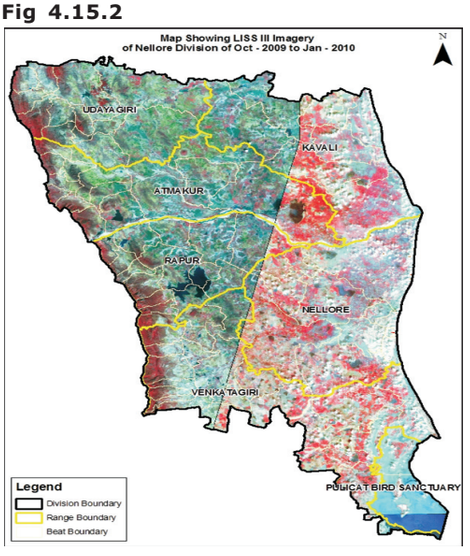
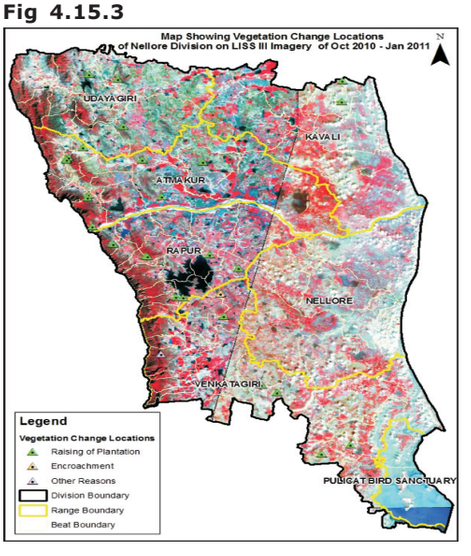


Fig 4.15.3



There are 85 Beats in the Division. Negative changes in forest cover are noticed in 21 Beats. There are no changes in the remaining 64 Beats.

Details of forest cover changes in the 21 Beats mentioned above are shown in Table 4.15.3.

Table 4.15.2: Forest Cover change matrix (Area in Km^2)

2009	2010						Total of 2009
	VDF	MDF	OF	Scrub	NF	WB	
Very Dense Forest	0.00	0.00	0.00	0.00	0.00	0.00	**0.00**
Moderately Dense Forest	0.00	191.55	0.00	0.00	0.00	0.00	**191.55**
Open Forest	0.00	0.00	954.46	0.00	1.31	0.00	**955.77**
Scrub	0.00	0.00	0.00	723.16	2.53	0.00	**725.69**
Non-Forest	0.00	0.00	0.00	0.00	477.00	0.00	**477.00**
Water	0.00	0.00	0.00	0.00	0.00	29.95	**29.95**
Total of 2010	**0.00**	**191.55**	**954.46**	**723.16**	**480.84**	**29.95**	**2379.96**
Net Change	0.00	0.00	-1.31	-2.53	3.84	0.00	

Table 4.15.5: List of Beats with negative change in Forest Cover (Area in Ha)

Beat	VDF	MDF	OF	Scrub	NF	WB	Total	Net Change	Encroachments
ATMAKUR RANGE									
Brahmanapalli	0.00	434.67	1167.48	451.32	139.8	9.5	2202.77	-21.18	0.00
Gudigunta	0.00	971.6	3432.03	1367.4	52.82	33.57	5857.42	-15.12	0.00
Kampasamudram	0.00	0.00	17.78	519.95	226.51	6.89	771.13	-5.9	0.00
Ponguru	0.00	0.34	783.29	2959.65	423.06	13.11	4179.45	-32.88	0.00
Rajavolu	0.00	0.58	102.9	1239.22	554.04	1.29	1898.03	-3.87	0.00
T. Talupur	0.00	104.34	2087.69	1188.51	109.39	7.97	3497.9	-4.18	0.00
Total	**0.00**	**1511.53**	**7591.2**	**7726.05**	**1505.62**	**72.33**	**18406.7**	**-83.13**	**0.00**
KAVALI RANGE									
Kavali	0.00	10.46	141.02	324.88	2143.18	6.66	2626.2	-90.91	0.00
Total	**0.00**	**10.46**	**141.02**	**324.88**	**2143.18**	**6.66**	**2626.2**	**-90.91**	**0.00**
RAPUR RANGE									
Chipini	0.00	412.21	1636.38	764.01	179.6	9.99	3002.19	-37.49	0.00
Pulikollu	0.00	0.00	65.05	590.24	134.78	569.16	1359.23	-18.29	0.00
Rajupalem-Rapur	0.00	133.07	1834.77	1323.87	219.16	25.79	3536.66	-7.5	0.00
Thumaya	0.00	1.4	414.91	1103.63	261.39	831.53	2612.86	-31.53	0.00
Vavintaparthi	0.00	1.79	510.15	1150.42	552.43	143.4	2358.19	-2.55	0.00
Total	**0.00**	**548.47**	**4461.3**	**4932.17**	**1347.36**	**1579.9**	**12869.13**	**-97.36**	**0.00**
UDAYAGIRI RANGE									
Arlapadia	0.00	712.37	3885.39	3345.17	274.37	0.00	8217.3	-9.6	0.00
Duttalur	0.00	5.42	776.02	2666.91	440.61	0.00	3888.96	-3.01	0.00
Varikuntapadu	0.00	2.44	528.21	2042.45	753.75	0.00	3326.85	-9.53	0.00
Total	**0.00**	**720.23**	**5189.6**	**8054.53**	**1468.73**	**0.00**	**15433.11**	**-22.14**	**0.00**
VENKATAGIRI RANGE									
Alturpad	0.00	1096.99	3804.6	1018.1	636.37	1.28	6557.34	-8.49	0.00
Attiwaram	0.00	80.87	184.56	545.23	1373.05	3.6	2187.31	-12.03	0.00
Chaganam	0.00	22.64	1976.52	2463.98	135.97	16.19	4615.3	-3.83	3.83
Gilakapadu	0.00	75.41	1344.86	978.95	308.26	1.8	2709.28	-10.84	0.00
Jayampu	0.00	138.8	522.99	831.35	1120.95	82.81	2696.9	-2.33	0.00
Uggumudi	0.00	32.19	571.64	825.28	1505.92	1.45	2936.48	-52.24	0.00
Total	**0.00**	**1446.9**	**8405.2**	**6662.89**	**5080.52**	**107.13**	**21702.61**	**-89.76**	**3.83**
Grand Total	**0.00**	**4227.13**	**25647**	**27375.6**	**9402.23**	**1759.3**	**68411.55**	**-383.3**	**3.83**

Hyderabad Circle

4.16 HYDERABAD DIVISION

4.16.1 Introduction:

Hyderabad Forest Division consists of Hyderabad & Rangareddy Districts. Hyderabad Forest Division lies between latitudes 16^0 50' 39" to 17^0 42' 28" in the North & Longitudes 77^0 21' 49" to 78^0 49' 49" in the East. The Geographical Area of the Division is 7,710 Km^2. The average altitude is 536 M above MSL. Twin cities of Hyderabad and Secunderabad fall in this Division which is the capital of the state. The highest point in the city is Banjara Hills, which is 665 M above MSL. The contour level falls gradually from west to east creating almost a trough near the Musi River which runs through the city.

Landuse pattern of the Division is given in Table 4.16.1

The climate of this Division is generally dry with temperatures ranging from 14^0C to 45^0C and the normal rain fall of the District is 786.8 mm, received mainly from Southwest monsoons.

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

The population of the Division is 9.30 millions (2011 Census). The per capita forest area is 0.01 Ha and the population density is 1207 persons per Km^2.The livestock population is 1.6 million.

Table 4.16.1: Landuse Pattern

Land use	Area in SqKm	Percentage
Forest including Scrub	730.75	9.48
Agriculture	5916.47	76.77
Land with Scrub	435.56	5.64
Fallow Lands	14.15	0.18
Grasslands	0.79	0.01
Settlements	424.91	5.50
Not available for cultivation	27.36	0.35
Water Bodies	160.01	2.07
Total	**7710.00**	

4.16.2 Recorded Forest Area:

The notified forest area of the Division is **730.75 Km^2** which is 9.48% of the geographical area. Reserved, Protected and Un-classed Forests Constitute 379.96 Km^2 (52%), 244.70 Km^2 (33.49%) and 106.09 Km^2 (14.52%) of the forest area respectively.

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

4.16.3 Protected Area:

There are 3 Protected Areas in the Division. These are Chilkur National Park (4.87 Km^2), KBR National Park (1.70 Km^2) and of Mahaveer Harina Vanasthali Deer Park (14.12 Km^2).

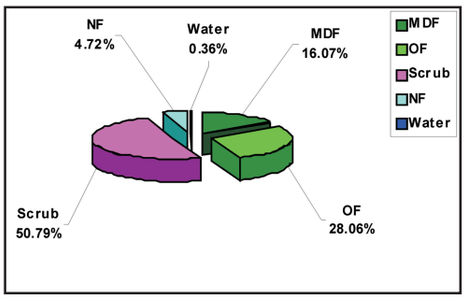
4.16.4 Community Forest Management:

There are 123 Vana Samrakshana Samities (VSSs) in the Division. An area of 353.49 Km^2 forests, which is 48.37 % of the notified forests, is under the management of the VSSs.

4.16.5 Forest Cover:

The forest cover in the Division based on the interpretation of IRS P6 LISS III 2010 data (Dec 2010) is **334.89 Km^2** which is 4.343% of the Geographical area. In terms of the forest canopy density classes the Division has 121.95 Km^2 of Moderately Dense Forest and 212.94 Km^2 of Open Forest. The area of the Scrub is 385.44 Km^2, Non-Forest 35.79 Km^2 and Water Bodies 2.75 Km^2. The distribution of the forest cover of the Division is shown in Fig 4.16.1

Fig 4.16.1



4.16.6 Change in Forest Cover:

The Satellite images of 2009 and 2010 are shown in Figs 4.16.2 & 4.16.3 respectively and the changes between this period are shown on the image of 2010.

Comparison of the current forest cover with that of previous assessment year shows a **negative change of 184.30 Ha**. The forest cover change matrix given in Table 4.16.2 reveals that there is a decrease of 11.26 Ha of moderately dense forest, 173.05 Ha of open forest and 175.53 Ha of scrub.

Of the total negative change (including scrub) of 359.84 Ha; 100.02 Ha is on account of clearing of jungle growth for raising of plantations, 76.95 Ha on account of harvesting of mature plantations, 150.68 Ha on account of diversion of forest lands for non-forestry purposes and 32.19 Ha on account of encroachments. As clearance of jungle growth for raising of plantations, harvesting of plantation and diversion forest lands are forest management interventions the same are not considered as loss of forest cover. Thus only the negative change due to encroachment is taken as loss of forest cover. Therefore the **net loss of forest cover is 32.19 Ha** only.

Fig 4.16.2

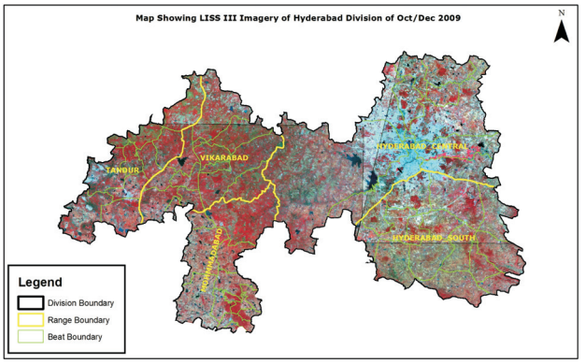
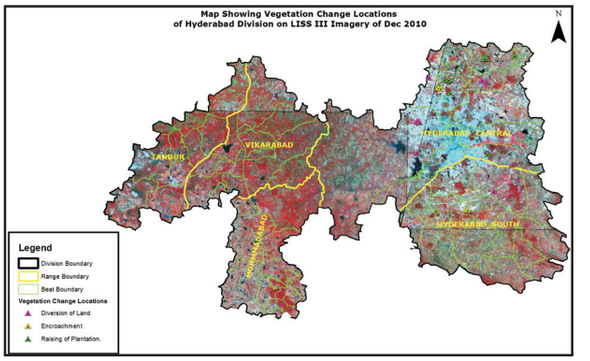


Fig 4.16.3



There are 62 Beats in the Division. Negative changes in forest cover are noticed in only 8 Beats. There are no changes in the remaining 54 Beats.

Details of forest cover changes in these 8 Beats are shown in Table 4.16.3

Table 4.16.2: Forest Cover change matrix (Area in Km²)

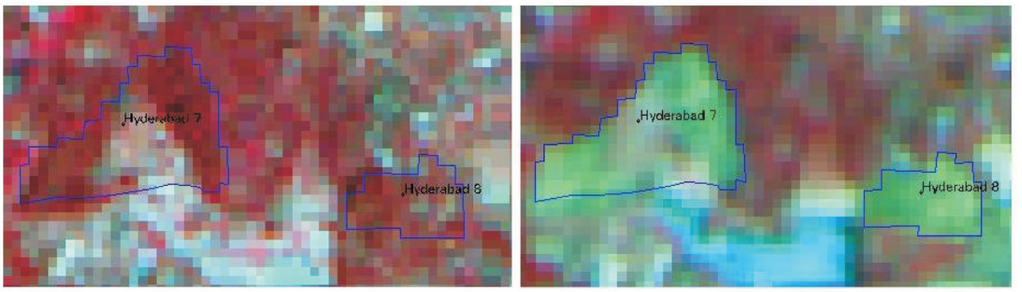
2009	2010						Total of 2009
	VDF	MDF	OF	Scrub	NF	WB	
Very Dense Forest	0.00	0.00	0.00	0.00	0.00	0.00	**0.00**
Moderately Dense Forest	0.00	121.95	0.00	0.00	0.11	0.00	**122.06**
Open Forest	0.00	0.00	212.94	0.00	1.73	0.00	**214.67**
Scrub	0.00	0.00	0.00	385.44	1.76	0.00	**387.20**
Non-Forest	0.00	0.00	0.00	0.00	32.19	0.00	**32.19**
Water	0.00	0.00	0.00	0.00	0.00	2.75	**2.75**
Total of 2010	**0.00**	**121.95**	**212.94**	**385.44**	**35.79**	**2.75**	**758.87**
Net Change	0.00	-0.11	-1.73	-1.76	3.60	0.00	

Table 4.16.3: List of Beats with negative change in Forest Cover (Area in Ha)

Beat	VDF	MDF	OF	Scrub	NF	WB	Net Change	Encroachments
HYDERABAD-NORTH RANGE								
Amberpet	0.00	10.32	72.44	1,770.68	337.68	0.00	-10.07	0.00
Mudmiyal	0.00	9.71	89.05	1,192.90	140.41	0.00	-40.82	0.00
Pochampally	0.00	22.26	233.46	604.76	183.25	0.00	-76.34	0.00
Shamirpet	0.00	5.21	144.8	587.19	114.05	0.00	-77.30	0.00
Suraram	0.00	0.00	9.28	439.46	164.35	0.00	-21.96	17.97
Turkapally	0.00	320.28	406.81	849.06	308.7	0.00	-94.44	0.00
Total	**0.00**	**367.78**	**955.84**	**5444.05**	**1248.44**	**0.00**	**-320.93**	**17.97**
HYDERABAD-SOUTH RANGE								
Ibrahimpatnam	0.00	0.67	10.2	870.86	124.16	0.00	-24.70	0.00
Kongrakalan	0.00	31.08	173.61	1,333.64	68.18	0.00	-14.22	14.22
Total	**0.00**	**31.75**	**183.81**	**2204.5**	**192.34**	**0.00**	**-38.92**	**14.22**
Grand Total	**0.00**	**399.53**	**1139.65**	**7648.55**	**1440.78**	**0.00**	**-359.84**	**32.19**

Satellite Images

2009 **2010**



Longitude	78.42134° E	78.42811° E
Latitude	17.55633° N	17.55463° N
Area in Ha	13.14	4.83
Change	OF to NF	Scrub to NF
Compt No	206	206
Beat	Suraram	Suraram
Range	Hyd North	Hyd North
Division	Hyderbad	Hyderbad

Nature is a temple in which living columns sometimes emit confused words. Man approaches it through forests of symbols, which observe him with familiar glances.

- Charles Baudelaire

4.17 MAHABUBNAGAR DIVISION

4.17.1 Introduction:

Mahabubnagar Forest Division lies in the western part of Mahabubnagar District between latitudes 15^0 50' 12'' and 17^0 14' 13'' N and longitudes 77^0 14' 55'' and 78^0 48' 07'' E. Geographical area of the Division is 13,802.75 Km^2 which is 74.88 % of the area of the District. The Division has an average altitude of 498 M above MSL. The district can be physiographically divided into more or less 2 distinct regions; the plains with low lying scattered hills and the extensive Amarabad-Farhabad plateau- a continuous range of hills of an average elevation of about 800 M above MSL extending more or less east-west along the Krishna river on the southern boundary of the district. The hill range is interspersed by several deep valleys which are almost inaccessible from the plains. Two important rivers, viz. Krishna and Tungabhadra flow through the district.

Land use pattern of the Division is given in Table 4.17.1

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

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

Table 4.17.1: Land use Pattern

Land use	Area in SqKm	Percentage
Forest including Scrub	616.85	4.47
Agriculture	11560.48	83.76
Land with Scrub	436.22	3.36
Fallow Lands	412.62	2.99
Settlements	36.58	0.26
Not available for cultivation	250.11	3.35
Water Bodies	462.38	1.81
Total	**13802.75**	

4.17.2 Recorded Forest Area:

The notified forest area of the Division is **573.18 Km^2** which 4.15% of the geographical area. Reserved, Protected and Un-classed forests constitute 442.44 Km^2 (77.19%), 118.77 Km^2 (20.72%) and 11.97 Km^2 (2.09%) of the forest area respectively.

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

4.17.3 Protected Area:

There is no Protected Area in the Division.

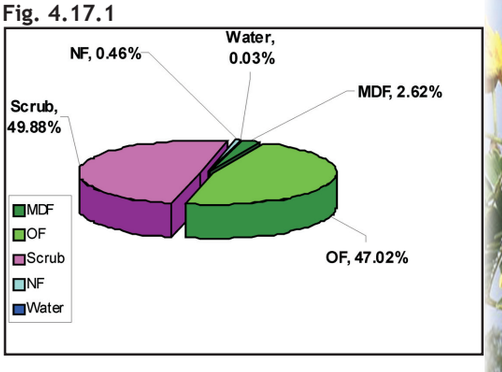
4.17.4 Community Forest Management:

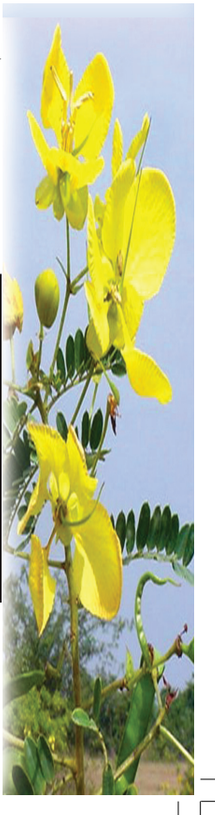
There are 207 Vana Samrakshana Samities (VSSs) in the Division. An area of 455.62 Km^2 forests which is 79.49 % of the notified forests, is under the management of the VSSs.

4.17.5 Forest Cover:

The forest cover in the Division based on the interpretation of IRS P6 LISS III 2010 (Data of Dec 2010 to Jan 2011) is **307.46 Km^2** which is 2.23% of the geographical area. In terms of the forest canopy density classes the Division 16.20 Km^2 of Moderately Dense Forest and 291.26 Km^2 Open Forest. The area of the Scrub is 308.98 Km^2,

Fig. 4.17.1





Non-Forest 2.88 Km^2 and Water Bodies 0.16 Km^2. The distribution of the forest cover of the Division is shown in Fig 4.17.1

4.17.6 Change in Forest Cover:

The satellite images of 2009 and 2010 are shown in Figs 4.17.2 & 4.17.3 respectively and the changes during this period on the image of 2010.

Comparison of the current forest cover with that of previous assessment year shows **no change**. The forest cover change matrix given in Table 4.17.2 reveals that there is a decrease of 18.69 Ha of scrub.

Out of the total negative change (including scrub) of 18.69 Ha**,** loss of 12.37 Ha is on account of clearance of jungle growth for raising of plantations and 6.32 Ha is on account of encroachments. As clearance of jungle growth for raising of plantation is a management intervention the same is not considered as loss of forest cover. Thus only the negative change due to encroachment is taken as loss of forest cover. Therefore the **net loss of forest cover is 6.32 Ha** only.

Fig. 4.17.2

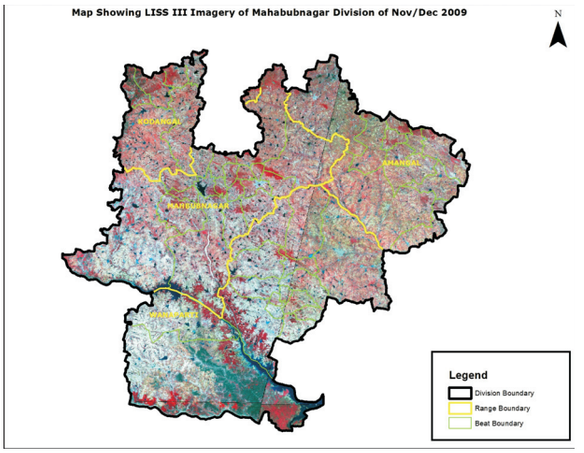
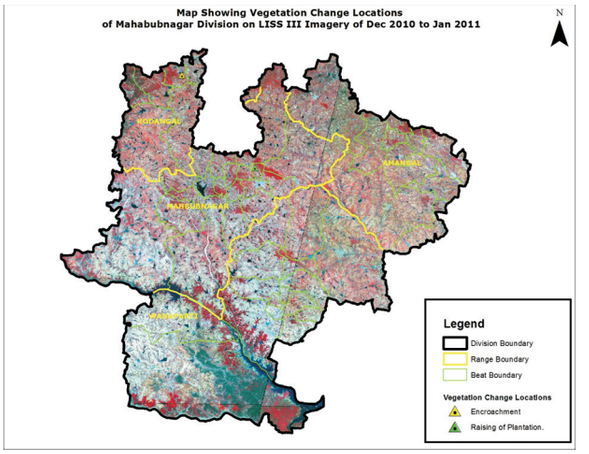


Fig. 4.17.3



There are 51 Beats in the Division. Negative changes in forest cover are seen in 2 Beats and there are no changes in remaining 49 Beats.

Details of forest cover changes in these 2 Beats are shown in Table 4.17.3

Table 4.17.2: Forest Cover change matrix (Area in Km^2)

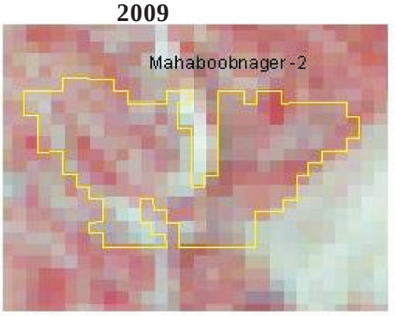
2009	2010						Total of 2009
	VDF	MDF	OF	Scrub	NF	WB	
Very Dense Forest	0.00	0.00	0.00	0.00	0.00	0.00	**0.00**
Moderately Dense Forest	0.00	16.20	0.00	0.00	0.00	0.00	**16.20**
Open Forest	0.00	0.00	291.26	0.00	0.00	0.00	**291.26**
Scrub	0.00	0.00	0.00	308.98	0.19	0.00	**309.17**
Non-Forest	0.00	0.00	0.00	0.00	2.69	0.00	**2.69**
Water	0.00	0.00	0.00	0.00	0.00	0.16	**0.16**
Total of 2010	**0.00**	**16.20**	**291.26**	**308.98**	**2.88**	**0.16**	**619.48**
Net Change	0.00	0.00	0.00	-0.19	0.19	0.00	

Table 4.17.3 : List of Beats with negative change in Forest Cover (Area in Ha)

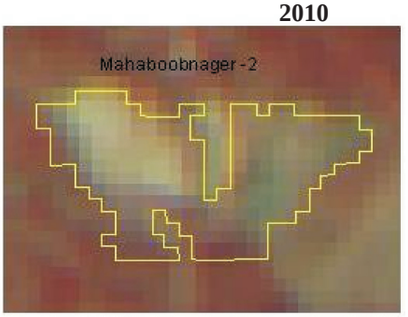
Beat	VDF	MDF	OF	Scrub	NF	WB	Net Change	Encroachments
KODANGAL RANGE								
Kothur	0.00	87.06	1289.29	498.25	8.64	1883.24	-6.32	6.32
MAHABUBNAGR RANGE								
Appannapally	0.00	239.2	1130.01	58.85	12.37	1440.43	-12.37	0.00
Grand Total	**0.00**	**326.26**	**2419.3**	**557.1**	**21.01**	**3323.67**	**-18.69**	**6.32**

Satellite Images

2009



2010



Longitude	77.98214^{0}E
Latitude	16.80411^{0}N
Area in Ha	12.37
Change	Scrub to NF
Compt No	7295
Beat	Kothur
Range	Kodangal
Division	Mahabubnagar

Hyderabad Circle

4.18 NALGONDA DIVISION

4.18.1 Introduction:

Nalgonda Forest Division and District lies in the southern part of Telangana region of the State between latitudes 16^0 21' 19'' and 17^0 48' 42'' N and longitudes 78^0 36' 43'' and 80^0 04' 27'' E. Geographical area of the Division is 12553.70 Km^2. The Division has an average altitude of 421 M above MSL. Major streams falling in Division are Musi, Dindi, Pegga vadu, Kangal, Alair, and Halia, which are tributaries of Krishna river.

Landuse pattern of the Division is given in Table 4.18.1

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

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

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

Table 4.18.1: Land use Pattern

Land use	Area in SqKm	Percentage
Forest including Scrub	281.41	2.24
Agriculture	10714.96	85.35
Land with Scrub	837.29	6.67
Fallow Lands	171.14	1.36
Settlements	104.70	0.83
Not available for cultivation	30.79	0.25
Water Bodies	413.41	3.29
Total	**12553.70**	

4.18.2 Recorded Forest Area:

The notified forest area of the Division is **450.29 Km^2** which is 3.6% of the geographical area.

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

4.18.3 Protected Area:

There is no Protected Area in the Division.

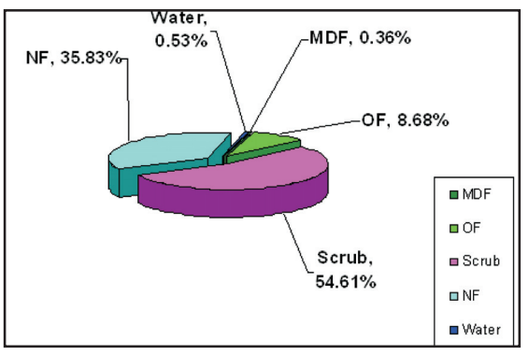
4.18.4 Community Forest Management:

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

4.18.5 Forest Cover:

The forest cover in the Division based on the interpretation of IRS P6 LISS III 2010 data (Oct / Dec 2010) is **39.92 Km^2** which is 0.317% of the geographical area. In terms of the forest canopy density classes the Division has 1.57 Km^2 of Moderately Dense Forest and 38.35 Km^2 of Open Forest. The area of the Scrub is 241.36 Km^2, Non- Forest 158.36 Km^2 and Water Bodies 2.36 Km^2.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 2009 and 2010 are shown in Figs 4.18.2 & 4.18.3 respectively and the changes during this period are shown on the image of 2010.

Comparison of the current forest cover with that of previous assessment year **does not show any change** during the period. The forest cover change matrix given in Table 4.18.2 reveals that there is a decrease of 3.19 Ha of Scrub.

The negative change of 3.19 Ha is on account of encroachments, hence the same taken as loss of forest cover. Therefore the **net loss of forest cover is 3.19 Ha.**

Fig 4.18.2

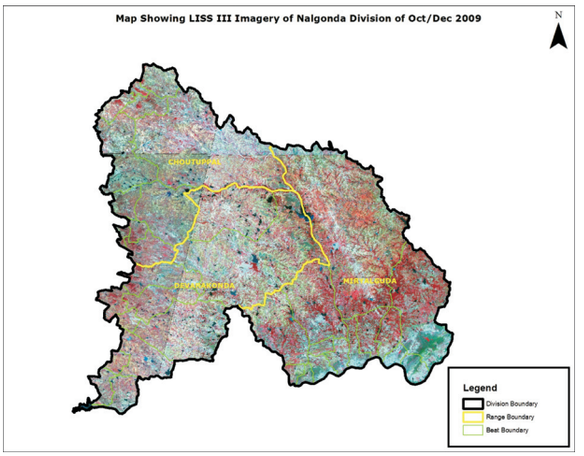
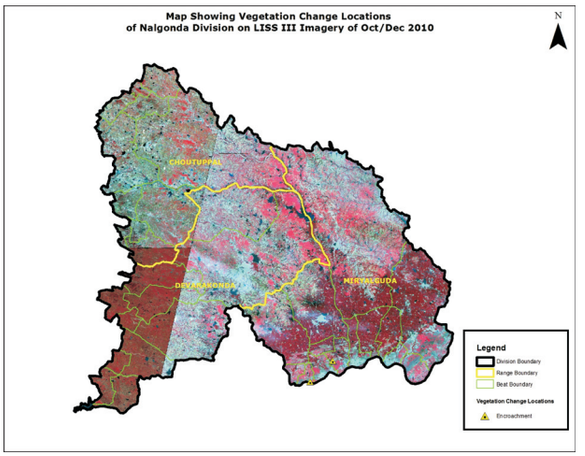


Fig 4.18.3



There are 36 Beats in the Division. Negative changes in forest cover are noticed in only 2 Beats. There are no changes in remaining 34 Beats.

Details of forest cover changes in these 2 Beats is shown in Table 4.18.3

Table 4.18.2: Forest Cover change matrix (Area in Km^2)

2009	2010						Total of 2009
	VDF	MDF	OF	Scrub	NF	WB	
Very Dense Forest	0.00	0.00	0.00	0.00	0.00	0.00	**0.00**
Moderately Dense Forest	0.00	1.57	0.00	0.00	0.00	0.00	**1.57**
Open Forest	0.00	0.00	38.35	0.00	0.00	0.00	**38.35**
Scrub	0.00	0.00	0.00	241.36	0.03	0.00	**241.39**
Non-Forest	0.00	0.00	0.00	0.00	158.33	0.00	**158.33**
Water	0.00	0.00	0.00	0.00	0.00	2.36	**2.36**
Total of 2010	**0.00**	**1.57**	**38.35**	**241.36**	**158.36**	**2.36**	**442.00**
Net Change	0.00	0.00	0.00	-0.03	0.03	0.00	

Table 4.18.3: Beat wise Forest Cover (Area in Ha)

Beat	VDF	MDF	OF	Scrub	NF	WB	Total	Net Change	Encroachments
MIRYALGUDA RANGE									
Adavidevulapally	0.00	34.43	130.19	1007.92	108.47	0.00	1315.64	-1.74	1.74
Damercherla	0.00	1.58	35.29	1069.62	676.07	0.00	1797.98	-1.45	1.45
Grand Total	**0.00**	**36.01**	**165.48**	**2077.54**	**784.54**	**0.00**	**3113.62**	**-3.19**	**3.19**

Man becomes then not the lord and master of all creation but he is its servant.

- Old letters 25 April 1925, 43 CWMG vol 26,546.

4.19 BHADRACHALAM NORTH DIVISION

4.19.1 Introduction:

Bhadrachalam North Forest Division lies in the northern part of Khammam District between latitudes 17^0 35' 47'' and 18^0 37' 46'' N and longitudes 80^0 22' 22'' and 81^0 09' 40'' E. Geographical area of the Division is 2406 Km^2 which is 15.01 % of the area of District. The important rivers which flow through this Division are the Godavari and the Taliperu.

Land use pattern of the Division is given in Table 4.19.1

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

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

Table 4.11.1: Land use Pattern

Land use	Area in SqKm	Percentage
Forest including Scrub	1307.66	54.35
Agriculture	649.69	27.00
Land with Scrub	85.74	3.56
Fallow Lands	184.48	7.67
Grasslands	34.10	1.42
Settlements	7.88	0.33
Vegetation outside Forest	69.52	2.89
Water Bodies	66.93	2.78
Total	**2406.00**	

The population of the Division is 0.231 million (2011 Census), per capita forest area 0.62 Ha and the population density 96 persons per Km^2.

4.19.2 Recorded Forest Area:

The notified forest area of the Division is **1863.82 Km^2** which is 77.46% of the geographical area. Reserved, Protected- and Un-classed forests comprise of 1418.72 Km^2 (76.12%), 333.70 Km^2 (17.9%) and 111.40 Km^2 (5.98%) of the total forest area respectively.

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

4.19.3 Protected Area:

There is no protected area in the Division.

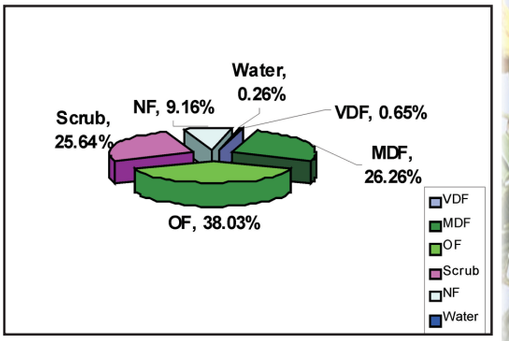
4.19.4 Community Forest Management:

There are 64 Vana Samrakshana Samities (VSSs) or Joint Forest Protection Committees (JFPCs) in the Division. An area of 118.81 Km^2, which is 8.28 % of the 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 P6 LISS III 2010 data (Oct-Dec 2010) is **932.24 Km^2** which is 38.75% of the geographical area. In terms of the forest canopy density classes the Division has 9.26 Km^2 of Very Dense Forests, 377.05 Km^2 of Moderately Dense Forests and 545.93 Km^2 of Open Forests. The area of the Scrub is 368.15 Km^2, Non-Forest 131.44 Km^2 and Water Bodies 3.74 Km^2. The distribution of the forest cover of the Division is shown in Fig 4.19.1

Fig 4.19.1



4.19.6 Change in Forest Cover:

The satellite images of 2009 and 2010 are shown in Fig 4.19.2 & 4.19.3 respectively and the changes between this period on the image of 2010.

Comparison of the current forest cover with that of previous assessment year shows a **negative change of 126.92 Ha**. The forest cover change matrix given in Table 4.19.2 reveals that there is a decrease of 12.44 Ha of moderately dense forest and 114.48 Ha of open forest.

The total negative change of 126.92 Ha is on account of encroachments; hence the same is taken as loss of forest cover. Therefore, the **net loss of forest cover is 126.92 Ha.**

Fig 4.19.2

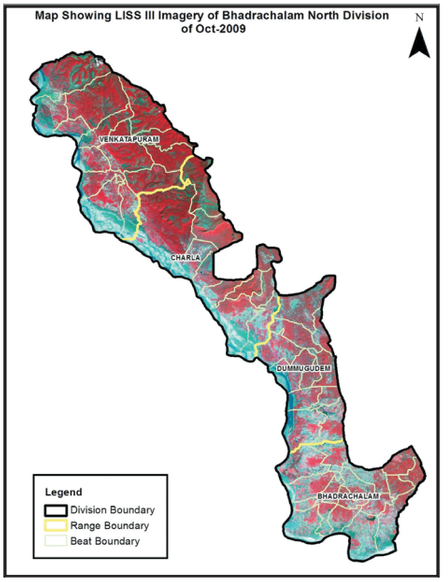
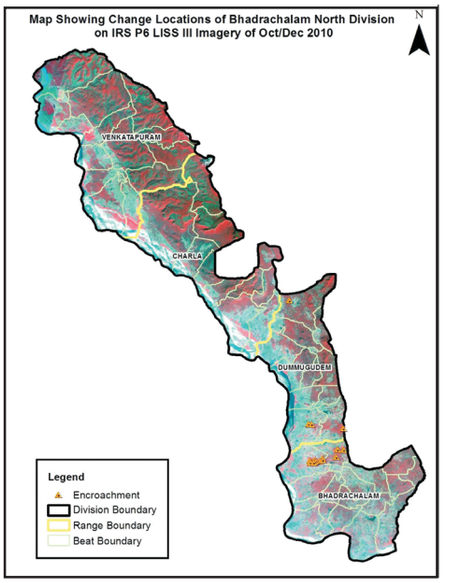


Fig 4.19.3



There are 52 Beats in the Division. Negative changes are noticed in 5 Beats. There is no change in the remaining 47 Beats.

Details of forest cover changes in these 5 Beats is shown in Table 4.19.3

Table 4.19.2: Forest Cover change matrix (Area in Km²)

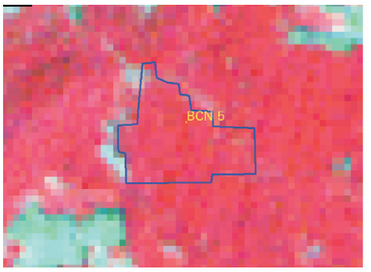
2009	2010						Total of 2009
	VDF	MDF	OF	Scrub	NF	WB	
Very Dense Forest	9.26	0.00	0.00	0.00	0.00	0.00	**9.26**
Moderately Dense Forest	0.00	377.05	0.00	0.12	0.00	0.00	**377.17**
Open Forest	0.00	0.00	545.93	1.14	0.00	0.00	**547.07**
Scrub	0.00	0.00	0.00	366.89	0.00	0.00	**366.89**
Non-Forest	0.00	0.00	0.00	0.00	131.44	0.00	**131.44**
Water	0.00	0.00	0.00	0.00	0.00	3.74	**3.74**
Total of 2010	**9.26**	**377.05**	**545.93**	**368.15**	**131.44**	**3.74**	**1435.57**
Net Change	0.00	-0.12	-1.14	1.26	0.00	0.00	

Table 4.19.3: List of Beats with negative change in Forest Cover (Area in Ha)

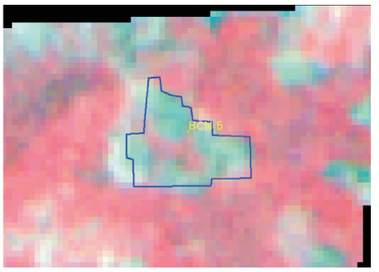
Beat	VDF	MDF	OF	Scrub	NF	WB	Total	Net Change	Encroachments
BHADRACHALAM RANGE									
Arlagudem	0.00	434.19	559.46	230.15	198.06	1.78	1423.64	-25.56	25.56
Singaram	0.00	444.83	273.66	399.76	489.92	0.00	1608.17	-57.66	57.66
Total	**0.00**	**879.02**	**833.12**	**629.91**	**687.98**	**1.78**	**3031.81**	**-83.22**	**83.22**
DUMMUGUDEM RANGE									
Anjubaka	0.00	230.06	69.90	104.46	94.58	0.00	499.00	-37.14	37.14
Kothuru	0.00	726.40	599.01	712.24	229.44	1.12	2268.21	-3.48	3.48
Uyyalamadugu	31.80	2189.52	2201.75	1719.78	148.39	70.10	6361.34	-3.08	3.08
Total	**31.80**	**3145.98**	**2870.66**	**2536.48**	**472.41**	**71.22**	**9128.55**	**-43.70**	**43.70**
Grand Total	**31.80**	**4025.00**	**3703.78**	**3166.39**	**1160.39**	**73.00**	**12160.36**	**-126.92**	**126.92**

Satellite Images

2009



2010



Longitude	80.98500^0 E
Latitude	17.82147^0 N
Area in Ha	14.11
Change	OF to Scrub
Compt No	44
Beat	Arlagudem
Range	Bhadrachalam
Division	Bhadrachalam North

Establish and safeguard viable nature and biosphere reserves, including wet lands and marine areas, to protect Earth's life support system, maintain biodiversity and preserve our heritage. - *Earth Charter & Gandhi page 21*

Khammam Circle

4.20 BHADRACHALAM SOUTH DIVISION

4.20.1 Introduction:

Bhadrachalam South Forest Division lies in the eastern part of Khammam District between latitudes 17^0 27' 42'' and 17^0 54' 05'' N and longitudes 81^0 05' 45'' and 81^0 48' 47'' E. Geographical Area of the Division is 1737.52 Km^2 which is 10.84 % of the area of the District. The main rivers of the Division are Godavari, Sabari and Sileru. The Godavari river forms the southern boundary and Sileru river forms the northern boundary of the Division.

Land use pattern of the Division is given in Table 4.20.1

The climate of this Division is generally cool and pleasant with temperatures ranging from 17^0C to 37^0C and the annual rainfall is about 1362 mm, received mainly from Southwest monsoons.

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

Population of the Division is 0.092 million (2011 Census), per capita forest area 1.4 Ha and the population density 53 persons per Km^2.

Table 4.20.1: Land use Pattern

Land use	Area in SqKm	Percentage
Forest including Scrub	1255.59	72.24
Agriculture	203.03	11.68
Land with Scrub	37.40	2.15
Fallow Lands	178.75	10.28
Grasslands	1.04	0.06
Settlements	0.49	0.03
Vegetation outside Forest	37.34	2.15
Water Bodies	24.35	1.40
Total	**1738.00**	

4.20.2 Recorded Forest Area:

The notified forest area of the Division is **1632.27 Km^2** which is 93.92% of the geographical area. Reserved, Protected and Un-classed forests comprise of 1076.69 Km^2 (65.96%), 479.53 Km^2 (29.38%) and 76.05 Km^2 (4.66%) of the forest area respectively.

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

4.20.3 Protected Area:

The Division is one of the 4 constituent Divisions of Papikonda Wildlife Sanctuary. An area of 271.94 Km^2 of the Division is included in the Papikonda Wildlife Sanctuary.

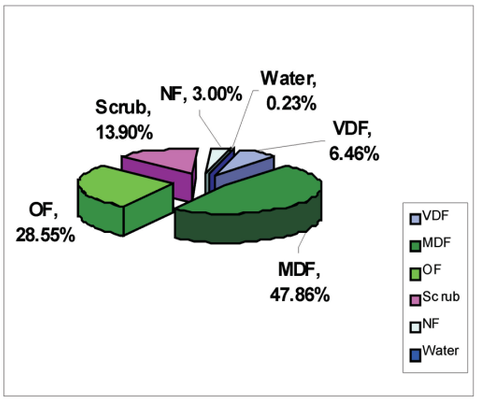
4.20.4 Community Forest Management:

There are 40 Vana Samrakshana Samities (VSSs) or Joint- Forest Protection Committees (JFPCs) in the Division. An area of 86.88 Km^2 forests, constituting 6.72 % of the forest area, is under the management of the VSSs.

4.20.5 Forest Cover:

The forest cover in the Division based on the interpretation of IRS P6 LISS III 2010 data (Dec 2010-Jan 2011) is **1072.08 Km^2**, which is 61.68% of the geographical area. In terms of the forest canopy density classes the Division has 83.57 Km^2 of Very Dense Forests, 619.16 Km^2

Fig 4.20.1



of Moderately Dense Forests and 369.35 Km^2 of Open Forests. The area of the Scrub is 179.74 Km^2, Non-Forest 38.84 Km^2 and Water Bodies 3.00 Km^2. 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 imageries of 2009 and 2010 are shown in Figs 4.20.2 & 4.20.3 respectively and the changes between the periods on the image of 2010.

Comparison of the current forest cover with that of previous assessment year shows a **negative change in forest cover of 434.12 Ha**. The forest cover change matrix, given in Table 4.20.2 reveals that there is a decrease of 75.22 Ha of moderately dense forest, 358.9 Ha of open forest.

The total negative change (including scrub) of 541.36 Ha is on account of encroachments and as the negative change due to encroachment is taken as loss of Forest cover, the **net loss of forest cover is 541.36 Ha** in the Division.

Fig 4.20.2

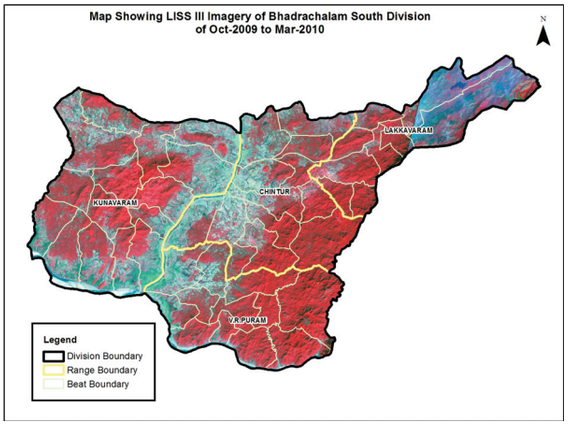
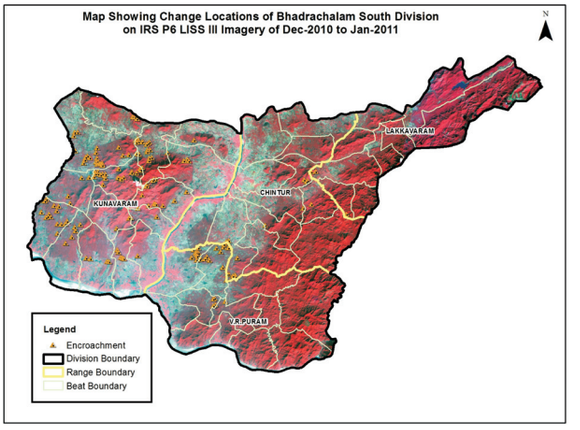


Fig 4.20.3



There are 48 Beats in the Division. Negative changes in forest cover are seen in 26 Beats.There are no changes in the forest cover of the remaining 22 Beats.

Details of forest cover changes in these 26 Beats is shown in Table 4.20.3

Table 4.20.2: Forest Cover change matrix **(Area in Km^2)**

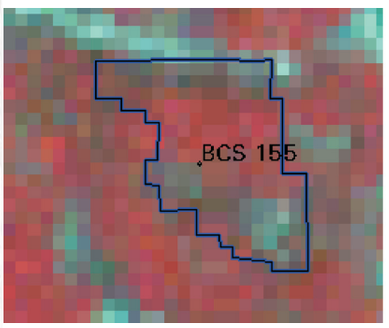
2009	2010						Total of 2009
	VDF	MDF	OF	Scrub	NF	WB	
Very Dense Forest	83.57	0.00	0.00	0.00	0.00	0.00	**83.57**
Moderately Dense Forest	0.00	619.16	0.00	0.62	0.13	0.00	**619.91**
Open Forest	0.00	0.00	369.35	3.06	0.53	0.00	**372.94**
Scrub	0.00	0.00	0.00	176.06	1.07	0.00	**177.13**
Non-Forest	0.00	0.00	0.00	0.00	37.11	0.00	**37.11**
Water	0.00	0.00	0.00	0.00	0.00	3.00	**3.00**
Total of 2010	**83.57**	**619.16**	**369.35**	**179.74**	**38.84**	**3.00**	**1293.66**
Net Change	0.00	-0.75	-3.59	2.61	1.73	0.00	

Table 4.20.3 : List of Beats with negative change in Forest Cover (Area in Ha)

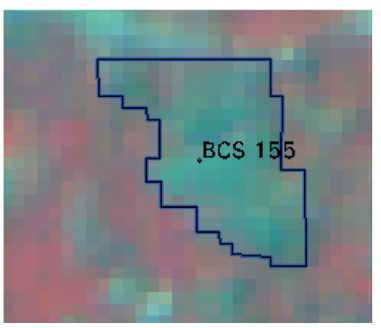
Beat	VDF	MDF	OF	Scrub	NF	WB	Total	Net Change	Encroachments
CHINTUR RANGE									
Chadalawada	325.55	1063.56	469.45	237.58	38.86	0.00	2135.00	-1.84	1.84
Kansulur	28.66	845.21	565.32	213.33	29.08	0.00	1681.60	-4.32	4.32
Kondapalli	77.69	669.54	754.20	333.78	57.15	1.75	1894.11	-4.13	4.13
Kundulur	464.51	1138.07	461.14	313.80	64.65	0.00	2442.17	-1.68	1.68
Tellavarigudem	38.09	741.91	999.95	690.86	168.11	0.00	2638.92	-33.18	33.18
Total	**934.50**	**4458.29**	**3250.06**	**1789.35**	**357.85**	**1.75**	**10791.80**	**-45.15**	**45.15**
KUNAVARAM RANGE									
Bodanuru	5.81	533.24	565.45	270.67	72.09	1.78	1449.04	-22.41	22.41
Buradagudem	58.55	825.86	814.07	825.24	203.44	3.29	2730.45	-8.68	8.68
Chinanarsingapet	0.00	1074.83	1083.68	238.88	99.70	8.36	2505.45	-15.20	15.20
E.D. Pally	16.16	1542.27	1873.85	2402.03	856.00	6.55	6696.86	-58.18	58.18
G.K.Gudem	0.00	263.17	288.54	208.21	28.96	0.00	788.88	-3.14	3.14
Kuturu	170.88	1112.51	824.20	552.46	74.86	1.62	2736.53	-26.83	26.83
Maddigudem	324.39	1380.23	1064.04	269.17	29.72	0.00	3067.55	-42.63	42.63
Murumuru	1.06	1352.16	724.46	241.36	43.86	0.00	2362.90	-41.28	41.28
Narakonda	86.24	1293.04	872.37	1322.70	171.86	3.99	3750.20	-3.27	3.27
Pochavaram	3.18	1177.74	958.75	220.28	11.85	3.10	2374.90	-16.01	16.01
Sarivela	192.16	982.20	1256.88	1083.99	95.73	2.25	3613.21	-27.10	27.10
Singannagudem	1.66	406.45	394.67	80.29	1.22	0.00	884.29	-2.87	2.87
Tekulabore	21.76	876.92	318.29	130.22	18.36	0.00	1365.55	-1.79	1.79
Thatilanka	21.08	1528.22	1110.37	279.80	45.86	2.03	2987.36	-9.99	9.99
Uppanapalli	218.28	1441.97	940.08	211.68	45.36	0.00	2857.37	-17.33	17.33
Total	**1121.21**	**15790.81**	**13089.70**	**8336.98**	**1798.87**	**32.97**	**40170.54**	**-296.71**	**296.71**
LAKKAVARAM RANGE									
Lakkavaram	353.42	1541.37	747.17	471.76	104.03	1.39	3219.14	-3.46	3.46
Mittawada	206.42	948.72	463.58	25.00	24.50	0.15	1668.37	-4.30	4.30
Total	**559.84**	**2490.09**	**1210.75**	**496.76**	**128.53**	**1.54**	**4887.51**	**-7.76**	**7.76**
V.R.PURAM RANGE									
Chintaregupalli	0.00	214.24	331.00	218.83	76.52	0.00	840.59	-71.99	71.99
Darapalli	95.87	1285.04	561.94	45.24	3.10	0.00	1991.19	-10.01	10.01
Peddamattapalli	0.00	512.11	1040.30	485.36	341.67	3.07	2382.51	-101.17	101.17
Ummadivaram	1.50	669.81	750.48	165.55	13.71	1.76	1602.81	-8.57	8.57
Total	**97.37**	**2681.20**	**2683.72**	**914.98**	**435.00**	**4.83**	**6817.10**	**-191.74**	**191.74**
Grand Total	**2712.92**	**25420.39**	**20234.23**	**11538.07**	**2720.25**	**41.09**	**62666.95**	**-541.36**	**541.36**

Satellite Images

2009



2010



Longitude	81.37157^0 E
Latitude	17.55950^0 N
Area in Ha	10.01
Change	OF to Scrub
Compt No	62
Beat	Darapalli
Range	V.R.Puram
Division	Bhadrachalam South

4.21 KHAMMAM DIVISION

4.21.1 Introduction:

Khammam Forest Division lies in the southern part of Khammam district between latitudes 16^0 46' 2'' and 17^0 33' 35'' N and longitudes 79^0 48' 10'' and 81^0 16' 37'' E. Geographical area of the Division is 6027 Km^2 which is 37.6% of the area of the district. The rivers in this Division are Munneru, Paleru, Akheru and Wyra.

Land use pattern of the Division is given in Table 4.21.1

Table 4.21.1: Land use Pattern

Land use	Area in SqKm	Percentage
Forest including Scrub	1242.49	20.62
Agriculture	4166.08	69.12
Land with Scrub	126.96	2.11
Fallow Lands	18.75	0.31
Grasslands	0.00	0.00
Settlements	78.02	1.29
Vegetation outside Forest	303.10	5.03
Water Bodies	91.61	1.52
Total	**6027**	

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

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

Population of the Division is 1.58 million (2011 Census), per capita forest area is 0.08 Ha and the population density is 263 persons per Km^2.

4.21.2 Recorded Forest Area:

The notified forest area of the Division is **1246.19 Km^2** which is 20.68% of the geographical area. Reserved, Protected and Un-classed forests constitute 1131.25 Km^2 (90.78 %), 112.74 Km^2 (9.04%) and 2.2 Km^2 (0.18%) of the forest area respectively.

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

4.21.3 Protected Area:

There is no Protected Area in the Division.

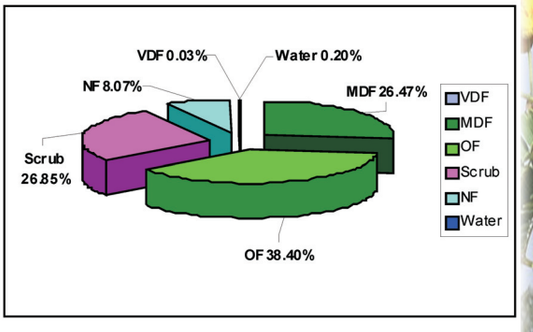
4.21.4 Community Forest Management:

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

4.21.5 Forest Cover:

The forest cover in the Division based on the interpretation of IRS P6 LISS III 2010 data (Dec 2010) is **858.11 Km^2** which is 14.23% of the geographical area. In terms of the forest canopy density classes the Division has 0.41 Km^2 Very Dense Forests,

Fig 4.21.1



349.97 Km^2 Moderately Dense Forests and 507.73 Km^2 Open Forest. The area of the Scrub is 355 Km^2, Non-Forest 106.65 Km^2 and Water Bodies 2.58 Km^2. The distribution of the forest cover of the Division is shown in Fig 4.21.1.

4.21.6 Change in Forest Cover:

The satellite images of 2009 and 2010 are shown in Figs. 4.21.2 & 4.21.3 respectively and the changes during this period are shown on the image of 2010.

Comparison of the current forest cover with that of previous assessment year shows a **negative change of 562.94 Ha**. The forest cover change matrix given in Table 4.21.2 reveals that there is a decrease of 108.26 Ha of moderately dense forest, 454.68 Ha of open forest and 84.96 Ha of scrub.

The total negative change (including scrub) is 647.9 Ha. Out of this 202.80 Ha is on account of clearance of jungle growth for raising of plantations, 65.02 Ha is on account of diversion of forest lands for on-forestry purposes and 380.08 Ha is on account of encroachments. As clearance of jungle growth for raising of plantations and diversion land 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 380.08 Ha** in the Division.

Fig 4.21.2

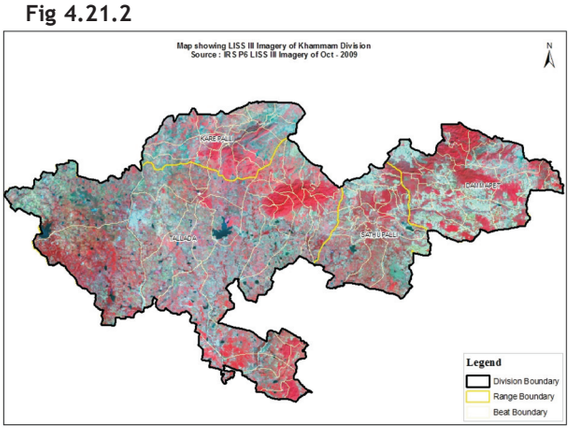
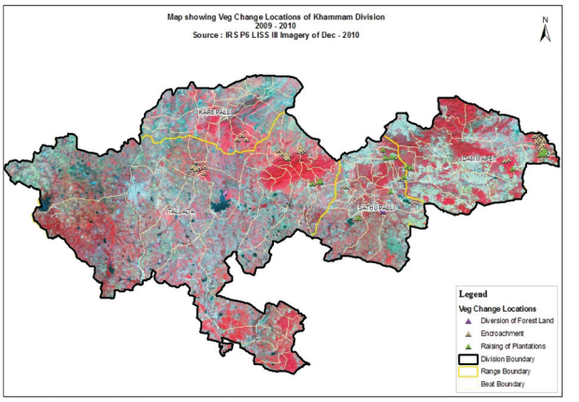


Fig 4.21.3



There are 82 Beats in the Division. Negative changes are noticed in 22 Beats. There are no changes in the remaining 60 Beats.

Details of forest cover changes in these 22 Beats are shown in Table 4.21.3.

Table 4.21.2: Forest Cover change matrix (Area in Km^2)

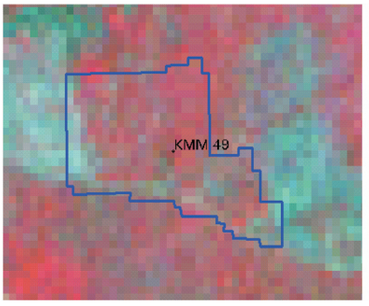
2009	2010						Total of 2009
	VDF	MDF	OF	Scrub	NF	WB	
Very Dense Forest	0.41	0.00	0.00	0.00	0.00	0.00	**0.41**
Moderately Dense Forest	0.00	349.97	0.00	0.00	1.08	0.00	**351.05**
Open Forest	0.00	0.00	507.73	0.00	4.55	0.00	**512.28**
Scrub	0.00	0.00	0.00	355.00	0.85	0.00	**355.85**
Non-Forest	0.00	0.00	0.00	0.00	100.17	0.00	**100.17**
Water	0.00	0.00	0.00	0.00	0.00	2.58	**2.58**
Total of 2010	**0.41**	**349.97**	**507.73**	**355.00**	**106.65**	**2.58**	**1322.34**
Net Change	0.00	-1.08	-4.55	-0.85	6.48	0.00	

Table 4.21.3: List of Beats with negative change in Forest Cover (Area in Ha)

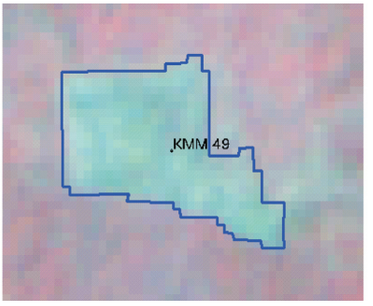
Beat	VDF	MDF	OF	Scrub	NF	WB	Total	Net Change	Encroachments
DAMMAPET RANGE									
Anantharam	1.85	858.68	899.78	392.36	185.36	12.95	2350.98	-74.30	61.85
Gopannagudem	0.00	638.14	595.6	537.49	127.13	0.73	1899.09	-25.14	5.38
Nagupalli	0.00	881.91	1192.9	136.23	94.6	1.63	2307.27	-1.80	0.00
Narayanapuram	0.00	600.62	1478.92	641.89	99.32	13.94	2834.69	-5.02	5.02
Vinayakapuram	0.00	879.89	1634.67	589.06	271.47	0.00	3375.09	-21.74	20.64
Total	**1.85**	**3859.24**	**5801.87**	**2297.03**	**777.88**	**29.25**	**12767.1**	**-128**	**92.89**
KAREPALLI RANGE									
Kesupalli	0.00	74.02	762.18	941.63	175.28	0.00	1953.11	-9.87	9.87
Total	**0.00**	**74.02**	**762.18**	**941.63**	**175.28**	**0.00**	**1953.11**	**-9.87**	**9.87**
SATHUPALLI RANGE									
Buggapadu	0.00	126.9	591.66	410.64	274.77	11.21	1415.18	-60.30	58.57
Chowdaram	0.00	15.32	250.79	337.23	149.66	0.00	753.00	-37.67	37.67
Gollagudem	0.00	2.75	121.07	239.87	278.4	62.56	704.65	-55.59	0.00
Kakarlapalli	0.00	104.84	642.00	697.85	351.7	1.06	1797.45	-8.19	0.00
Pentalam	0.00	517.31	894.16	299.86	450.3	0.00	2161.63	-46.26	0.00
Sathupalli	0.00	18.99	437.69	391.51	372.51	1.45	1222.15	-65.02	0.00
Total	**0.00**	**786.11**	**2937.37**	**2376.96**	**1877.34**	**76.28**	**8054.06**	**-273.03**	**96.24**
TALLADA RANGE									
Arkalpadu	0.00	192.37	250.48	695.37	109.1	2.66	1249.98	-43.75	43.75
Erlapudi	6.01	277.97	332.35	810.52	203.63	1.89	1632.37	-41.39	41.39
Gubbagurthi	0.00	298.00	642.2	427.8	56.04	0.73	1424.77	-3.36	3.36
Gundepudi	0.00	62.13	368.91	633.33	272.72	0.69	1337.78	-3.72	3.72
Lingagudem	0.00	174.97	328.00	270.03	130.42	0.00	903.42	-44.08	0.00
Nacharam	0.00	504.27	678.19	396.27	93.89	0.00	1672.62	-28.57	28.57
Nallabandabodu	0.00	1062.29	979.71	319.10	89.04	0.00	2450.14	-27.32	27.32
Ravikampad	0.00	213.71	975.67	463.27	135.58	0.00	1788.23	-31.11	31.11
Tallapenta	0.00	1130.47	616.50	206.42	211.01	5.89	2170.29	-11.84	0.00
Tummalapalli	0.00	98.64	347.14	578.69	158.69	4.72	1187.88	-1.86	1.86
Total	**6.01**	**4014.82**	**5519.15**	**4800.8**	**1460.12**	**16.58**	**15817.5**	**-237**	**181.08**
Grand Total	**7.86**	**8734.19**	**15020.6**	**10416.4**	**4290.62**	**122.11**	**38591.8**	**-647.9**	**380.08**

Satellite Images

2009



2010



Longitude	80.81641^0 E
Latitude	17.34086^0 N
Area in Ha	7.38
Change	MDF to NF
Compt No	132
Beat	Pentalam
Range	Sathupalli
Division	Khammam

Khammam Circle

4.22 KOTHAGUDEM DIVISION

4.22.1 Introduction:

Kothagudem Forest Division lies in the western part of Khammam district between latitudes 17^0 19' 55'' and 18^0 4' 49'' N and longitudes 80^0 02' 46'' and 80^0 50' 44'' E. Geographical area of the Division is 2503 Km^2 which is 15.62 % of the geographical area of the district. Pancha Pandvulu is the highest peak of this Division with an altitude of 729.38 M above MSL. The area is undulating and interrupted with hills and hillocks of igneous rocks with elevation ranging from 12 M to 500 M. Kalakandavagu stream forms major source of water for Bayyaram cheruvu. Morredu river and Kinnerasani river are the perennial sources of water in this Division.

Land use pattern of the Division is given in Table 4.22.1

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

Table 4.22.1: Land use Pattern

Land use	Area in SqKm	Percentage
Forest including Scrub	1412.13	56.42
Agriculture	879.50	35.14
Land with Scrub	72.86	2.91
Fallow Lands	22.30	0.89
Grasslands	0.49	0.02
Settlements	20.80	0.83
Vegetation outside Forest	75.75	3.03
Water Bodies	19.17	0.77
Total	**2503.00**	

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

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

4.22.2 Recorded Forest Area:

The notified forest area of the Division is **1538.04 Km^2** which is 61.45% of the geographical area. Reserved and Protected forests constitute 1321.03 Km^2 (85.89%) and 217.01 Km^2 (14.11%) of the forest area respectively. **103.50 Km^2** of notified forest area of the Division is transferred to **Paloncha WLM Division**.

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

4.22.3 Protected Area:

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

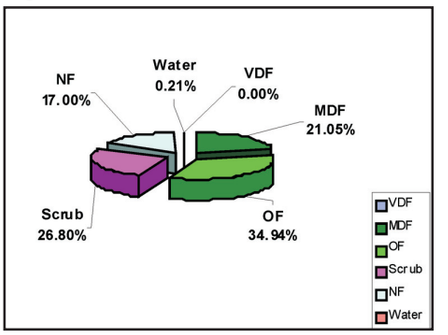
4.22.4 Community Forest Management:

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

4.22.5 Forest Cover:

The forest cover in the Division based on the interpretation of IRS P6 LISS III 2010 data (Oct 2010) is **938.54 Km^2** which is 37.48% of the geographical area. In terms of the forest canopy density classes the Division

Fig 4.22.1



has 0.04 Km^2 of Very Dense Forests, 353.96 Km^2 Moderately Dense Forests and 584.54 Km^2 Open Forest. The area of the Scrub is 451.79 Km^2, Non-Forest 290.04 Km^2 and Water Bodies 3.51 Km^2. The distribution of the forest cover of the Division is shown in Fig 4.22.1

4.22.6 Change in Forest Cover:-

The Satellite image of 2009 and 2010 are shown in Figs 4.22.2 & 4.22.3 respectively and the changes during this period are shown on the image of 2010.

Comparison of the current forest cover with that of previous assessment year shows a **negative change of 608.04 Ha**. The forest cover change matrix given in Table 4.22.2 reveals that there is a decrease of 43.91 Ha in moderately dense forest and 387.21 Ha in open forest.

The positive change of 88.46 Ha is on account of growth in raised plantations. The total negative change (including scrub) is 689.27 Ha in which 185.74 Ha is on account of harvesting of plantations, 14.82 Ha is on account of diversion of forestlands for non-forestry purposes and 488.71 Ha is on account of encroachments. As raising of plantations, harvesting of plantations and diversion land are forest management interventions the same are not considered as loss of forest cover. Thus only the negative change due to encroachment is taken as loss of forest cover. Therefore the **net loss of forest cover** is **488.71 Ha** only in the Division.

Fig 4.22.2

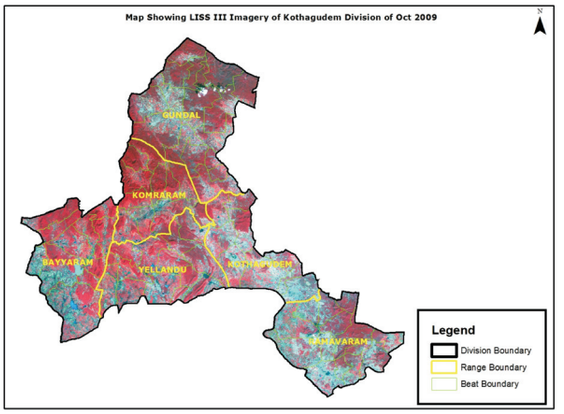
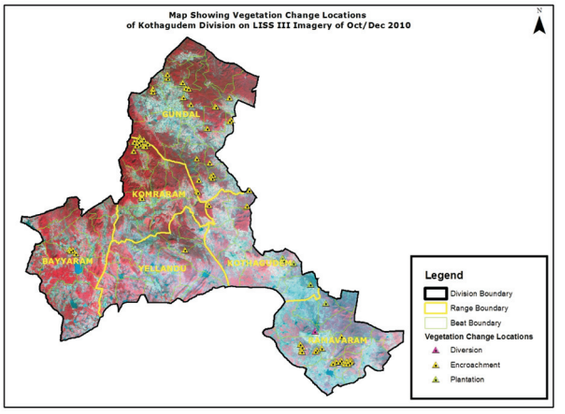


Fig 4.22.3



There are 76 Beats in the Division. Negative changes in forest cover are noticed in 27 Beats and positive change in 1 Beat. There are no changes in the remaining 48 Beats.

Details of forest cover changes in these 28 Beats are shown in Table 4.22.3.

Table 4.22.2: Forest Cover change matrix (Area in Km^2)

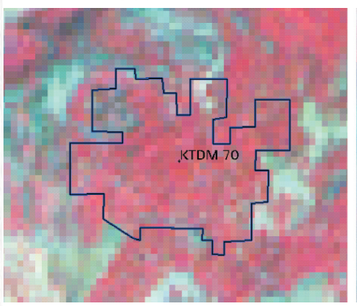
2009	2010						Total of 2009
	VDF	MDF	OF	Scrub	NF	WB	
Very Dense Forest	0.04	0.00	0.00	0.00	0.00	0.00	**0.04**
Moderately Dense Forest	0.00	353.96	0.00	0.42	0.02	0.00	**354.40**
Open Forest	0.00	0.00	583.66	1.85	2.91	0.00	**588.42**
Scrub	0.00	0.00	0.00	449.52	1.70	0.00	**451.22**
Non-Forest	0.00	0.00	0.88	0.00	285.41	0.00	**286.29**
Water	0.00	0.00	0.00	0.00	0.00	3.51	**3.51**
Total of 2010	**0.04**	**353.96**	**584.54**	**451.79**	**290.04**	**3.51**	**1683.88**
Net Change	0.00	-0.44	-3.88	0.57	3.75	0.00	

Table 4.22.3: List of Beats with change in Forest Cover (Area in Ha)

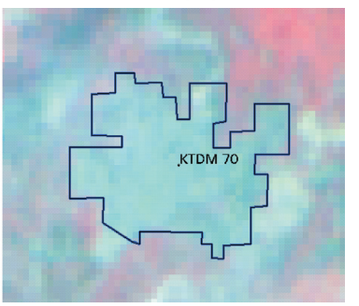
Beat	VDF	MDF	OF	Scrub	NF	WB	Total	Net Change	Encroachments
BAYYARAM RANGE									
Kachanpalli	0.00	599.62	427.76	209.73	131.55	0.61	1369.27	-14.37	14.37
Karukonda	0.00	216.04	701.62	1123.44	735.45	3.00	2779.55	-20.63	20.63
Total	**0.00**	**815.66**	**1129.38**	**1333.17**	**867**	**3.61**	**4148.82**	**-35.00**	**35.00**
GUNDAL RANGE									
Damaratogu West	0.00	1364.77	1146.57	387.01	58.61	0.00	2956.96	-9.17	9.17
Dongatogu	0.00	3317.84	1479.16	525.78	207.53	10.76	5541.07	-27.98	27.98
Gundala	0.00	390.42	2894.59	1341.82	933	13.52	5573.35	-9.81	9.81
Jinnelagudem	0.00	73.81	637.76	387.56	133.2	0.00	1232.33	-26.55	26.55
Karnigudem	0.00	2498.52	995.6	754.13	596.39	1.77	4846.41	-40.85	40.85
Kodavatancha	0.00	322.51	1230.61	1207.71	999.64	12.09	3772.56	-11.17	11.17
Narsapuram	0.00	76.47	1377.99	1004.63	254.56	0.00	2713.65	-6.87	6.87
Ravigudem	0.00	76.08	691.94	252.46	71.45	0.00	1091.93	-4.77	4.77
Sayanpalli	0.00	127.87	422.56	1096.61	1289.95	21.38	2958.37	-3.11	3.11
Valasala	0.00	181.79	608.12	1117.63	1000.97	10.37	2918.88	-5.32	5.32
Total	**0.00**	**8430.08**	**11484.9**	**8075.34**	**5545.3**	**69.89**	**33605.5**	**-145.6**	**145.6**
KOMARARAM RANGE									
Manikyaram	0.00	853.16	798.64	392.01	482.64	0.00	2526.45	-12.06	12.06
Shammunigudem	0.00	1110.46	645.34	190.01	44.8	1.43	1992.04	-2.25	2.25
Vennelbail	0.00	612	1363.94	261.49	115.35	0.55	2353.33	-27.38	27.38
Total	**0.00**	**2575.62**	**2807.92**	**843.51**	**642.79**	**1.98**	**6871.82**	**-41.69**	**41.69**
KOTHAGUDEM RANGE									
Chatakonda	0.00	0.00	140.8	1085.25	603.86	2.79	1832.7	-37.70	0.00
Koppurai	0.00	409.73	660.3	942.74	483.61	11.68	2508.06	-2.96	2.96
Medlamadugu	0.00	115.64	937.62	588.59	320.63	0.00	1962.48	-97.15	0.00
Murlipad	0.00	317.51	1032.44	483.72	187.62	3.63	2024.92	-11.77	11.77
Total	**0.00**	**842.88**	**2771.16**	**3100.3**	**1595.72**	**18.1**	**8328.16**	**-149.58**	**14.73**
RAMAVARAM RANGE									
Abbugudem	0.00	12.74	350.49	303.9	226.17	0.00	893.3	-120.19	120.19
Damarachrla	0.00	2.12	310.57	477.76	254.72	49.55	1094.72	-38.30	38.30
Gareebpet	0.00	0.00	415.35	734.58	419.28	0.00	1569.21	-14.82	0.00
Marrigudem	0.00	19.11	700.38	478.06	299.52	0.00	1497.07	-17.08	17.08
Penagadapa	0.00	2.28	239.19	140.74	714.33	0.00	1096.54	-27.77	27.77
Penuballi	0.00	165.64	1272.85	891.85	347.41	0.00	2677.75	-50.89	0.00
Satyampet	0.00	470.08	1797.79	282.15	91.03	0.00	2641.05	-14.96	14.96
Thippanpalli	0.00	0.00	231.43	795.36	790.57	0.00	1817.36	58.22	30.24
Total	**0.00**	**671.97**	**5318.05**	**4104.40**	**3143.03**	**49.55**	**13287.00**	**-225.79**	**248.54**
YELLANDU RANGE									
Dharmapur	0.00	549.55	1339.49	546.41	278.96	1.72	2716.13	-3.15	3.15
Total	**0.00**	**549.55**	**1339.49**	**546.41**	**278.96**	**1.72**	**2716.13**	**-3.15**	**3.15**
Grand Total	**0.00**	**13885.76**	**24850.90**	**18003.13**	**12072.80**	**144.85**	**68957.44**	**-600.81**	**488.71**

Satellite Images

2009



2010



Longitude	80.69675^0 E
Latitude	17.39954^0 N
Area in Ha	38.30
Change	OF to Scrub
Compt No	34
Beat	Damaracharla
Range	Ramavaram
Division	Kothagudem

4.23 PALONCHA DIVISION

4.23.1 Introduction:

Paloncha Forest Division lies in the central part of Khammam district between latitudes 17^0 19' 4'' and 18^0 09' 10'' N and longitudes 80^0 25' 56'' and 81^0 30' 17'' E. Geographical Area of the Division is 2530 Km^2 which is 15.78 % of the geographical area of the District. The elevation varies from 12 M to 600 M above MSL in this Division. Godavari River forms the north-eastern boundary of the Division. Other rivers in the Division are Kinnerasani, Pamleru and Morredu which almost dry up in summer. Besides these rivers few big tanks like Tummalachervu, Parentalacheruvu also exist in this Division.

Land use pattern of the Division is given in Table 4.23.1

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

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

Table 4.23.1: Land use Pattern

Land use	Area in SqKm	Percentage
Forest including Scrub	1413.37	55.86
Agriculture	813.73	32.16
Land with Scrub	54.10	2.14
Fallow Lands	77.87	3.08
Grasslands	2.06	0.08
Settlements	31.88	1.26
Vegetation outside Forest	72.76	2.88
Water Bodies	64.22	2.54
Total	**2530.00**	

Population of the Division is 0.42 million (2011 Census), per capita forest area is 0.53 Ha and the population density is 123 persons per Km^2.

4.23.2 Recorded Forest Area:

The notified forest area of the Division is **2156.62 Km^2** which is 85.24% of the geographical area. Reserved, Protected and Un-classed forests constitute 1545.8 Km^2 (71.68%), 498.04 Km^2 (23.09%) and 112.78 Km^2 (5.23%) of the forest area respectively. However an area of 582.88 Km^2 of notified forests of the Division has since been transferred to constitute Paloncha WLM Division.

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

4.23.3 Protected Area:

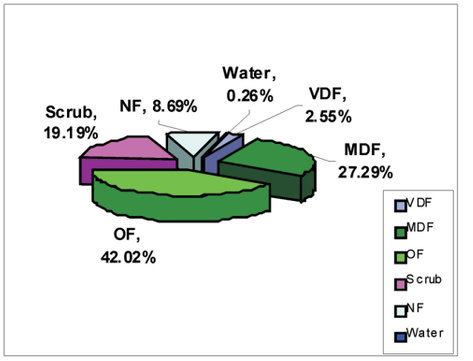
No Protected Area exists in this Division after carving out of WLM Paloncha Division.

4.23.4 Community Forest Management:

There are 137 Vana Samrakshana Samithies (VSSs) in the Division. An area of 284.24 Km^2 of forests, which is 18.66 % of notified forests , is under the management of VSSs.

4.23.5 Forest Cover:

Fig 4.23.1



The forest cover in the Division based on the interpretation of IRS P6 LISS III 2010 data (Dec 2010) is **1094.71 Km²** which is 43.27% of the geographical area. In terms of the forest canopy density classes the Division has 38.77 Km² of Very Dense Forests, 415.78 Km² of Moderately Dense Forests and 640.16 Km² of Open Forests. The area of the Scrub is 292.36 Km², Non-Forest 132.43 Km² and Water Bodies 4.02 Km². The distribution of the forest cover of the Division is shown in Fig 4.23.1.

4.23.6 Change in Forest Cover:

The satellite images of 2009 and 2010 are shown in Figs 4.23.2 & 4.23.3 respectively and the changes during this period are shown on the image of 2010.

Comparison of the current forest cover with that of previous assessment year shows a **negative change of 540.86 Ha**. The forest cover change matrix given in Table 4.23.2 reveals that there is a decrease of 94.68 Ha of moderately dense forest, 446.18 Ha of open forest and 156.85 Ha of scrub.

Of the total negative change (including scrub) of 697.71 Ha; 431.53 Ha is on account of clearance of growth for raising of plantations, 31 Ha on account of diversion of forest lands for non-forestry purposes and 235.18 Ha on account of encroachments. As clearance of growth for raising of plantations and diversion under Forest Conservation Act 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 and the **net loss of forest cover is 235.18 Ha**.

Fig 4.23.2

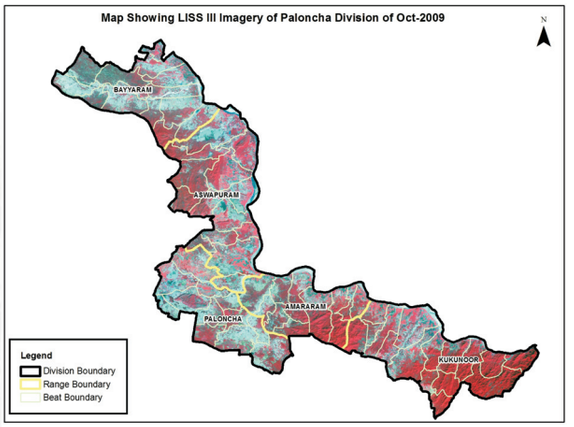
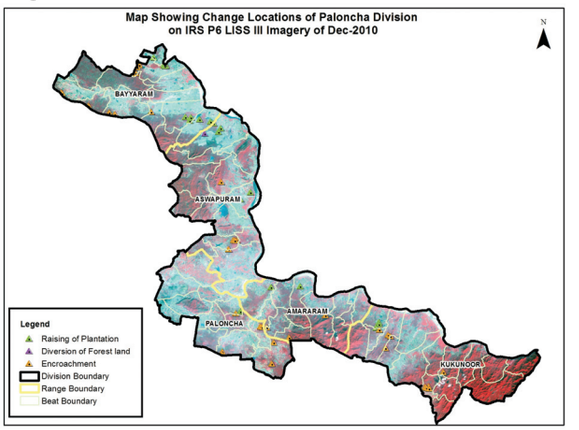
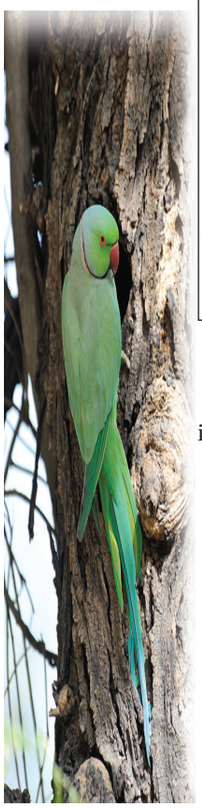


Fig 4.23.3





There are 65 Beats in the Division. Negative changes in forest Cover are noticed in 27 Beats. There are no changes in the remaining 38 Beats.

Details of forest cover changes in these 27 Beats are shown in Table 4.23.3.

Table 4.23.2: Forest Cover change matrix (Area in Km²)

2009	2010						Total of 2009
	VDF	MDF	OF	Scrub	NF	WB	
Very Dense Forest	38.77	0.00	0.00	0.00	0.00	0.00	**38.77**
Moderately Dense Forest	0.00	415.78	0.00	0.89	0.06	0.00	**416.73**
Open Forest	0.00	0.00	640.16	2.45	2.01	0.00	**644.62**
Scrub	0.00	0.00	0.00	289.02	1.57	0.00	**290.59**
Non-Forest	0.00	0.00	0.00	0.00	128.79	0.00	**128.79**
Water	0.00	0.00	0.00	0.00	0.00	4.02	**4.02**
Total of 2010	**38.77**	**415.78**	**640.16**	**292.36**	**132.43**	**4.02**	**1523.52**
Net Change	0.00	-0.95	-4.46	1.77	3.64	0.00	

Table 4.23.3 : List of Beats with negative change in Forest Cover (Area in Ha)

Beat	VDF	MDF	OF	Scrub	NF	WB	Total	Net Change	Encroachments
AMARARAM RANGE									
Amararam	95.63	2316.75	2122.37	344.84	75.34	0.00	4954.93	-3.14	3.14
Gundalapadu	4.69	914.51	1216.77	191.64	13.49	0.00	2341.10	-4.04	4.04
Kothur	0.00	1041.51	1746.28	402.70	140.70	2.12	3333.31	-18.13	0.00
Sridhara	0.00	12.70	1256.76	388.16	195.63	0.00	1853.25	-15.42	0.00
Timmampet	4.91	102.11	1439.54	780.48	196.00	0.00	2523.04	-16.53	16.53
Total	**105.23**	**4387.58**	**7781.72**	**2107.82**	**621.16**	**2.12**	**15005.63**	**-57.26**	**23.71**
ASWAPURAM RANGE									
Aswapuram	6.70	738.21	1350.18	542.88	150.22	2.42	2790.61	-2.79	2.79
Chintriyala	0.00	3.22	87.86	441.38	195.57	0.00	774.49	-62.65	0.00
Kistasagar	0.00	444.66	1070.72	462.51	142.49	0.00	2120.38	-7.25	7.25
Manuguru West	0.00	54.15	1113.44	1585.14	2033.98	19.70	4911.19	-127.83	0.00
Total	**6.70**	**1240.24**	**3622.20**	**3031.91**	**2522.26**	**22.12**	**10596.67**	**-200.52**	**10.04**
BAYYARAM RANGE									
Anantharam	1.07	52.96	393.08	579.86	431.52	4.76	1468.86	-10.40	10.40
Dugnepally	0.00	92.28	97.98	254.68	116.35	0.00	561.29	-43.98	0.00
Gopalraopet	4.75	502.95	857.71	231.22	140.20	0.00	1736.83	-2.40	2.40
Janampet	0.00	598.17	675.19	584.16	445.22	14.46	2317.20	-76.10	47.87
Kalvalnagaram	1.73	227.30	842.57	1038.71	317.38	9.87	2437.56	-4.59	4.59
Karakagudem	5.72	764.29	825.25	413.77	184.36	0.00	2193.39	-9.24	9.24
Kondaigudem	0.00	147.58	1385.35	552.39	280.42	34.79	2400.53	-11.06	0.00
Seethampet	0.00	942.75	1100.44	348.74	336.16	4.77	2732.86	-90.41	0.00
Total	**13.27**	**3328.28**	**6177.57**	**4003.53**	**2251.61**	**68.65**	**15848.52**	**-248.18**	**74.50**
KUKUNOOR RANGE									
Chigurumamidi	82.90	1571.34	1322.61	135.22	11.62	0.00	3123.69	-3.11	3.11
Goparaju Gudem	0.00	105.80	473.26	191.14	98.56	0.00	868.76	-45.26	0.00
Gundambore	0.00	127.39	860.58	422.98	64.46	2.65	1478.06	-9.39	9.39
Kavadigundla North	10.21	979.16	260.08	173.42	57.69	0.69	1481.25	-11.74	11.74
Kukunoor	0.00	457.87	1127.21	268.06	49.52	0.00	1902.66	-6.64	6.64
Lankalapally	0.00	167.88	565.29	238.89	64.54	1.06	1037.66	-7.16	7.16
Total	**93.11**	**3409.44**	**4609.03**	**1429.71**	**346.39**	**4.40**	**9892.08**	**-83.30**	**38.04**
PALONCHA RANGE									
Dantalaboru	0.00	0.00	552.42	328.21	289.79	0.00	1170.42	-54.64	35.08
Mulakalapally	0.00	35.37	1002.21	857.00	525.08	1.17	2420.83	-9.98	9.98
Muthyalampadu	0.00	940.31	1486.95	737.05	251.85	15.44	3431.60	-23.74	23.74
Pogadlapally	0.00	-3.91	290.38	315.88	157.17	1.73	761.25	-20.09	20.09
Total	**0.00**	**971.77**	**3331.96**	**2238.14**	**1223.89**	**18.34**	**7784.10**	**-108.45**	**88.89**
Grand Total	**218.31**	**13337.31**	**25522.48**	**12811.11**	**6965.31**	**115.63**	**59127.00**	**-697.71**	**235.18**

Khammam Circle

4.24 PALONCHA WLM DIVISION

4.24.1 Introduction:

Paloncha WLM Forest Division lies in the central part of Khammam district between latitudes 17^0 35' 11'' and 17^0 59' 54'' N and longitudes 80^0 27' 14'' and 80^0 47' 20'' E. Geographical Area of the Division is 825 Km^2 which is 5.15 % of the geographical area of district. The elevation varies from 12 M to 600 M above Mean Sea Level in this Division. Kinnerasani, Pamleru and Morredy are the important rivers of the district.

Land use pattern of the Division is given in Table 4.24.1

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

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

Table 4.24.1: Land use Pattern

Land use	Area in SqKm	Percentage
Forest including Scrub	622.00	75.39
Agriculture	137.65	16.69
Land with Scrub	20.08	2.43
Fallow Lands	4.29	0.52
Grasslands	0.12	0.01
Settlements	0.38	0.05
Vegetation outside Forest	17.29	2.10
Water Bodies	23.19	2.81
Total	**825.00**	

4.24.2 Recorded Forest Area:

The notified forest area of the Division is **686.38 Km^2**, which is 83.20% of the geographical area.

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

4.24.3 Protected Area:

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

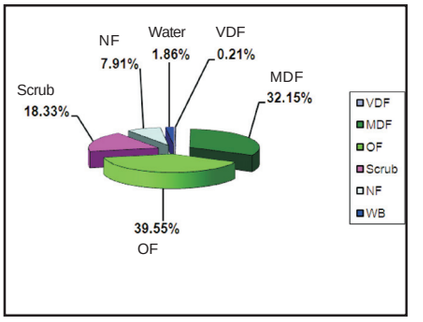
4.24.4 Community Forest Management:

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

4.24.5 Forest Cover:

The forest cover in the Division based on the interpretation of IRS P6 LISS III 2010 data (Dec 2010) is **493.51 Km^2** which is 59.81% of the geographical area. In terms of the forest canopy density classes the Division has 1.43 Km^2 of Very Dense Forests, 220.64 Km^2 of Moderately Dense Forests and 271.44 Km^2 of Open Forest. The area of the Scrub is 125.84 Km^2, Non-Forest 54.28 Km^2 and Water Bodies 12.75 Km^2. The distribution of the forest cover of the Division is shown in Fig 4.24.1.

Fig 4.24.1



4.24.6 Change in Forest Cover:

The Satellite images of 2009 and 2010 are shown in Figs 4.24.2 & 4.24.3 respectively and the changes during this period are shown on the image of 2010.

Comparison of the current forest cover with that of previous assessment year shows a **negative change of 155.64 Ha**. The forest cover change matrix, given in Table 4.24.2 reveals that there is a decrease of 24.47 Ha of moderately dense forest and 131.17 Ha of open forest.

The total negative change (including scrub) is 155.64 Ha in which, 5.92 Ha is on account of harvesting of plantations and 149.72 Ha is on account of encroachments. Harvesting of matured plantations is forest management intervention and hence not considered as loss of forest cover. Thus only the negative change due to encroachment is taken as loss of forest cover. Therefore the **net loss of forest cover is 149.72 Ha** only.

Fig 4.24.2

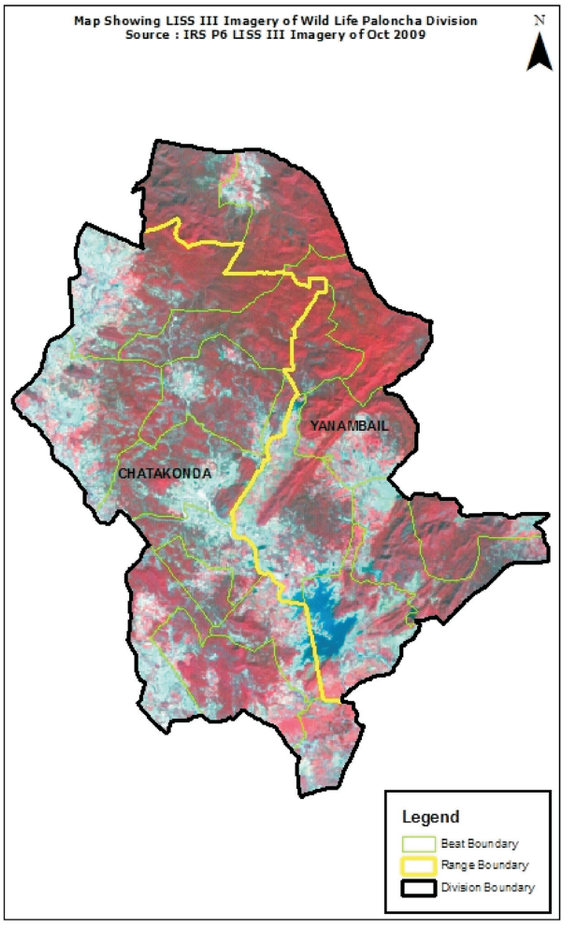
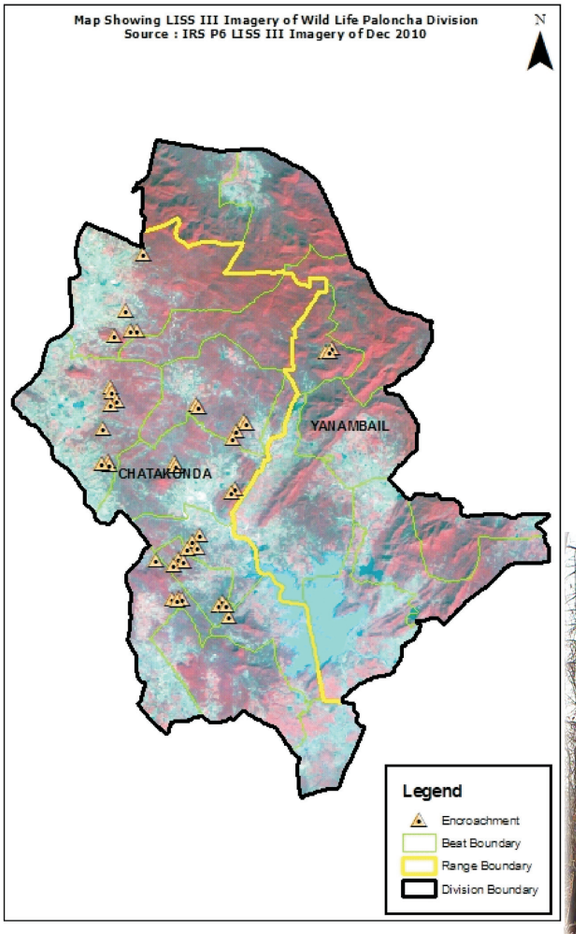


Fig 4.24.3



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

Details of forest cover changes in these 9 Beats are shown in Table 4.24.3.

Table 4.24.2: Forest Cover change matrix (Area in Km^2)

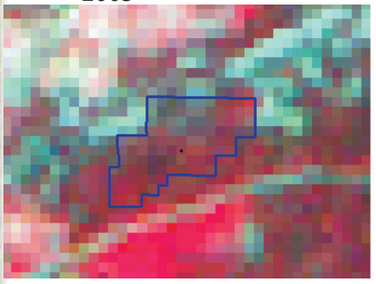
2009	2010						Total of 2009
	VDF	MDF	OF	Scrub	NF	WB	
Very Dense Forest	1.43	0.00	0.00	0.00	0.00	0.00	**1.43**
Moderately Dense Forest	0.00	220.64	0.00	0.04	0.21	0.00	**220.89**
Open Forest	0.00	0.00	271.44	0.48	0.83	0.00	**272.75**
Scrub	0.00	0.00	0.00	125.32	0.00	0.00	**125.32**
Non-Forest	0.00	0.00	0.00	0.00	53.24	0.00	**53.24**
Water	0.00	0.00	0.00	0.00	0.00	12.75	**12.75**
Total of 2010	**1.43**	**220.64**	**271.44**	**125.84**	**54.28**	**12.75**	**686.38**
Net Change	0.00	-0.25	-1.31	0.52	1.04	0.00	

Table 4.24.3 : List of Beats with negative change in Forest Cover (Area in Ha)

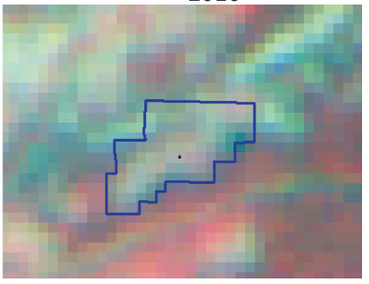
Beat	VDF	MDF	OF	Scrub	NF	WB	Total	Net Change	Encroachments
CHATAKONDA RANGE									
Allapally	0.00	977.12	1554.41	1433.46	884.88	11.62	4861.49	-37.73	37.73
Chinthakunta	0.00	487.25	2552.87	1325.34	683.84	10.68	5059.98	-9.62	9.62
Gangaram	0.67	470.18	828.16	340.16	289.7	0.00	1928.87	-19.75	19.75
Gollagudem	0.00	197.55	853.29	772.71	442.62	80.95	2347.12	-13.46	13.46
Mailaram	0.00	177.6	874.77	821.02	388.33	370.04	2631.76	-3.45	3.45
Markode	16.16	3085.91	1460.48	686.06	274.89	1.13	5524.63	-18.54	12.62
Punukula Chelaka	0.00	127.79	718.21	396.64	180.24	0.00	1422.88	-24.93	24.93
Venkatapuram	0.00	1203.11	2198.75	684.49	224.34	0.61	4311.3	-22.28	22.28
Total	**16.83**	**6726.51**	**11040.9**	**6459.88**	**3368.84**	**475.03**	**28088**	**-149.76**	**143.84**
YANAMBAIL RANGE									
Regulagudem	8.6	940.69	872.36	121.59	3.95	0.00	1947.19	-5.88	5.88
Total	**8.6**	**940.69**	**872.36**	**121.59**	**3.95**	**0.00**	**1947.19**	**-5.88**	**5.88**
Grand Total	**25.43**	**7667.2**	**11913.3**	**6581.47**	**3372.79**	**475.03**	**30035.2**	**-155.64**	**149.72**

Satellite Images

2009



2010



Longitude	80.53513^0 E
Latitude	17.92721^0 N
Area in Ha	5.92
Change	OF to NF
Compt No	59
Beat	Markode
Range	Chatakonda
Division	WLM Paloncha

Promote the recovery of endangered species and ecosystems.

- Earth Charter & Gandhi Page 21

4.25 KADAPA DIVISION

4.25.1 Introduction:

Kadapa Forest Division lies in the middle of Kadapa district between latitudes 13^0 50' 40'' and 14^0 40' 37'' N and longitudes 78^0 13' 9'' and 79^0 14' 39'' E. Geographical area of the Division is 4521 Km^2 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 760 M. The main rivers that flow through Kadapa Division are Penna, Papagni and Mandavi.

Land use pattern of the Division is given in Table 4.25.1

The climate of this Division is generally dry with temperatures ranging from 25^0C to 40^0C and the annual rainfall is about 661.22mm.

The soil types found mainly are red loamy, black cotton and red sandy. The minerals 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^2.

Table 4.25.1: Land use Pattern

Land use	Area in SqKm	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
Total	**4521.00**	

4.25.2 Recorded Forest Area:

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

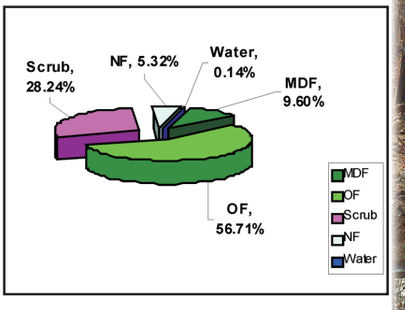
4.25.3 Protected Area:

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

4.25.4 Community Forest Management:

There are 118 Vana Samrakshana Samithies (VSSs) in the Division. 394.08 Km^2 forest area, which constitutes 22.96 % of the forest area, is under the management of the VSSs.

Fig 4.25.1



4.25.5 Forest Cover:

The forest cover in the Division, based on the interpretation of IRS P6 LISS III (Jan 2011) is **1138.22 Km^2** which is 25.17% of the geographical area. In terms of the forest canopy density classes the Division consists of 0.03 Km^2 of Very Dense Forest, 164.81 Km^2 of Moderately Dense Forest and 973.38

Km² of Open Forest. The area of the Scrub is 484.76 Km², Non-Forest is 91.25 Km² and Water Bodies is 2.32 Km². The distribution of the forest cover of the Division is shown in Fig 4.25.1

4.25.6 Change in Forest Cover:

The satellite images of 2009 and 2010 are shown in Figs 4.25.2 & 4.25.3 respectively and the changes between this period are shown on the image of 2010.

Comparison of the current forest cover with that of previous assessment year shows a **negative change in forest cover of 25.71 Ha** and positive change of 9.36 Ha. The forest cover change matrix given in Table 4.25.2 reveals that there is a decrease of 3.43 Ha of Moderately dense forest, 22.28 Ha of open forest and 44.30 Ha of scrub.

The positive change is on account of raising of plantations and the negative change (including scrub) of 60.65 Ha is on account of clearance of growth for raising of plantations. As raising of plantations is a forest management intervention the same is not considered as loss of forest cover. Therefore there is **no loss of forest cover** in this Division.

Fig. 4.25.2

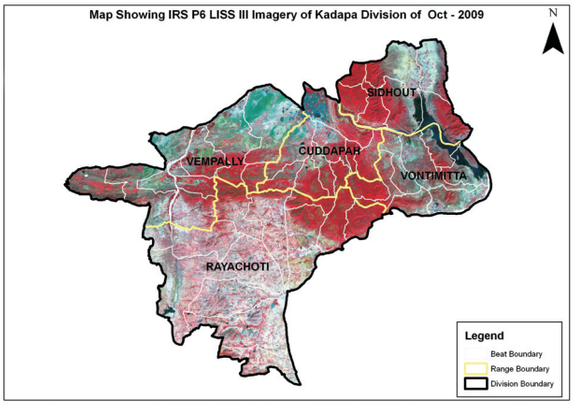
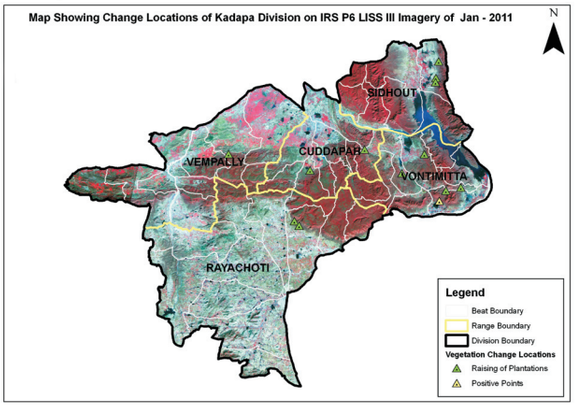


Fig. 4.25.3



There are 44 Beats in the Division. Negative changes in forest cover are noticed in 9 Beats. There are no changes in the remaining 35 Beats.

Details of forest cover changes in these 9 Beats are shown in Table 4.25.3

Table 4.25.2: Forest Cover change matrix (Area in Km²)

2009	2010						Total of 2009
	VDF	MDF	OF	Scrub	NF	WB	
Very Dense Forest	0.03	0.00	0.00	0.00	0.00	0.00	**0.03**
Moderately Dense Forest	0.00	164.81	0.00	0.00	0.03	0.00	**164.84**
Open Forest	0.00	0.00	973.29	0.00	0.22	0.00	**973.51**
Scrub	0.00	0.00	0.00	484.76	0.44	0.00	**485.20**
Non-Forest	0.00	0.00	0.09	0.00	90.56	0.00	**90.65**
Water	0.00	0.00	0.00	0.00	0.00	2.32	**2.32**
Total of 2010	**0.03**	**164.81**	**973.38**	**484.76**	**91.25**	**2.32**	**1716.55**
Net Change	0.00	-0.03	-0.13	-0.44	0.60	0.00	

Table 4.25.3: List of Beats with change in Forest Cover (Area in Ha)

Beat	VDF	MDF	OF	Scrub	NF	WB	Total	Net Change	Encroachments
KADAPA RANGE									
Bhakarapet	0.00	243.87	2,639.27	132.38	7.66	0.00	3023.18	-3.43	0.00
Maddimadgu_East	0.00	203.11	3,064.94	1,302.16	161.77	22.27	4754.25	-4.81	0.00
Total	**0.00**	**446.98**	**5,704.21**	**1,434.54**	**169.43**	**22.27**	**7777.43**	**-8.24**	**0.00**
RAYACHOTI RANGE									
Saraswathipally	0.00	753.74	3,180.99	1,139.52	137.14	0.00	5211.39	-23.68	0.00
Total	**0.00**	**753.74**	**3,180.99**	**1,139.52**	**137.14**	**0.00**	**5211.39**	**-23.68**	**0.00**
SIDHOUT RANGE									
Muthukur	0.00	65.66	2,027.10	1,632.52	503.08	0.00	4228.36	-11.39	0.00
Total	**0.00**	**65.66**	**2,027.10**	**1,632.52**	**503.08**	**0.00**	**4228.36**	**-11.39**	**0.00**
VEMPALLY RANGE									
Yellatur	0.00	446.67	3,282.67	677.81	39.23	0.01	4446.39	-4.55	0.00
Total	**0.00**	**446.67**	**3,282.67**	**677.81**	**39.23**	**0.01**	**4446.39**	**-4.55**	**0.00**
VONTIMITTA RANGE									
Mantapampalli	0.00	4.3	1,263.92	978.61	39.29	5.75	2291.87	-4.96	0.00
Nadimpally	0.00	16.86	1,920.43	849.22	113.62	0.00	2900.13	-9.23	0.00
Nandalur	0.00	42.8	1,787.45	899.57	206.83	0.45	2937.1	7.28	0.00
Vontimitta	0.00	4.62	2,183.33	1,963.55	50.8	5.89	4208.19	-5.88	0.00
Total	**0.00**	**68.58**	**7,155.13**	**4,690.95**	**410.54**	**12.08**	**12337.29**	**-12.79**	**0.00**
Grand Total	**0.00**	**1,781.63**	**21,350.10**	**9,575.34**	**1,259.42**	**34.35**	**34000.85**	**-60.65**	**0.00**

Kurnool Circle

4.26 KURNOOL DIVISION

4.26.1 Introduction:

Kurnool Forest Division lies in the western part of Kurnool district between latitudes $14^0$56'49.56" and $15^0$57'49.68"N and longitudes $76^0$58'26.04" and $78^0$29'22.56"E. Geographical area of the Division is 12,904 Km^2 which is 73.07 % of the area of 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 4.26.1

The climate of this Division is inland tropical monsoonic type with 3 distinct seasons. Temperature ranges from 12^0C to 45^0C 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.

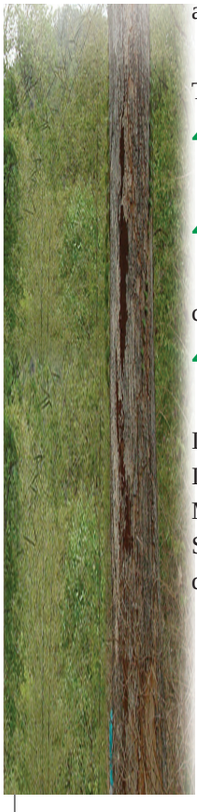
Population of the Division is 3.12 million (2011 Census). The per capita forest area is 0.04 Ha and the population density is 241 persons per Km^2.

Table 4.26.1: Land use Pattern

Land use	Area in SqKm	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
Total	**12904.00**	

4.26.2 Recorded Forest Area:

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



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

4.26.3 Protected Area:

There is no Protected Area in the Division.

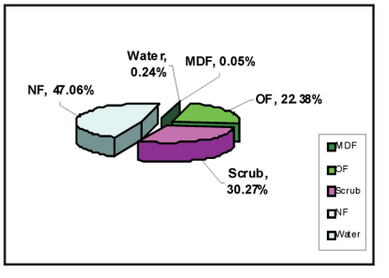
4.26.4 Community Forest Management:

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

4.26.5 Forest Cover:

The forest cover in the Division based on the interpretation of IRS P6 LISS III 2010 data (Jan 2011) is **269.65 Km^2** which is 2.15 % of the geographical area. In terms of the forest canopy cover density classes the Division has 0.56 Km^2 of Moderately Dense Forests and 269.09 Km^2 of Open Forests. The area of the Scrub is 364.04 Km^2, Non-Forests 565.97 Km^2 and Water Bodies 2.89 Km^2. The distribution of the forest cover of the Division is shown in Fig 4.26.1

Fig 4.26.1



4.26.6 Change in Forest cover:

The satellite images of 2009 and 2010 are shown in Figs 4.26.2 & 4.26.3 respectively and the changes between this period are shown on the image of 2010.

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 4.26.2 reveals that there is a loss of 6.67 Ha of scrub.

The negative change of 6.67 Ha is on account of diversion of forest land for non-forestry purpose. As diversion of forest land is permitted under the Forest Conservation Act, 1980 duly following the procedure and as would be compensated with CA & CA plantation, hence the same is not considered as loss of forest cover. Therefore there is **no net loss of forest cover** in the Division.

Fig : 4.26.2

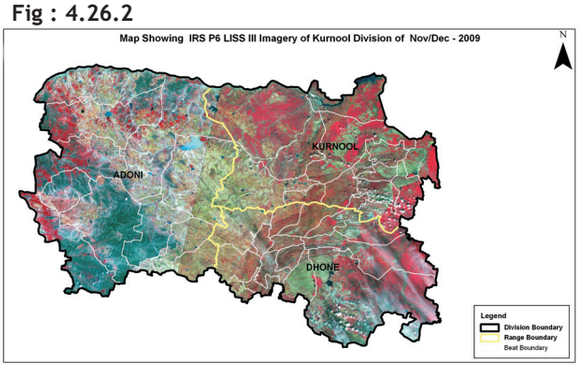
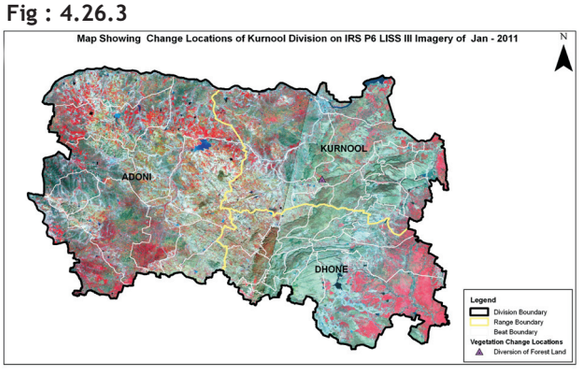


Fig : 4.26.3



There are 40 Beats in the Division. Negative change in forest cover is noticed only in 1 Beat. There are no changes in the remaining 39 Beats.

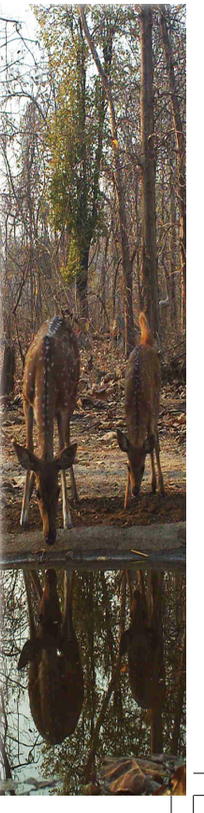
Details of forest cover changes in the Beat Ramallakote is shown in Table 4.26.3.

Table 4.26.2: Forest Cover change matrix (Area in Km^2)

2009	2010						Total of 2009
	VDF	MDF	OF	Scrub	NF	WB	
Very Dense Forest	0.00	0.00	0.00	0.00	0.00	0.00	**0.00**
Moderately Dense Forest	0.00	0.56	0.00	0.00	0.00	0.00	**0.56**
Open Forest	0.00	0.00	269.09	0.00	0.00	0.00	**269.09**
Scrub	0.00	0.00	0.00	364.04	0.07	0.00	**364.11**
Non-Forest	0.00	0.00	0.00	0.00	565.90	0.00	**565.90**
Water	0.00	0.00	0.00	0.00	0.00	2.89	**2.89**
Total of 2010	**0.00**	**0.56**	**269.09**	**364.04**	**565.97**	**2.89**	**1202.55**
Net Change	0.00	0.00	0.00	-0.07	0.07	0.00	

Table 4.26.3 : List of Beats with negative change in Forest Cover (Area in Ha)

Beat	VDF	MDF	OF	Scrub	NF	WB	Total	Net Change	Encroachments
KURNOOL RANGE									
Ramallakota	0.00	1.37	955.6	662.63	348.73	0.00	1968.33	-6.67	0.00
Total	**0.00**	**1.37**	**955.6**	**662.63**	**348.73**	**0.00**	**1968.33**	**-6.67**	**0.00**
Grand Total	**0.00**	**1.37**	**955.6**	**662.63**	**348.73**	**0.00**	**1968.33**	**-6.67**	**0.00**



Kurnool Circle

4.27 NANDYAL DIVISION

4.27.1 Introduction:

Nandyal Forest Division lies in the south-eastern part of Kurnool district between latitudes $14^0$53'58.56" and $15^0$40'58.08"N and longitudes $78^0$20'27.6" and $78^0$46'40.08" E. Geographical area of the Division is 2,600 Km^2 which is 14.73 % of the geographical area of district. The rock formation consists of purple shaley lime stone, shale flags, grey limestone 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 4.27.1

The climate of this Division is generally dry with temperatures ranging from 20^0C to 40^0C 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^2.

Table 4.27.1: Land use Pattern

Land use	Area in SqKm	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
Total	**2600.00**	

4.27.2 Recorded Forest Area:

The notified forest area of the Division is **1066.46 Km^2** 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.

4.27.3 Protected Area:

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

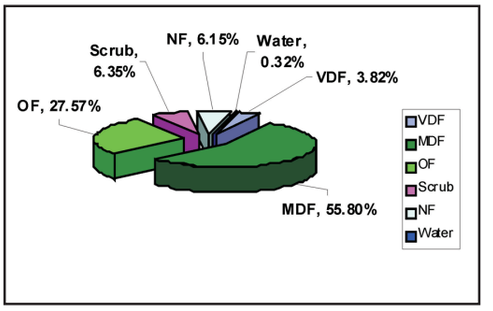
4.27.4 Community Forest Management:

There are 51 Vana Samrakshana Samities (VSSs) or Joint Forest Protection Committees (JFPCs) in the Division. An area of 166.84 Km^2 forests, which is 15.64 % of the notified forests, is under management of the VSSs.

4.27.5 Forest Cover:

The forest cover in the Division based on the interpretation of IRS P6 LISS III 2010 data (Jan-2011) is **929.79 Km^2** which is 35.76 % of the geographical area. In terms of the forest canopy density classes the Division has 40.71 Km^2 of Very Dense Forests, 595.10

Fig.4.27.1



Km^2 of Moderately Dense Forests and 293.98 Km^2 of Open Forests. The area of the Scrub is 67.67 Km^2, Non-Forest 65.57 Km^2 and Water Bodies 3.43 Km^2. The distribution of the forest cover of the Division is shown in Fig 4.27.1

4.27.6 Change in Forest Cover:

The Satellite images of 2009 and 2010 are shown in Figs 4.27.2 & Fig 4.27.3 respectively.

Comparison of the current forest cover with that of previous assessment year shows that there is **no change in the forest cover** during the period .The forest cover change matrix is given in Table 4.27.2.

Fig.4.27.2

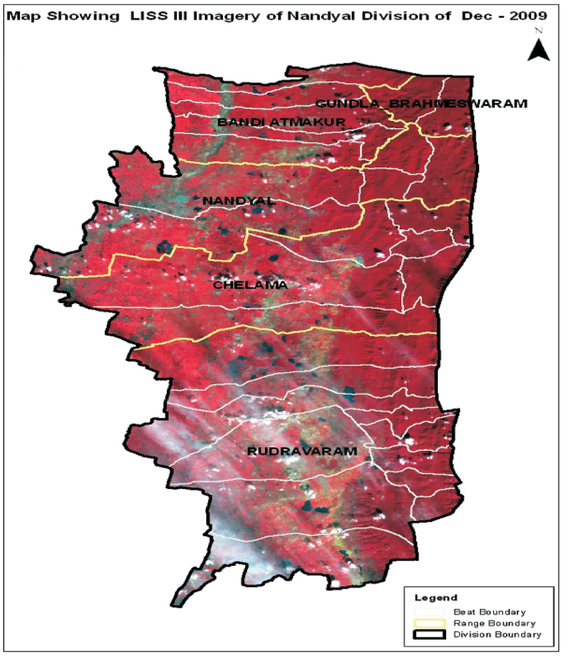
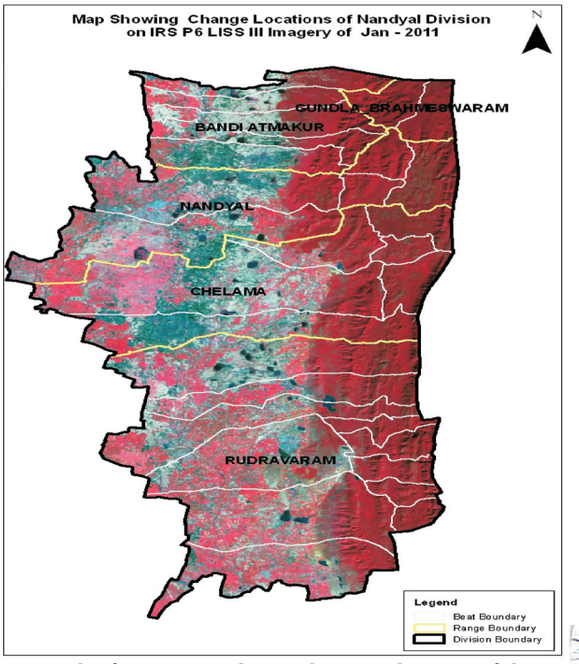


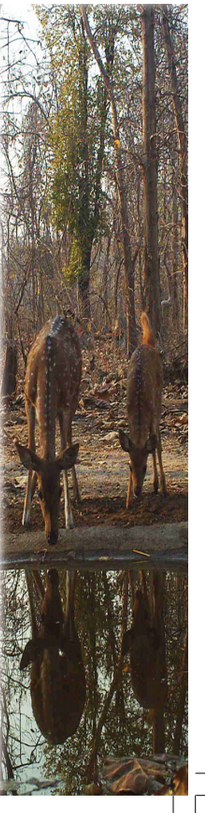
Fig.4.27.3



There are 29 Beats in the Division and there are no changes in the forest cover during the period in any of the 29 Beats.

Table 4.27.2: Forest Cover change matrix (Area in Km^2)

2009	2010						Total of 2009
	VDF	MDF	OF	Scrub	NF	WB	
Very Dense Forest	40.71	0.00	0.00	0.00	0.00	0.00	**40.71**
Moderately Dense Forest	0.00	595.10	0.00	0.00	0.00	0.00	**595.1**
Open Forest	0.00	0.00	293.98	0.00	0.00	0.00	**293.98**
Scrub	0.00	0.00	0.00	67.67	0.00	0.00	**67.67**
Non-Forest	0.00	0.00	0.00	0.00	65.57	0.00	**65.57**
Water	0.00	0.00	0.00	0.00	0.00	3.43	**3.43**
Total of 2010	**40.71**	**595.10**	**293.98**	**67.67**	**65.57**	**3.43**	**1066.46**
Net Change	0.00	0.00	0.00	0.00	0.00	0.00	



Kurnool Circle

4.28 PRODDUTUR DIVISION

4.28.1 Introduction:

Proddutur Forest Division lies in the northern part of Kadapa district between latitudes 14^0 19' 37'' and 15^0 13' 43'' N and longitudes 77^0 56' 43'' and 79^0 17' 38'' E. Geographical area of the Division is 7,524 Km^2 which is 48.99 % of the geographical area of 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 4.28.1

The climate of this Division is generally dry with temperatures ranging from 25^0C to 40^0C 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 limestone.

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^2.

Table 4.28.1: Land use Pattern

Land use	Area in SqKm	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
Total	**7524.00**	

4.28.2 Recorded Forest Area:

The notified forest area of the Division is **1663.35 Km^2** which is 39.13% of the geographical area. Reserved and Protected Forests constitute 1,549.48 Km^2 (93.15%) and 114.07 Km^2 (6.86%) 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 santalanus***), a highly endemic tree species, is found in plenty in this Division.

4.28.3 Protected Area:

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

4.28.4 Community Forest Management:

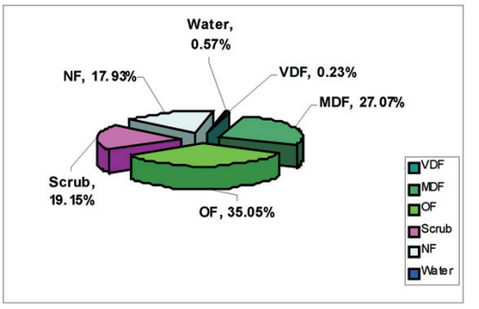
There are 128 Vana Samrakshana Samities (VSSs) in the Division. An area of 456.38 Km^2, which is 28.97% of the notified forest area, is under the management of the VSSs.

4.28.5 Forest Cover:

The forest cover in the Division based on the Interpretation of IRS P6 LISS III 2010 data (Oct 2010) is **982.11 Km^2** which is 13.05% of the geographic area. In terms of the forest canopy density classes the Division has 3.58 Km^2 of Very Dense Forests and 426.38 Km^2 of Moderately Dense Forests and 552.15 Km^2 of Open Forests. The area of the Scrub is

301.70 Km^2, Non-Forest 282.35 Km^2 and Water Bodies 8.95 Km^2. The distribution of the forest cover of the Division is shown in Fig 4.28.1

Fig 4.28.1



4.28.6 Change in Forest Cover:

The satellite images of 2009 and 2010 are shown in Figs 4.28.2 & 4.28.3 respectively and the changes between this period are shown on the image of 2010.

Comparison of the current forest cover with that of the previous assessment year shows **no change** in forest cover. The forest cover change matrix given in table 4.28.2 reveals that there is a decrease of 37.41 Ha in scrub.

This negative change of 37.41 Ha is on account of clearance of scrub growth for raising of plantations. As clearance of scrub growth for raising of plantations is a forest management intervention, the same is not considered as loss of forest Cover. Therefore there is **no net loss of forest cover** in the Division.

Fig 4.28.2

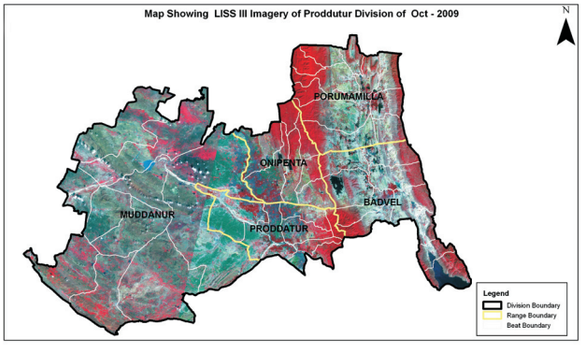
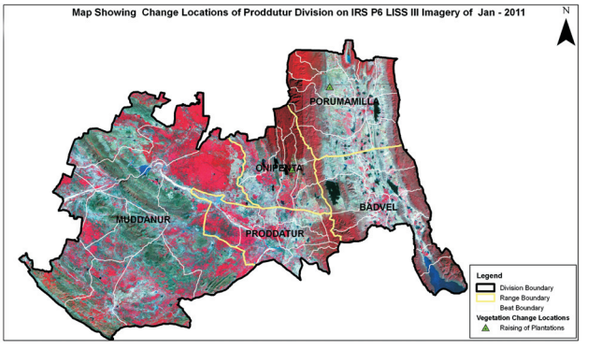


Fig 4.28.3



There are 45 Beats in the Division. Negative changes in forest cover are noticed only in 2 Beats. There are no changes in the remaining 43 Beats.

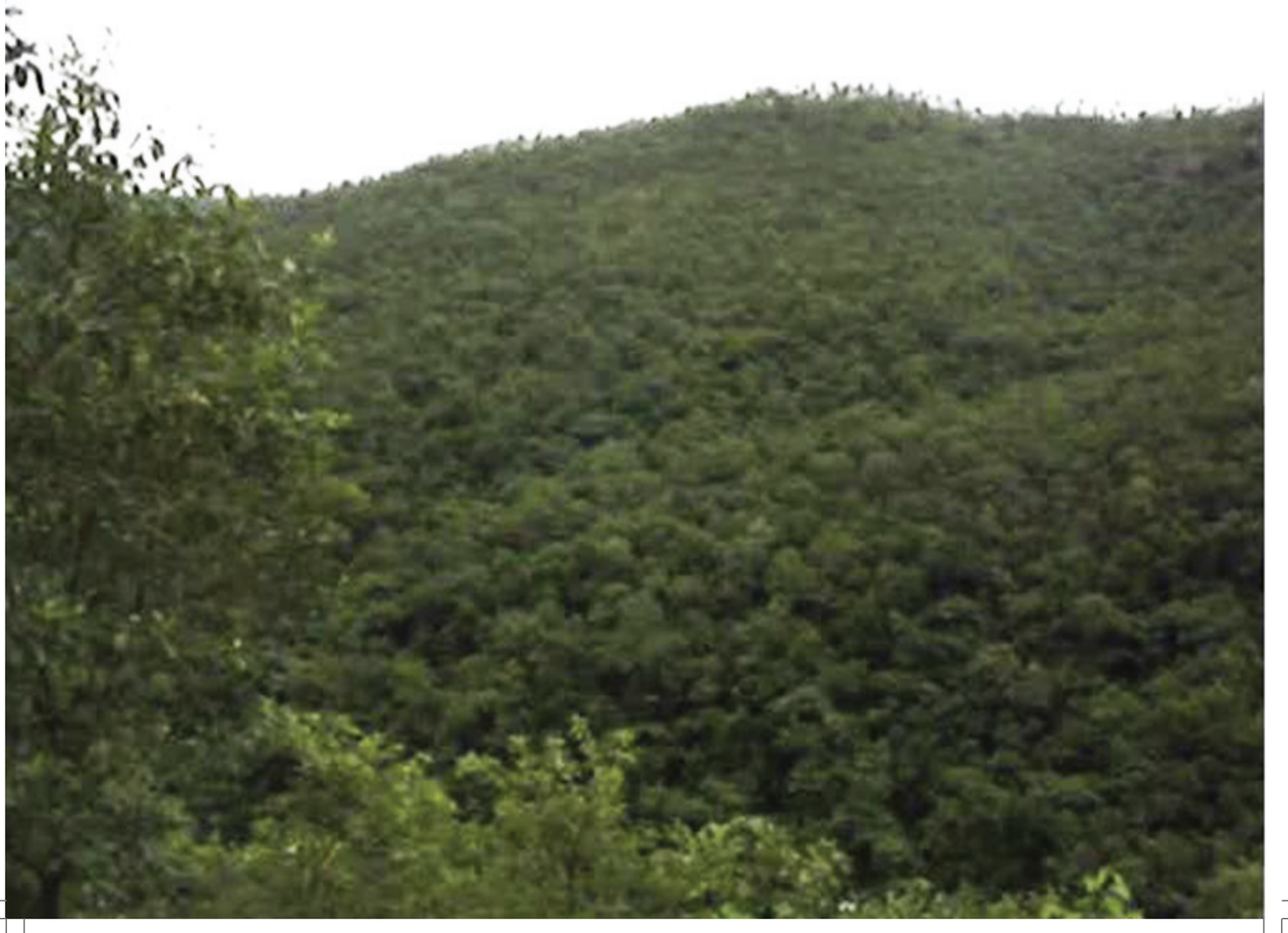
Details of forest cover changes in the above mentioned 2 Beats are shown in Table 4.28.3.

Table 4.28.2: Forest Cover change matrix (Area in Km^2)

2009	2010						Total of 2009
	VDF	MDF	OF	Scrub	NF	WB	
Very Dense Forest	3.58	0.00	0.00	0.00	0.00	0.00	**3.58**
Moderately Dense Forest	0.00	426.38	0.00	0.00	0.00	0.00	**426.38**
Open Forest	0.00	0.00	552.15	0.00	0.00	0.00	**552.15**
Scrub	0.00	0.00	0.00	301.70	0.37	0.00	**302.07**
Non-Forest	0.00	0.00	0.00	0.00	281.98	0.00	**281.98**
Water	0.00	0.00	0.00	0.00	0.00	8.95	**8.95**
Total of 2010	**3.58**	**426.38**	**552.15**	**301.70**	**282.35**	**8.95**	**1575.11**
Net Change	0.00	0.00	0.00	-0.37	0.37	0.00	

Table 4.28.3: List of Beats with negative change in Forest Cover (Area in Ha)

Beat	VDF	MDF	OF	Scrub	NF	WB	Total	Net Change	Encroachments
ONIPENTA RANGE									
Kothapalli	6.06	2195.04	1377.53	209.65	169.26	46.81	4004.35	-34.28	0.00
Total	**6.06**	**2195.04**	**1377.53**	**209.65**	**169.26**	**46.81**	**4004.35**	**-34.28**	**0.00**
PORUMAMILLA RANGE									
Balayapalli	79.83	2396.78	2006	1323.19	656.74	72.67	6535.21	-3.13	0.00
Total	**79.83**	**2396.78**	**2006**	**1323.19**	**656.74**	**72.67**	**6535.21**	**-3.13**	**0.00**
Grand Total	**85.89**	**4591.82**	**3383.53**	**1532.84**	**826.00**	**119.48**	**10539.56**	**-37.41**	**0.00**



4.29 KAMAREDDY DEVISION

4.29.1 Introduction:

Kamareddy Forest Division lies in the south-eastern part of Nizamabad district between latitudes 18^0 3' 34'' and 18^0 42' 11'' N and longitudes 77^0 53' 45'' and 78^0 34' 17'' E. Geographical area of the Division is 2,732 Km^2 which is 34.04% of the geographical area of district. This Division lies on the Deccan plateau. Manjira River flowing from Medak District enters Kamareddy Division at Nizam sagar reservoir and flows in northern direction to join river Godavari at the north-western corner of the district. Kappalavagu and Peddavagu are other two important streams of the Division. The rivers and streams of the district form part of Godavari basin. The altitude varies from 335M to 490M above MSL. The highest peak is 635M above MSL situated in Gandhari block.

Land use pattern of the Division is given in Table 4.29.1

The climate of this Division is generally dry with temperatures ranging from 13^0C to 47^0C. The north and north-western regions of the Division receive above 1000 mm of rainfall while north-eastern, south-eastern and southern regions receive less than 900 mm of rainfall from south-west monsoons.

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

Population of the Division is 1.01 million (2011 Census), per capita forest area is 0.1 Ha and the population density is 371 persons per Km^2.

Table 4.29.1: Land use Pattern

Land use	Area in SqKm	Percentage
Forest including Scrub	903.57	33.01
Agriculture	1613.07	58.94
Land with Scrub	84.61	3.09
Fallow Lands	22.45	0.82
Grasslands	0.00	0.00
Settlements	3.00	0.11
Vegetation outside Forest	32.42	1.18
Water Bodies	77.88	2.85
Total	**2732.00**	

4.29.2 Recorded Forest Area:

The notified forest area of the Division is **940 Km^2** which is 34.40% of the geographical area. Reserved, Protected and Un-classed forests constitute 598.56 Km^2 (63.71%), 252 Km^2 (26.84%) and 88.84 Km^2 (9.45%) of the forest area respectively.

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

4.29.3 Protected Area:

One PA, viz., Pocharam WLS is situated in this Division. An area of 86.76 Km^2 is included in the PA.

4.29.4 Community Forest Management:

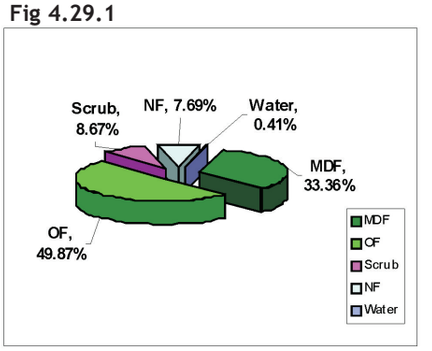
There are 112 Vana Samrakshana Samities (VSSs) in the Division. An area of 325.66 Km^2, which is 33.19% of the notified forest area, is under management of VSSs.

4.29.5 Forest Cover:

The forest cover in the Division based on the interpretation of IRS P6 LISS III 2010 data (Dec 2010) is **816.78 Km^2** which is 29.9% of the geographical area. In terms of the forest canopy density classes the Division has 327.4 Km^2 of Moderately Dense Forests and 489.38 Km^2 of Open Forests. The area of the Scrub is 85.07 Km^2, Non-Forest 75.44 Km^2 and

Water Bodies 4.00 Km^2. The distribution of the forest cover of the Division is shown in Fig 4.29.1

Fig 4.29.1



4.29.6 Change in Forest Cover:

The Satellite images of 2009 and 2010 are shown in Figs 4.29.2 & Fig 4.29.3 respectively and the changes between this period are shown on the image of 2010.

Comparison of the current forest cover with that of previous assessment year shows a **negative change of 34.47 Ha**. The forest cover change matrix given in Table 4.29.2 reveals that there is a decrease of 7.05 Ha of moderately dense forest, 27.42 Ha of open forest.

The entire negative change (including scrub) of 36.7 Ha is on account of encroachments. Therefore the **net loss of forest cover is 36.7 Ha**.

Fig 4.29.2

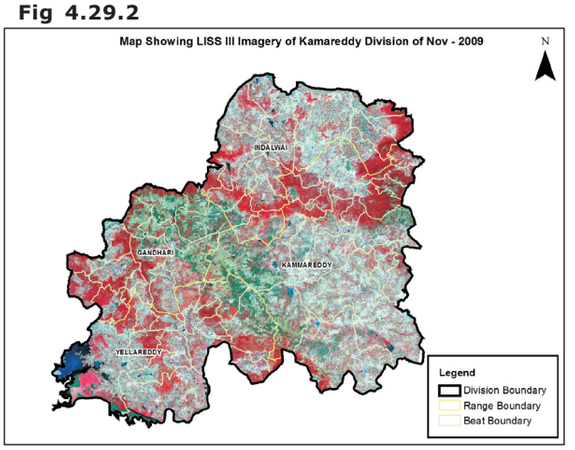
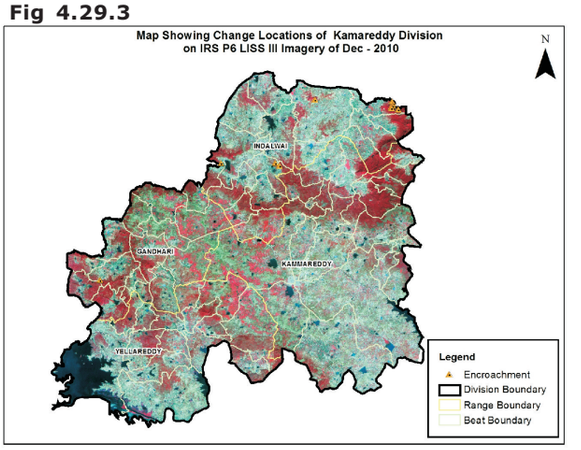


Fig 4.29.3



There are 66 Beats in the Division. Negative changes in forest cover are noticed in 5 Beats. There are no changes in the remaining 61 Beats.

Details of forest cover changes in the above mentioned 5 Beats are shown in Table 4.29.3

Table 4.29.2: Forest Cover change matrix (Area in Km^2)

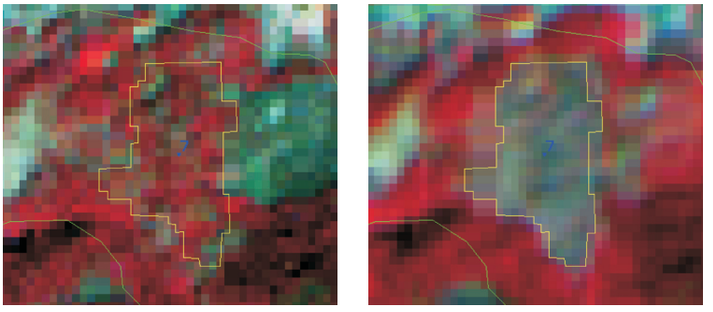
2009	2010						Total of 2009
	VDF	MDF	OF	Scrub	NF	WB	
Very Dense Forest	0.00	0.00	0.00	0.00	0.00	0.00	**0.00**
Moderately Dense Forest	0.00	327.40	0.00	0.07	0.00	0.00	**327.47**
Open Forest	0.00	0.00	489.38	0.19	0.08	0.00	**489.65**
Scrub	0.00	0.00	0.00	84.81	0.02	0.00	**84.83**
Non-Forest	0.00	0.00	0.00	0.00	75.34	0.00	**75.34**
Water	0.00	0.00	0.00	0.00	0.00	4.00	**4.00**
Total of 2010	**0.00**	**327.40**	**489.38**	**85.07**	**75.44**	**4.00**	**981.29**
Net Change	0.00	-0.07	-0.27	0.24	0.10	0.00	

Table 4.29.3: List of Beats with negative change in Forest Cover (Area in Ha)

Beat	VDF	MDF	OF	Scrub	NF	WB	Total	Net Change	Encroachments
GANDHARI RANGE									
Gandivate	0.00	743.87	1547.47	162.36	172.02	22.76	2648.48	-3.76	3.76
Total	**0.00**	**743.87**	**1547.47**	**162.36**	**172.02**	**22.76**	**2648.48**	**-3.76**	**3.76**
INDALWAI RANGE									
Dubbak	0.00	276.29	1124.13	306.66	313.93	4.76	2025.77	-2.23	2.23
Gowraram	0.00	433.97	996.46	100.63	128.41	2.33	1661.80	-6.42	6.42
Indalwai	0.00	871.08	1002.64	113.54	38.05	3.89	2029.20	-1.97	1.97
Pipri	0.00	618.23	116.18	37.61	33.02	0.01	805.05	-22.32	22.32
Total	**0.00**	**2199.57**	**3239.41**	**558.44**	**513.41**	**10.99**	**6521.82**	**-32.94**	**32.94**
Grand Total	**0.00**	**2943.44**	**4786.88**	**720.80**	**685.43**	**33.75**	**9170.30**	**-36.70**	**36.70**

Satellite Images

2009 **2010**



Longitude	78.52527^0 E
Latitude	18.63494^0 N
Area in Ha	15.27
Change	OF to Scrub
Compt No	388
Beat	Pipri
Range	Indalwai
Division	Kamareddy

I do believe that all God's creatures have the right to live as much as we have.

- Harijan of January 1937 CWMG vol 64, 215

Nizamabad Circle

4.30 MEDAK DIVISION

4.30.1 Introduction:

Medak is located in the north-western part of Andhra Pradesh State between latitudes 17^0 25' 36'' and 18^0 17' 7'' N and longitudes 77^0 26' 43'' and 79^0 7' 37'' E. Geographical area of the Division (& District) is 9,699 Km^2. District forms a part of the table land of Deccan plateau and is crisscrossed by different ranges of hills. The ground is mostly flat and undulating with gentle slope. The elevation of ground varies from 500 M to 600M above MSL with occasional hills up to 638M above MSL. Medak falls under semi-arid region of peninsular India.

Land use pattern of the Division is given in Table 4.30.1

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

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

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

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

Table 4.30.1: Land use Pattern

Land use	Area in SqKm	Percentage
Forest including Scrub	923.13	9.52
Agriculture	7591.99	78.28
Land with Scrub	561.88	5.79
Fallow Lands	11.42	0.12
Settlements	50.71	0.52
Vegetation outside Forest	293.88	3.03
Water Bodies	265.99	2.74
Total	**9699.00**	

4.30.2 Recorded Forest Area:

The notified forest area of the Division is **905.94 Km^2** which is 9.96% of the geographical area. Reserved, Protected and Un-classed forests constitute 634.22 Km^2 (70%), 255.63 Km^2 (28.2%) and 16.09 Km^2 (0.018%) of the forest area respectively.

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

4.30.3 Protected Area:

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

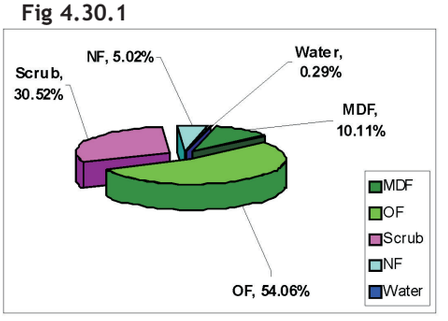
4.30.4 Community Forest Management:

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

4.30.5 Forest Cover:

The forest cover in the Division based on the interpretation of IRS P6 LISS III 2010 data (Dec 2010) is **588.15 km^2** which is 6.06% of the geographical area. In terms of the forest canopy density classes the Division has 92.653 Km^2 of Moderately Dense Forests and 495.50 Km^2 of Open Forests. The area of the Scrub is 279.77 Km^2, Non-Forests 45.98 Km^2 and Water Bodies 2.68 Km^2. The distribution of the forest cover of the division is shown in Fig 4.30.1

Fig 4.30.1



4.30.6 Change in Forest Cover:

The Satellite image of 2009 and 2010 are shown in Figs 4.30.2 & 4.30.3 respectively and the changes between this period are shown on the image of 2010.

Comparison of the current forest cover with that of previous assessment year shows a **negative change of 179.11 Ha** and **positive change of 2.94 Ha**. The forest cover change matrix given in Table 4.30.2 reveals that there is an increase of 0.32 Ha in Moderately dense forest and a decrease of 176.49 Ha in open forest.

Out of the total negative change (including scrub) of 320.54 Ha, a change of 25.23 Ha is on account of clearance of jungle growth for raising of plantations, 203.55 Ha on account of harvesting of matured plantation, 1.29 Ha is on account of diversion of forest land for non-forestry purposes and 90.47 Ha on account of encroachments. As harvesting of plantations and clearance of jungle growth for raising of plantations and diversion of forestlands are forest management interventions the same are not considered as loss of forest cover. Thus only the negative change due to encroachment is taken as loss of forest cover. Therefore the **net loss of forest cover** is **90.47 Ha** only.

Fig 4.30.2

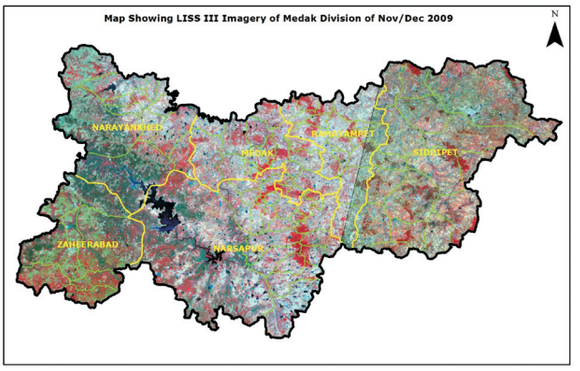
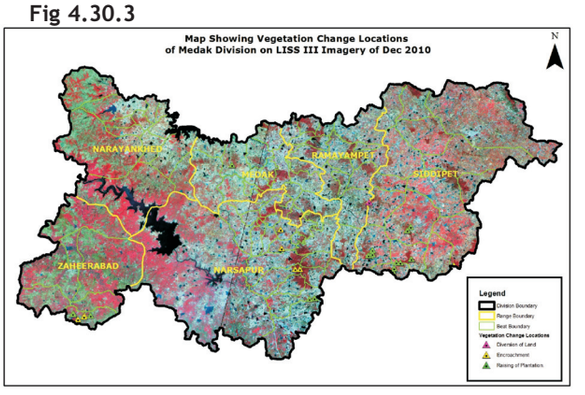


Fig 4.30.3



There are 92 Beats in the Division. Negative changes in forest cover are noticed in 12 Beats. There are no changes in remaining 80 Beats.

Details of forest cover changes in the 12 Beats mentioned above are shown in Table 4.30.3

Table 4.30.2: Forest Cover change matrix (Area in Km²)

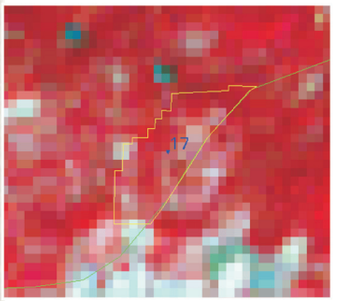
2009	2010						Total of 2009
	VDF	MDF	OF	Scrub	NF	WB	
Very Dense Forest	0.00	0.00	0.00	0.00	0.00	0.00	**0.00**
Moderately Dense Forest	0.00	92.624	0.00	0.00	0.026	0.00	**92.65**
Open Forest	0.00	0.000	495.50	0.22	1.54	0.00	**497.26**
Scrub	0.00	0.000	0.00	279.55	1.38	0.00	**280.93**
Non-Forest	0.00	0.029	0.00	0.00	43.03	0.00	**43.06**
Water	0.00	0.00	0.00	0.00	0.00	2.68	**2.68**
Total of 2010	**0.00**	**92.653**	**495.50**	**279.77**	**45.98**	**2.68**	**916.58**
Net Change	0.00	0.003	-1.76	-1.16	2.92	0.00	

Table 4.30.3: List of Beats with negative change in Forest Cover (Area in Ha)

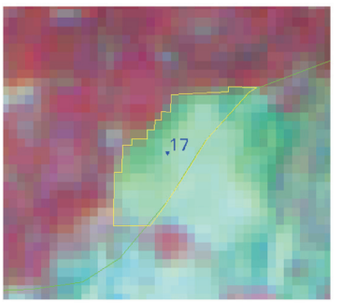
Beat	VDF	MDF	OF	Scrub	NF	WB	Total	Net Change	Encroachments
MEDAK RANGE									
Annaram	0.00	118.36	815.57	257.74	27.87	2.00	1,221.54	-4.85	0.00
Total	**0.00**	**118.36**	**815.57**	**257.74**	**27.87**	**2.00**	**1221.54**	**-4.85**	**0.00**
NARSAPUR RANGE									
Narayanapoor	0.00	3.1	292.02	266.93	15.91	0.00	577.96	-18.12	18.12
Nathinaipally	0.00	10.64	332.94	375.39	85.57	0.00	804.54	-11.37	11.37
Tirumalpur	0.00	0.5	349.77	433.44	26.42	0.00	810.13	-20.84	20.84
Wailal	0.00	74.25	518.24	294.28	76.21	0.00	962.98	-23.21	0.00
Total	**0.00**	**88.49**	**1492.97**	**1370.04**	**204.11**	**0.00**	**3155.61**	**-73.54**	**50.33**
SIDDIPET RANGE									
Chilasagar	0.00	9.4	348.25	470.00	7.93	11.9	847.48	-50.89	0.00
Gajwel	0.00	1.79	774.32	668.18	26.41	9.40	1,480.10	-49.93	0.00
Induprial	0.00	1.79	801.85	1,158.66	86.37	13.58	2,062.25	-1.29	0.00
Jagdevpur	0.00	0.00	780.99	360.71	9.27	1.00	1,151.97	-3.92	3.92
Meenajipet	0.00	1.79	880.97	1,053.20	55.00	0.36	1,991.32	-59.68	0.00
Mulugu	0.00	24.22	882.02	541.62	96.13	4.70	1,548.69	-21.86	0.00
Total	**0.00**	**38.99**	**4468.4**	**4252.37**	**281.11**	**40.94**	**9081.81**	**-187.57**	**3.92**
ZAHEERABAD RANGE									
Gudgarpally	0.00	398.05	705.63	223.81	58.05	24.32	1,409.86	-48.70	36.22
Total	**0.00**	**398.05**	**705.63**	**223.81**	**58.05**	**24.32**	**1409.86**	**-48.70**	**36.22**
Grand Total	**0.00**	**643.89**	**7482.57**	**6103.96**	**571.14**	**67.26**	**14868.8**	**-314.66**	**90.47**

Satellite Images

2009



2010



Longitude	78.30486^0 E
Latitude	17.69529^0 N
Area in Ha	6.71
Change	OF to NF
Compt No	332
Beat	Nathinaipally
Range	Narsapur
Division	Medak

Control and eradicate non-native or genetically modified organisms harmful to native species and the environment and prevent introduction of such harmful organisms. - *Earth charter & Gandhi page 59*

4.31 MEDAK WLM DIVISION

4.31.1 Introduction:

WLM Division Medak is located in the north-western part of Andhra Pradesh State between latitudes 18^0 6' 59'' and 18^0 12' 55'' N and longitudes 78^0 10' 10'' and 78^0 22' 4'' E. Geographical Area of the Division is 90.70 Km^2. The ground is mostly flat and undulating with gentle slope. The elevation of ground varies from 500M to 600M with occasional hills up to 638 M above MSL. Medak falls under semi-arid region of peninsular India.

Land use pattern of the Division is given in Table 4.31.1

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

Table 4.31.1: Land use Pattern

Land use	Area inSqKm	Percentage
Forest including Scrub	45.82	50.52
Agriculture	26.68	29.41
Land with Scrub	5.90	6.50
Settlements	0.29	0.32
Not available for cultivation	11.77	12.98
Water Bodies	0.24	0.26
Total	**90.70**	

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

4.31.2 Recorded Forest Area:

The notified forest area of the Division is **46.71 Km^2** which is 51.51% of the geographical area. Reserved and Protected forests constitute 4.605 Km^2 (9.86%) and 42.107 Km^2 (90.15%) of the forest area respectively.

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

4.31.3 Protected Area:

Out of 46.71 Km^2 of notified forests an area of 42.11 Km^2 is included in Pocharam WLS, which constitutes 90.15% of notified forests.

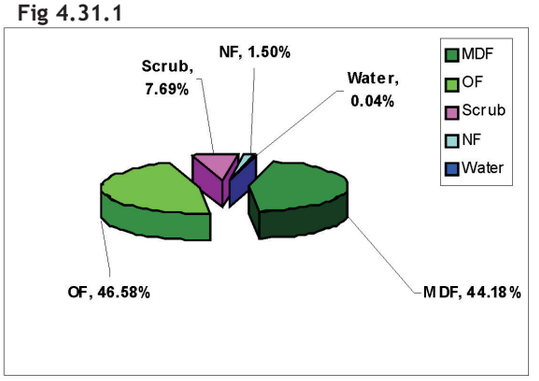
4.31.4 Community Forest Management:

There are 11 Vana Samrakshana Samities (VSSs) in the Division. An area of 21.50 Km^2 forests, which is 46.02% of notified forest area, is under the management of VSSs.

4.31.5 Forest Cover:

The forest cover in the Division based on the interpretation of IRS P6 LISS III 2010 data (Dec 2010) is **42.24 km^2** which is 46.57% of the geographical area. In terms of the forest canopy density classes the Division has 20.56 Km^2 of Moderately Dense Forests and 21.68 Km^2 of Open Forests. The area of the Scrub is 3.58 Km^2, Non-Forests 0.70 Km^2 and Water Bodies 0.02 Km^2. The distribution of the forest cover of the Division is shown in Fig 4.31.1

Fig 4.31.1



4.31.6 Change in Forest Cover:

The Satellite images of 2009 and 2010 are shown in Figs 4.31.2 & 4.31.3 respectively. Comparison of the current forest cover with that of previous assessment year shows that there is **no change** in the forest cover during this period. The forest cover change matrix is given in Table 4.31.2.

Fig 4.31.2

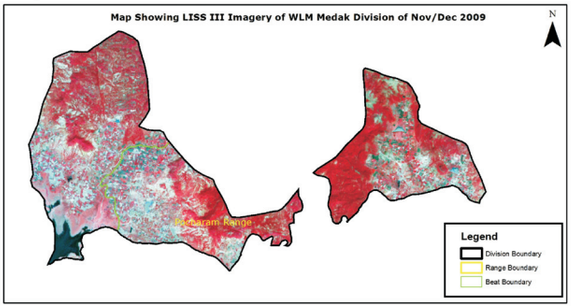
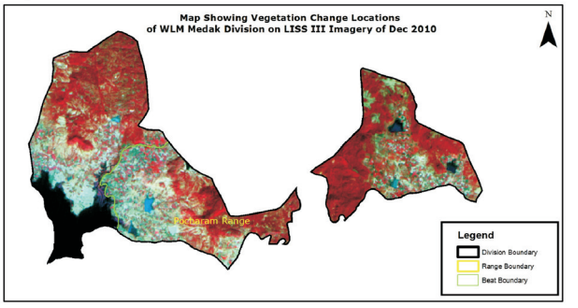


Fig 4.31.3



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

Table 4.31.2: Forest Cover change matrix (Area in Km^2)

2009	2010						Total of 2009
	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	20.56	0.00	0.00	0.00	0.00	**20.56**
Open Forest	0.00	0.00	21.68	0.00	0.00	0.00	**21.68**
Scrub	0.00	0.00	0.00	3.58	0.00	0.00	**3.58**
Non-Forest	0.00	0.00	0.00	0.00	0.70	0.00	**0.70**
Water	0.00	0.00	0.00	0.00	0.00	0.02	**0.02**
Total of 2010	**0.00**	**20.56**	**21.68**	**3.58**	**0.70**	**0.02**	**46.54**
Net Change	0.00	0.00	0.00	0.00	0.00	0.00	0.00

We should feel a more living bond between ourselves and the rest of the animate world.

- (CWMG vol 42, 238)

4.32 NIZAMABAD DIVISION

4.32.1 Introduction:

Nizamabad Forest Division lies in the north-western part of Nizamabad district between latitudes 18^0 10' 10'' and 19^0 00' 55'' N and longitudes 77^0 31' 17'' and 78^0 40' 17'' E. Geographical Area of the Division is 5,219 Km^2 which is 65.59 % of the area of district. This region lies on deccan plateau. Godavari river enters Andhra Pradesh at Kandhakurthi in Nizamabad Division. Manjira River, which flows in north-west direction through thick forests of Nizamabad and Kamareddy Divisions, joins Godavari at Kandhakurthi.

Land use pattern of the Division is given in Table 4.32.1

The climate of this Division is generally dry with temperatures ranging from 13^0C to 47^0C and the annual rainfall is about 1033.7mm, received mainly from south-west monsoons.

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

Population of the Division is 1.54 million (2011 Census), per capita forest area is 0.05 Ha and the population density is 294 persons per Km^2.

Table 4.32.1: Land use Pattern

Land use	Area in SqKm	Percentage
Forest including Scrub	705.71	13.52
Agriculture	3809.14	72.99
Land with Scrub	192.54	3.69
Fallow Lands	31.84	0.61
Grasslands	0.00	0.00
Settlements	31.74	0.61
Vegetation outside Forest	45.00	0.86
Water Bodies	402.76	7.72
Total	**5219.00**	

4.32.2 Recorded Forest Area:

The notified forest area of the Division is **872 Km^2** which is 16.7% of the geographical area. Reserved, Protected and Un-classed forests constitute 530.36 Km^2 (60.84%), 319 Km^2 (36.61%) and 22.26 Km^2 (2.5%) of the forest area respectively.

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

4.32.3 Protected Area:

There is no Protected Area in the Division.

4.32.4 Community Forest Management:

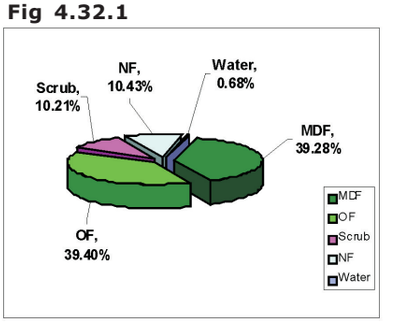
There are 148 Vana Samrakshana Samities (VSSs) in the Division. An area of 423.48Km^2 forests, which is 48.56% of forest area, is under the management of VSSs.

4.32.5 Forest Cover:

The forest cover in the Division based on the interpretation of IRS P6 LISS III 2010 data (Dec 2010) is **619.32 Km^2** which is 11.87% of the geographical area. In terms of the forest canopy density classes the Division has 309.20 Km^2 of Moderately Dense Forests and 310.12 Km^2 of Open Forests. The area of the Scrub is 80.37 Km^2, Non-forests 82.12 Km^2

and Water Bodies 5.32 Km^2. The distribution of the forest cover of the Division is shown in Fig 4.32.1.

Fig 4.32.1



4.32.6 Change in Forest Cover:

The Satellite images of 2009 and 2010 are shown in Figs. 4.32.2 & Fig 4.32.3 respectively and the changes between this period are shown on the image of 2010.

Comparison of the current forest cover with that of previous assessment year shows a **negative change in forest cover of 113.05 Ha**. The forest cover change matrix given in Table 4.32.2 reveals that there is a decrease of 60.33 Ha of moderately dense forest, 52.72 Ha of open forest.

The entire negative change (including scrub) of 119.17 Ha, is on account of encroachments, which is a loss of forest cover. Therefore, the **net loss of forest cover** in this Division is **119.17 Ha**.

Fig 4.32.2

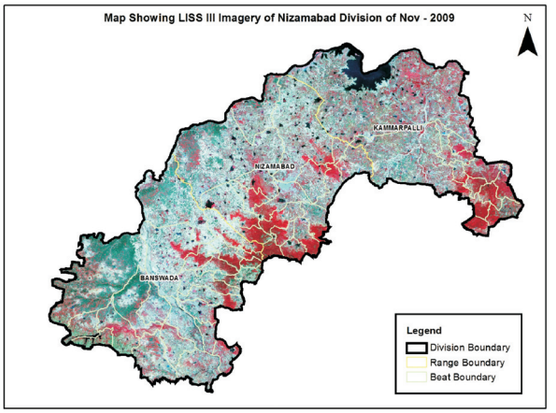
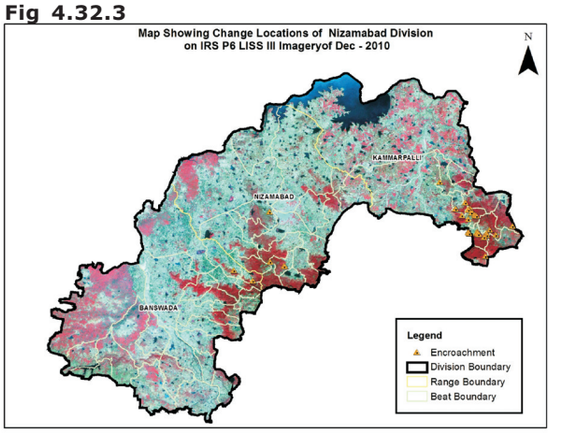


Fig 4.32.3



There are 55 Beats in the Division. Negative changes in forest cover are noticed in 13 Beats. There are no changes in the remaining 42 Beats.

Details of forest cover changes in these 13 Beats are shown in Table 4.32.3

Table 4.32.2: Forest Cover change matrix (Area in Km^2)

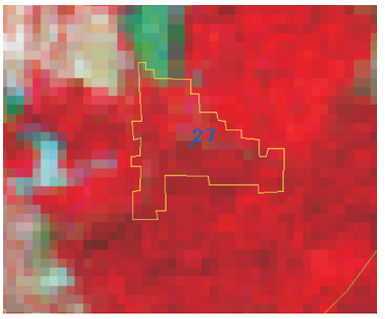
2009	2010						Total of 2009
	VDF	MDF	OF	Scrub	NF	WB	
Very Dense Forest	0.00	0.00	0.00	0.00	0.00	0.00	**0.00**
Moderately Dense Forest	0.00	309.20	0.00	0.32	0.28	0.00	**309.80**
Open Forest	0.00	0.00	310.12	0.09	0.44	0.00	**310.65**
Scrub	0.00	0.00	0.00	79.96	0.06	0.00	**80.02**
Non-Forest	0.00	0.00	0.00	0.00	81.34	0.00	**81.34**
Water	0.00	0.00	0.00	0.00	0.00	5.32	**5.32**
Total of 2010	**0.00**	**309.20**	**310.12**	**80.37**	**82.12**	**5.32**	**787.13**
Net Change	0.00	-0.60	-0.53	0.35	0.78	0.00	

Table 4.32.3: List of Beats with negative change in Forest Cover (Area in Ha)

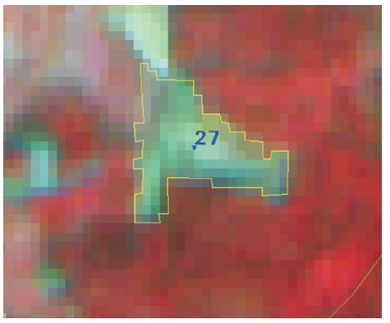
Beat	VDF	MDF	OF	Scrub	NF	WB	Total	Net Change	Encroachments
BANSWADA RANGE									
Chandur	0.00	294.24	478.27	103.90	153.14	0.01	1029.56	-7.67	7.67
Medpally(n)	0.00	544.02	231.66	61.09	57.76	0.70	895.23	-2.31	2.31
Total	**0.00**	**838.26**	**709.93**	**164.99**	**210.90**	**0.71**	**1924.79**	**-9.98**	**9.98**
KAMMARPALLI RANGE									
Bheemgal	0.00	962.16	864.44	328.60	238.94	13.67	2407.81	-1.47	1.47
Bheemnagar	0.00	1363.60	490.97	101.42	205.03	20.92	2181.94	-11.15	11.15
Karepally	0.00	991.43	369.00	121.59	113.06	7.62	1602.70	-28.68	28.68
Konapur (n)	0.00	1452.88	1339.56	70.17	39.28	34.07	2935.96	-4.52	4.52
Konapur (s)	0.00	1202.23	1031.82	83.49	109.34	9.39	2436.27	-3.76	3.76
Konasamundar	0.00	506.27	609.42	193.98	119.18	56.46	1485.31	-4.33	4.33
Mendora	0.00	418.99	229.55	61.50	102.50	-0.01	812.53	-3.07	3.07
Tadlapally	0.00	1332.13	408.43	92.03	195.80	-0.01	2028.38	-37.82	37.82
Tatpally	0.00	1455.64	632.93	106.01	33.89	0.00	2228.47	-1.40	1.40
Total	**0.00**	**9685.33**	**5976.12**	**1158.79**	**1157.02**	**142.11**	**18119.37**	**-96.20**	**96.20**
NIZAMABAD RANGE									
Mudakpally	0.00	780.54	487.16	34.77	48.32	0.00	1350.79	-11.20	11.20
Thanakalan	0.00	316.35	1194.53	340.15	125.30	30.04	2006.37	-1.79	1.79
Total	**0.00**	**1096.89**	**1681.69**	**374.92**	**173.62**	**30.04**	**3357.16**	**-12.99**	**12.99**
Grand Total	**0.00**	**11620.48**	**8367.74**	**1698.70**	**1541.54**	**172.86**	**23401.32**	**-119.17**	**119.17**

Satellite Images

2009



2010



Longitude	78.58578^0 E
Latitude	18.62296^0 N
Area in Ha	8.34
Change	MDF to NF
Compt No	47
Beat	Tadlapally
Range	Kammarpalli
Division	Nizamabad

Rajahmundry Circle

4.33 ELURU DIVISION

4.33.1 Introduction:

Eluru Forest Division lies in the north-eastern part of Andhra Pradesh between latitude16^0 18' 05'' and 17^0 28' 52''N and longitude 80^0 52' 04''and 81^0 51' 31''. Geographical area of the Division (and the District) is 7742 km^2. The Division has two physiographic zones, the Plains and 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 4.33.1

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^{0}C to 45^{0}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 is 0.02 Ha and the population density is 508 per Km^2.

Table 4.33.1: Land use Pattern

Land use	Area in SqKm	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
Total	**7742.00**	

4.33.2 Recorded Forest Area:

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

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

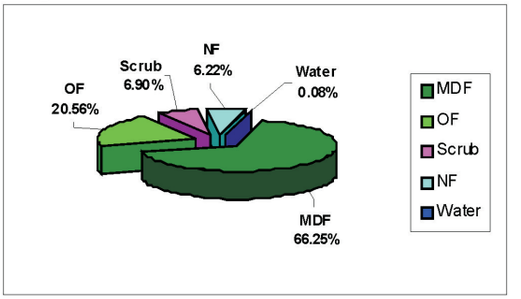
4.33.3 Protected Area:

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

4.33.4 Community Forest Management:

There are 213 VSSs in the Division. An area of 414.54 Km^2 of forests, which constitutes 53% of forest area, is under the management of VSSs.

Fig 4. 33.1



4.33.5 Forest Cover:

The forest cover in the Division based on the interpretation of IRS P6 LISS III 2010 data (Dec 2010 - Jan 2011) is **668.70 Km^2** which is 8.6% of the geographical area. In terms of the forest canopy

cover density classes the Division has 512.15 Km^2 of Moderately Dense Forests and 156.55 Km^2 of Open Forests. The area of the Scrub is 53.41 Km^2, Non-Forest 50.32 Km^2 and Water Bodies 0.59 Km^2. The distribution of the forest cover of the Division is shown in Fig 4.33.1.

4.33.6 Change in Forest Cover:

The satellite images of 2009 and 2010 are shown in Figs 4.33.2 & 4.33.3 respectively and the changes between this period are shown on the image of 2010.

Comparison of the current forest cover with that of previous assessment year shows a **negative change of 535.2 Ha** and **positive change of 298.79 Ha**. The forest cover change matrix given in Table 4.33.2 reveals that there is a decrease of 236.41 Ha in open forest.

The positive change (including scrub) of 298.79 Ha is on account of growth in raised plantations. The negative change (including scrub) of 338.57 Ha is on account of clearance of jungle growth for raising of plantations, 16.25 Ha is on account of harvesting of matured plantations and 180.38 Ha is on account of encroachments. As harvesting of plantations and clearance of jungle growth for raising of plantations are forest management interventions and hence cannot be considered as loss of forest cover. Hence the negative change due to encroachment alone is taken as negative change. Therefore the **net loss of forest cover is 180.38 Ha**.

There are 43 Beats in the Division. Negative changes in forest cover are seen in 10 Beats and positive change in 5 Beats. Both positive and negative changes are seen in 4 Beats. There is no change in the remaining 27 Beats.

Details of forest cover changes in these 11 Beats is shown in Table 4.33.3.

Fig 4. 33.2

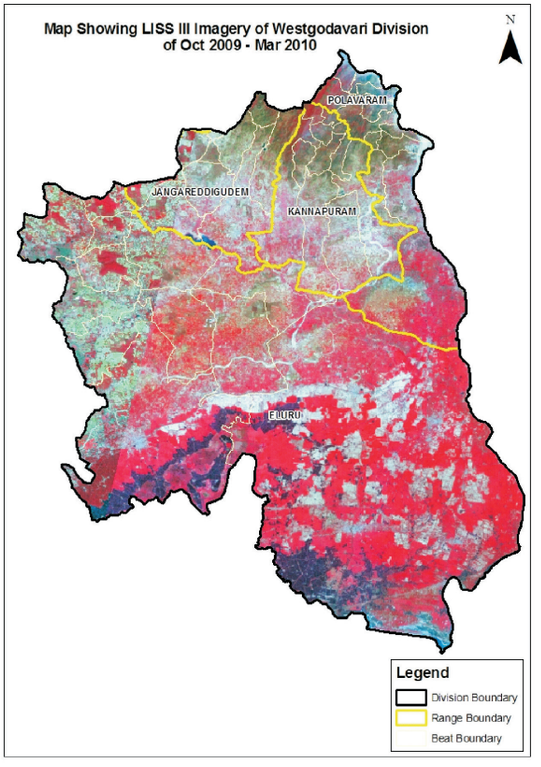
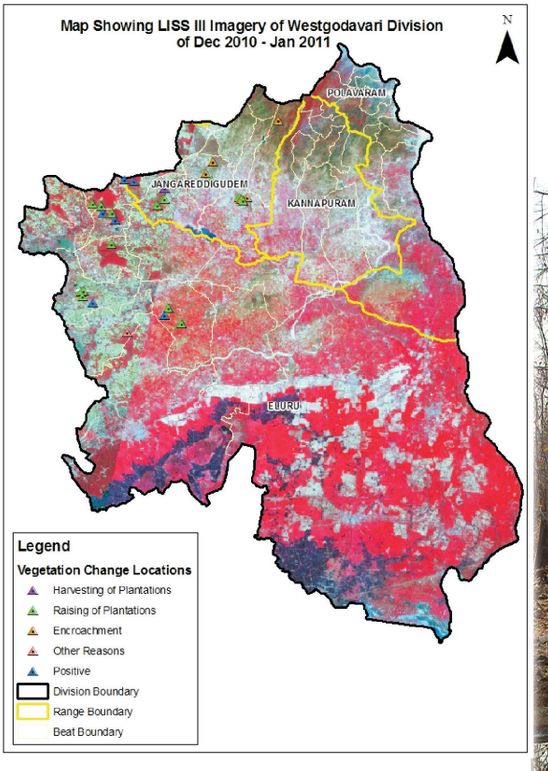


Fig 4. 33.3



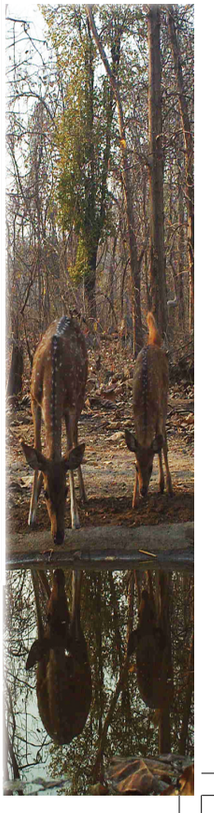
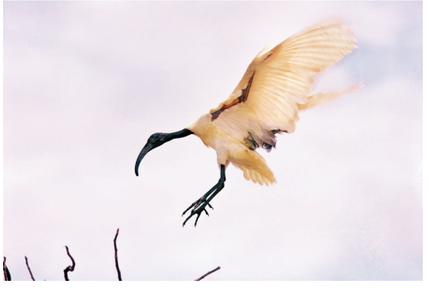


Table 4.33.2: Forest Cover change matrix (Area in Km²)

2009	2010						Total of 2009
	VDF	MDF	OF	Scrub	NF	WB	
Very Dense Forest	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Moderately Dense Forest	0.00	512.15	0.00	0.00	0.00	0.00	512.15
Open Forest	0.00	0.00	153.56	0.62	4.73	0.00	158.91
Scrub	0.00	0.00	0.53	52.79	0.00	0.00	53.32
Non-Forest	0.00	0.00	2.46	0.00	45.59	0.00	48.05
Water	0.00	0.00	0.00	0.00	0.00	0.59	0.59
Total of 2010	**0.00**	**512.15**	**156.55**	**53.41**	**50.32**	**0.59**	**773.02**
Net Change	0.00	0.00	-2.36	0.09	2.27	0.00	

Table 4.33.3: List of Beats with negative change in Forest Cover (Area in Ha)

Beat	VDF	MDF	OF	Scrub	NF	WB	Total	Net Change	Encroachments
ELURU RANGE									
Bhogole	0.00	332.9	570.96	516.63	214.68	0.00	1635.17	-35.83	35.83
Chintalapudi	0.00	1374.72	773.87	61.90	85.98	0.00	2296.47	-32.31	0.00
M.V.Gudem	0.00	1116.05	777.60	343.17	269.83	0.00	2506.65	-98.78	0.00
Thadikelapudi	0.00	47.31	857.96	388.24	238.40	0.00	1531.91	45.78	0.00
Velagalapalli	0.00	38.12	550.11	319.26	1099.91	3.36	2010.76	-76.38	0.00
Yerraguntapalli	0.00	376.48	559.55	95.16	209.75	0.00	1240.94	129.17	0.00
Total	**0.00**	**3285.58**	**4090.05**	**1724.36**	**2118.55**	**3.36**	**11221.9**	**-68.35**	**35.83**
JANGAREDDIGUDEM RANGE									
Darbhagudem	0.00	12.85	703.62	409.74	202.42	0.00	1328.63	-30.58	0.00
Gullapudi	0.00	3918.14	262.00	5.20	10.28	2.37	4197.99	-0.75	0.75
Jeelugumilli	0.00	256.18	806.85	387.05	56.96	0.00	1507.04	34.26	0.00
Marlagudem	0.00	122.90	487.54	25.93	187.95	0.00	824.32	-64.81	52.47
Mulagalampalli	0.00	577.34	773.31	420.25	756.14	0.00	2527.04	-106.18	91.33
Total	**0.00**	**4887.41**	**3033.32**	**1248.17**	**1213.75**	**2.37**	**10385**	**-168.06**	**144.55**
Grand Total	**0.00**	**8172.99**	**7123.37**	**2972.53**	**3332.3**	**5.73**	**21606.9**	**-236.41**	**180.38**



Adopt at all levels sustainable development plans and regulations that make environmental conservation and rehabilitation integral to all development initiatives. - Earth charter & Gandhi page 21

4.34 KAKINADA DIVISION

4.34.1 Introduction:

Kakinada Forest Division comprises of the entire district of East Godavari and lies in the north eastern part of Andhra Pradesh between latitudes16^0 18' 04'' and 18^0 00' 54''N and longitude 81^0 30' 08'' and 82^0 36' 17'' E. Geographical area of the Division is 10807 Km^2. 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 4.34.1.

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. Temperatures ranging from 10^{0}C to 48^{0}C and the annual rainfall are 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^2.

Table 4.34.1: Land use Pattern

Land use	Area in SqKm	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
Total	**10807.00**	

4.34.2 Recorded Forest Area:

The notified forest area of the Division is **3235.39 Km^2** which is 32.71% of the geographical area. Reserved and Protected Forests constitute 2701.31Km^2 (83.3%) and 531.13 Km^2 (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.

4.34.3 Protected Area:

The Division has Coringa Wildlife 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 Wildlife Sanctuary in its fold.Out of the 3235.39 Km^2 of forest area the Coringa WLS occupies an area of 235.7 Km^2 of area and Papikonda WLS 591 Km^2.

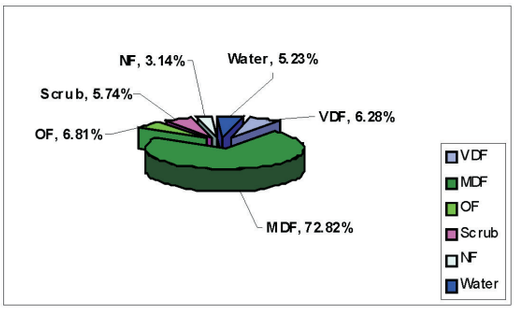
4.34.4 Community Forest Management:

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

4.34.5 Forest Cover:

The forest cover in the Division based on the interpretation of IRS P6 LISS III 2010 data (Data of Jan 2011) is **2778.66 Km²** which is 25.71% of the geographical area. In terms of the forest canopy density classes the Division has 203.04 Km² of Very Dense Forests, 2355.89 Km² of Moderately Dense forests and 220.21 Km² of Open Forests. The area of the Scrub is 185.66 Km²,that of Non-Forest 101.53 Km² and Water Bodies 169.06 Km². The distribution of the forest cover of the Division is shown in Fig 4.34.1.

Fig 4.34.1



4.34.6 Change in Forest Cover:

The satellite images of 2009 and 2010 seasons are shown in Fig 4.34.2 and Fig 4.34.3 respectively and the changes between this period are shown on the image of 2010.

Comparison of the current forest cover with that of previous assessment year shows a **negative change** in forest cover of **96.68 Ha** and a **positive change of 24.34 Ha**. The forest cover change matrix given in Table 4.34.2 reveals that there is a decrease of 7.26 Ha of Moderately dense forest, 58.50 Ha of Open forest and 30.92 Ha of scrub.

The positive change of 24.34 Ha is on account of growth in plantations raised. The negative change (including Scrub) of 60.94 Ha is on account of clearance of growth for raising of plantations and 35.74 Ha 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 is taken as loss of forest cover. Therefore the **net loss of forest cover is 35.74 Ha**.

Fig 4.34.2

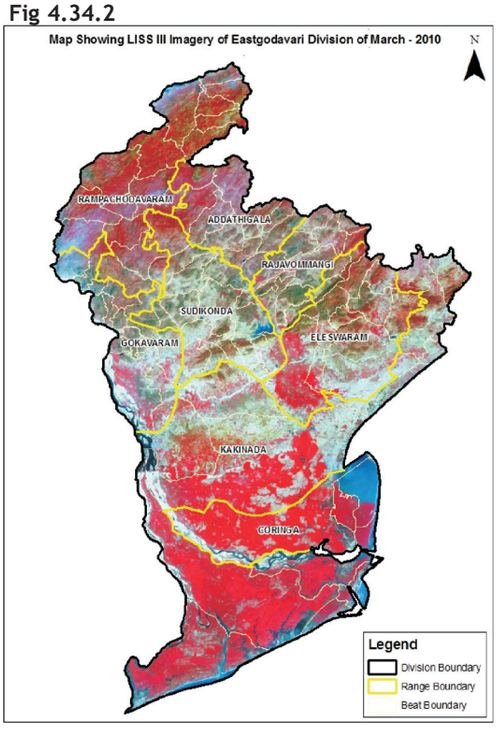
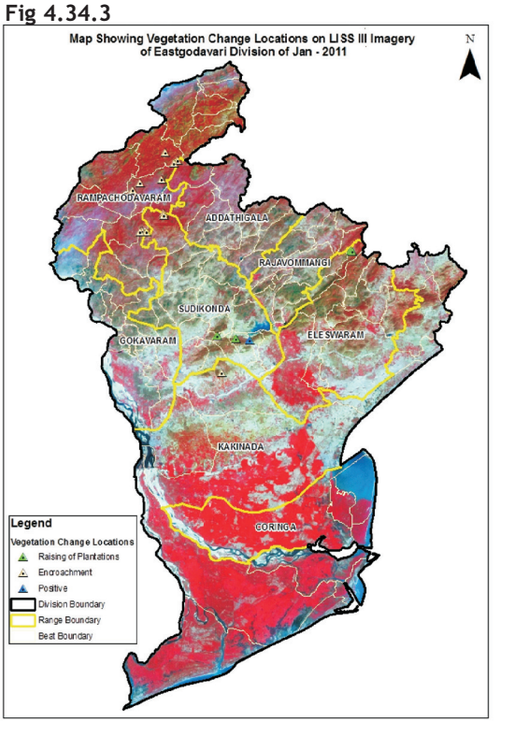


Fig 4.34.3



There are 99 Beats in the Division. Negative changes in forest cover are seen in 9 Beats and there are no changes in the remaining 90 Beats.

Details of forest cover changes in the 9 Beats mentioned above are shown in Table 4.34.3.

Table 4.34.2: Forest Cover change matrix (Area in Km²)

2009	2010						Total of 2009
	VDF	MDF	OF	Scrub	NF	WB	
Very Dense Forest	203.04	0.00	0.00	0.00	0.00	0.00	**203.04**
Moderately Dense Forest	0.00	2355.98	0.00	0.00	0.07	0.00	**2356.05**
Open Forest	0.00	0.00	219.89	0.00	0.82	0.00	**220.71**
Scrub	0.00	0.00	0.24	185.66	0.07	0.00	**185.97**
Non-Forest	0.00	0.00	0.00	0.00	100.56	0.00	**100.56**
Water	0.00	0.00	0.00	0.00	0.00	169.06	**169.06**
Total of 2010	**203.04**	**2355.98**	**220.13**	**185.66**	**101.52**	**169.06**	**3235.39**
Net Change	0.00	-0.07	-0.58	-0.31	0.96	0.00	

Table 4.34.3: List of Beats with negative change in Forest Cover (Area in Ha)

Beat	VDF	MDF	OF	Scrub	NF	WB	Total	Net Change	Encroachments
ADDATHIGALA RANGE									
Perikivalasa	1254.3	4431.62	256.85	442.03	695.73	0.00	7080.53	-2.21	2.21
Total	**3683.26**	**31412.8**	**2119.23**	**2134.68**	**1291.31**	**33.73**	**40675.01**	**-2.21**	**2.21**
ELESWARAM RANGE									
Lododdi	72.57	1964.59	149.79	126.31	69.11	0.00	2382.37	-9.75	0.00
Total	**608.12**	**24579.3**	**2739.72**	**1937.11**	**576.06**	**39.51**	**30479.79**	**-9.75**	**0.00**
KAKINADA RANGE									
Murari	24.25	525.24	6.11	9.15	42.23	0.00	606.98	-8.43	8.43
Total	**1198.48**	**9503.97**	**1600.66**	**1115.64**	**1373.21**	**1390.8**	**16182.76**	**-8.43**	**8.43**
RAMPACHODAVARAM RANGE									
Akumamidikota	1869.97	9435.74	462.93	437.1	501.46	7.04	12714.24	-1.83	1.83
Devarapalli	811.98	6093.03	513.85	540.45	112.22	0.00	8071.53	-11.24	11.24
Kakuru	1061.92	8335.33	180.42	162.4	52.24	111.06	9903.37	-6.51	6.51
Total	**11300.7**	**96004.1**	**5965.12**	**6439.18**	**3025.69**	**2007.5**	**124742.33**	**-19.58**	**19.58**
SUDIKONDA RANGE									
D.Velamalakota	827.97	6196.58	612.29	1056.37	292.81	5.3	8991.32	-5.52	5.52
Mallavaram East	0.00	727.16	90.39	36.00	58.16	190.79	1102.5	-6.58	0.00
Sudikonda South	0.61	453.02	77.47	54.38	25.55	0.00	611.03	-20.27	0.00
Total	**1304.45**	**24691.3**	**2881.65**	**2859.09**	**1467.94**	**1221.09**	**34425.49**	**-32.37**	**5.52**
Grand Total	**20305.1**	**235600**	**22026.2**	**18564.2**	**10138.3**	**16905.96**	**323539.57**	**-72.34**	**35.74**

Manage the use of renewable resources such as water, soil, forest products and marine life in ways that do not exceed rates of regeneration and that protect the health of ecosystem. Earth charter & Gandhi. - Earth charter & Gandhi page 21

Rajahmundry Circle

4.35 KRISHNA DIVISION

4.35.1 Introduction:

Krishna Forest Division comprises of the entire Krishna district lies in the north eastern part of Andhra Pradesh between latitudes 15^0 42' 19'' and 17^0 9' 10'' N and longitudes 80^0 00'07'' and 81^0 33' 13''E. Geographical area of the Division is 8,727 Km^2. 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 4.35.1

The temperature varies from17^0C in December to 45^0C in the summer and the average annual rainfall is 1028 mm.

Deccan traps, alluvial deposits, lower or upper Gondwana sediments, khondalites and chalcolites 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^2.

Table 4.35.1: Land use Pattern

Land use	Area in SqKm	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
Total	**8727.00**	

4.35.2 Recorded Forest Area:

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

4.35.3 Protected Area:

Two Protected Areas, viz., Kolleru and Krishna Wildlife Sanctuaries fall in the Division. An area of 308.55 Km^2 of forest area of this Division forms a part of Kolleru WLS and 194.81 Km^2 of Krishna WLS.

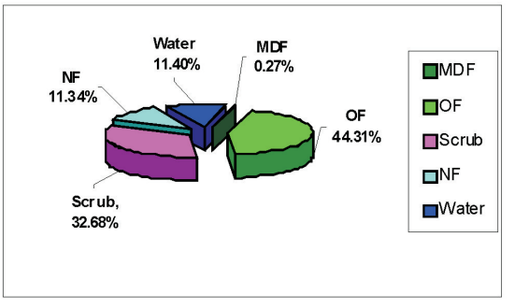
4.35.4 Community Forest Management:

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

4.35.5 Forest Cover:

The forest cover in the Division based on the interpretation of IRS P6 LISS III 2010 data (Dec 2010 - Jan 2011) is **287.33 Km^2** which is 3.29% of the geographical area. In terms of the forest canopy density classes the Division has 1.74 Km^2 of Moderately Dense Forests and 285.59 Km^2 of Open Forests. The area of the Scrub is

Fig 4.35.1



210.61 Km^2, that of Non-Forest 73.12 Km^2 and Water Bodies 73.46 Km^2. The distribution of the forest cover of the Division is shown in Fig 4.35.1

4.35.6 Change in Forest Cover:

The satellite images of 2009 and 2010 seasons are shown in Figs 4.35.2 & 4.35.3 respectively and the changes between this period are shown on the image of 2010.

Comparison of the current forest cover with that of previous assessment year shows a **negative change of 41.96 Ha**. The forest cover change matrix of given in Table 4.35.2 reveals that there is a decrease of 41.96 Ha of open forest and 4.30 Ha of scrub.

A negative change (including scrub) of 27.66 Ha is on account of clearence of jungle growth for raising of plantations and 18.6 Ha on account of encroachments. As clearence of 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 **18.6 Ha** .

There are 34 Beats in the Division. Negative changes in forest cover are noticed in 5 Beats. There are no changes in the remaining 29 Beats.

Details of forest cover changes in these 5 Beats are shown in Table 4.35.3.

Fig 4.35.2

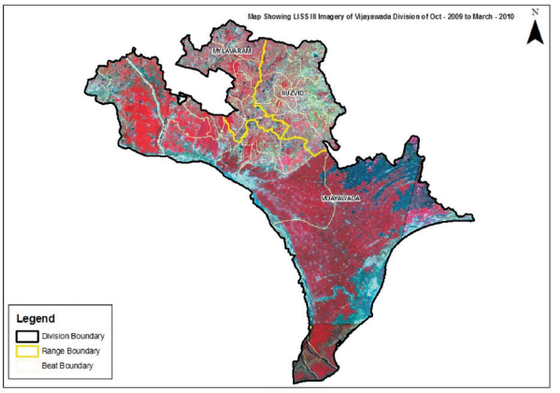


Fig 4.35.3

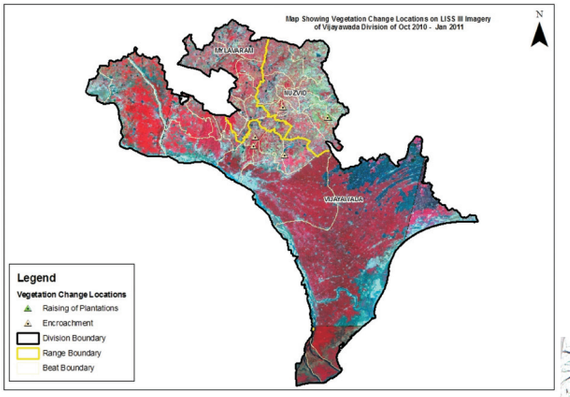


Table 4.35.2: Forest Cover change matrix (Area in Km^2)

2009	2010						Total of 2009
	VDF	MDF	OF	Scrub	NF	WB	
Very Dense Forest	0.00	0.00	0.00	0.00	0.00	0.00	**0.00**
Moderately Dense Forest	0.00	1.74	0.00	0.00	0.00	0.00	**1.74**
Open Forest	0.00	0.00	285.51	0.00	0.42	0.00	**285.93**
Scrub	0.00	0.00	0.00	210.69	0.04	0.00	**210.73**
Non-Forest	0.00	0.00	0.00	0.00	72.66	0.00	**72.66**
Water	0.00	0.00	0.00	0.00	0.00	73.46	**73.46**
Total of 2010	**0.00**	**1.74**	**285.51**	**210.69**	**73.12**	**73.46**	**644.52**
Net Change	0.00	0.00	-0.42	-0.04	0.46	0.00	

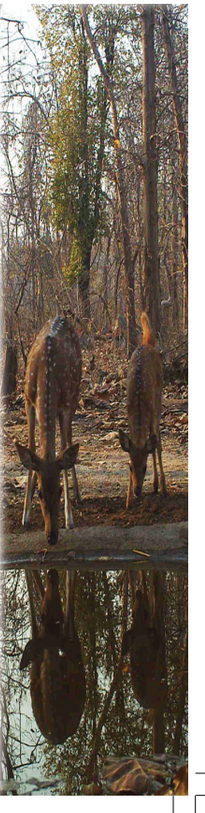


Table 4.35.3: List of Beats with negative change in Forest Cover (Area in Ha)

Beat	VDF	MDF	OF	Scrub	NF	WB	Total	Net Change	Encroachments
ONIPENTA RANGE									
Katrenupadu	0.00	72.67	412.36	848.73	373.23	0.00	1706.99	-34.83	7.17
Sunkollu	0.00	0.00	595.87	804.75	16.84	0.00	1417.46	-0.90	0.90
Total	**0.00**	**72.67**	**1008.23**	**1653.48**	**390.07**	**0.00**	**3124.45**	**-35.73**	**8.07**
VIJAYAWADA RANGE									
Koduru	0.00	0.00	1083.26	577.13	24.97	0.00	1685.36	-2.69	2.69
Kothurutadepalli	0.00	35.08	1748.6	469.11	131.82	0.70	2385.31	-3.54	3.54
Metlapalli	0.00	0.00	46.55	404.8	5.72	0.00	457.07	-4.30	4.30
Total	**0.00**	**35.08**	**2878.41**	**1451.04**	**162.51**	**0.70**	**4527.74**	**-10.53**	**10.53**
Grand Total	**0.00**	**107.75**	**3886.64**	**3104.52**	**552.58**	**0.70**	**7652.19**	**-46.26**	**18.60**

4.36 NARSIPATNAM DIVISION

4.36.1 Introduction:

Narsipatnam Forest Division lies in the north-eastern part of Andhra Pradesh between latitudes 17^0 27' 33" and 18^0 07' 02" N and longitudes 81^0 51'47" and 82^0 47' 59" E. Geographical area of the Division is 3754.99 Km^2 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 in to Bay of Bengal.

Land use pattern of the Division is given in Table 4.36.1.

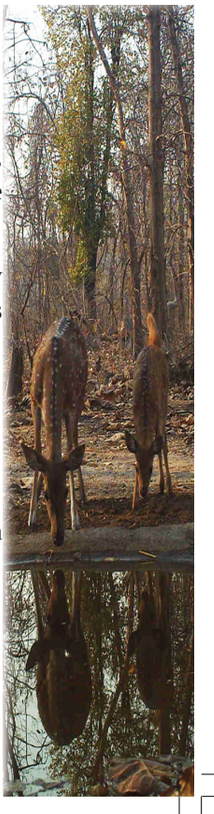
The climate of the Division is characterized by three distinct seasons. i) Summer (ii) Rainy and (iii) Winter seasons. The temperature ranging from 5^0 C to 45^0 C and annual rainfall is about 712mm, received mainly from Southwest monsoons.

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 charnokite and granites and coastal sand dunes of quartzite.

Table 4.36.1: Land use Pattern

Land use	Area in SqKm	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
Total	**3755.00**	

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^2.



4.36.2 Recorded Forest Area.

The Notified forest area of the Division is **2353.72 Km^2** which is 62.67% of the geographical area. Reserved, Protected and Un-classed forests constitute 989.92 Km^2 (42.12%), 1356.31 Km^2 (57.71%) and 4.05 Km^2 (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.

4.36.3 Protected Area:

There is no Protected Area in this Division.

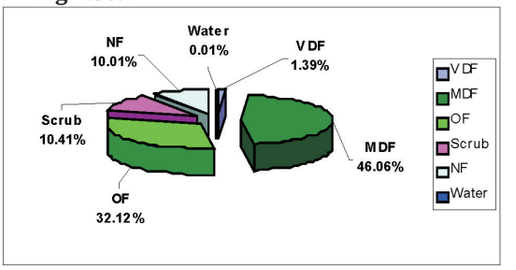
4.36.4 Community Forest Management:

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

4.36.5 Forest Cover:

The forest cover in the Division based on the interpretation of IRS P6 LISS III 2010 (Data of Sep 2010-Jan 2011) is **1873.08 Km²** which is 49.89 % of the geographical area. In terms of the forest canopy density classes the Division has 32.80 Km² of Very Dense Forests, 1084.21 Km² of Moderately Dense Forests and 755.94 Km² of Open Forests. The area of the Scrub is 244.93 Km², Non-Forest 235.54 Km² and Water Bodies 0.33 Km². The distribution of the forest cover of the Division is shown in Fig 4.36.1.

Fig 4.36.1



4.36.6 Change in Forest Cover:

The satellite image of 2009 and 2010 seasons are shown in Figs. 4.36.2 and Fig 4.36.3 respectively and the changes between this period are shown on the image of 2010.

Comparison of the current forest cover with that of previous assessment year shows a **negative change in forest cover of 20.63 Ha.** The forest cover change matrix given in Table 4.36.2 reveals that there is a decrease of 20.63 Ha of open forest.

The entire negative change of 20.63 Ha is on account of encroachments; which is taken as loss of forest cover. Therefore the **net loss of forest cover** is **20.63 Ha**.

Fig 4.36.2

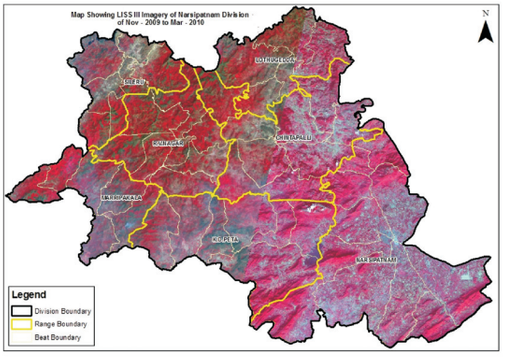
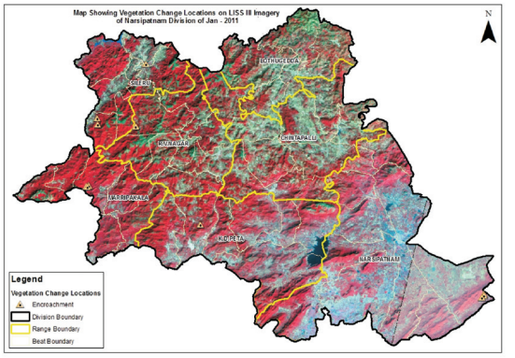


Fig 4.36.3



There are **52 Beats** in the Division. Negative changes in forest cover are noticed in 6 Beats. There are no changes in the remaining 46 Beats.

Details of forest cover changes in the 6 Beats mentioned above are shown in **Table 4.36.3.**

Table 4.36.2: Forest Cover change matrix (Area in Km²)

2009	2010						Total of 2009
	VDF	MDF	OF	Scrub	NF	WB	
Very Dense Forest	32.80	0.00	0.00	0.00	0.00	0.00	**32.80**
Moderately Dense Forest	0.00	1084.21	0.00	0.00	0.00	0.00	**1084.21**
Open Forest	0.00	0.00	755.94	0.00	0.21	0.00	**756.15**
Scrub	0.00	0.00	0.00	244.93	0.00	0.00	**244.93**
Non-Forest	0.00	0.00	0.00	0.00	235.33	0.00	**235.33**
Water	0.00	0.00	0.00	0.00	0.00	0.33	**0.33**
Total of 2010	**32.80**	**1084.21**	**755.94**	**244.93**	**235.54**	**0.33**	**2353.75**
Net Change	0.00	0.00	-0.21	0.00	0.21	0.00	

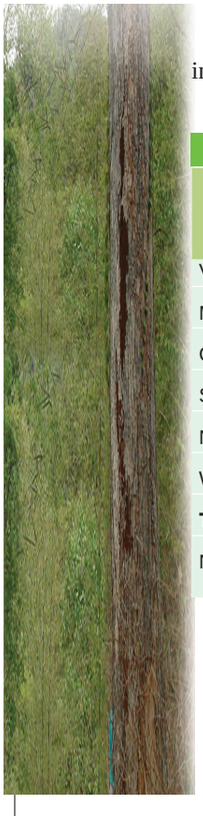


Table 4.36.3: List of Beats with negative change in Forest Cover (Area in Ha)

Beat	VDF	MDF	OF	Scrub	NF	WB	Total	Net Change	Encroachments
K.D. PETA RANGE									
Koyyuru	51.79	3949.2	1645.73	374.62	387.08	0.00	6408.42	-1.99	1.99
Total	**51.79**	**3949.2**	**1645.73**	**374.62**	**387.08**	**0.00**	**6408.42**	**-1.99**	**1.99**
MARRIPAKALA RANGE									
Palakajeedi	779.74	4722.36	935.45	248.8	189.08	0.00	6875.43	-3.24	3.24
Total	**779.74**	**4722.36**	**935.45**	**248.8**	**189.08**	**0.00**	**6875.43**	**-3.24**	**3.24**
NARSIPATNAM RANGE									
Koduru	0.75	1296.72	1658.8	253.24	89.68	0.00	3299.19	-4.70	4.70
Total	**0.75**	**1296.72**	**1658.8**	**253.24**	**89.68**	**0.00**	**3299.19**	**-4.70**	**4.70**
R.V.NAGAR RANGE									
Lankapakalu	97.67	4391.49	2082.79	537.54	516.06	0.00	7625.55	-5.38	5.38
Total	**97.67**	**4391.49**	**2082.79**	**537.54**	**516.06**	**0.00**	**7625.55**	**-5.38**	**5.38**
SILERU RANGE									
Duppulawada	0.00	744.91	1072.85	609.09	687.65	0.00	3114.5	-3.92	3.92
Kondajartha	317.88	2655.76	550.32	121.72	254.44	0.00	3900.12	-1.40	1.40
Total	**317.88**	**3400.67**	**1623.17**	**730.81**	**942.09**	**0.00**	**7014.62**	**-5.32**	**5.32**
Grand Total	**1247.83**	**17760.44**	**7945.94**	**2145.01**	**2123.99**	**0.00**	**31223.21**	**-20.63**	**20.63**

Care for the community of life with understanding, compassion and love and accept that with the right to own, manage and use natural resources comes the duty to prevent environmental harm and to protect the right of people. - Young India 6, Oct 1921, CWMG vol 21, 239

Vishakapatnam Circle

4.37 PADERU DIVISION

4.37.1 Introduction:

Paderu Forest Division lies in the northern part of Vishakhapatnam district between latitudes 17^0 55' 48'' and 18^0 32' 59'' N and longitudes 82^0 18' 41'' and 83^0 01' 04'' E. Geographical area of the Division is 2336 km^2 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 4.37.1.

The Divisions geology comprises of 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 charnokite and granites; black cotton soils come up next having sizeable chunks of area in K. Kotapadu, Devarapalli, Cheedikada, Paderu and Hukumpeta Mandals.

Table 4.37.1: Land use Pattern

Land use	Area in SqKm	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
Total	**2336.20**	

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 10^0 C to 35^0C 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^2.

4.37.2 Recorded Forest Area:

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

As per Champion and Seth 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.

4.37.3 Protected Area:

There is no Protected Area in this Division.

4.37.4 Community Forest Management:

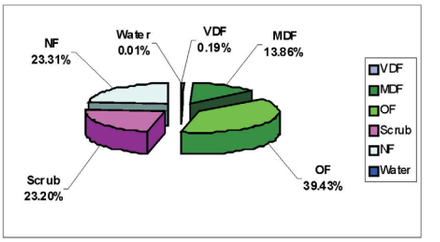
There are 303 VSSs in the Division with 270.90 Km^2 of forest area, which constitutes 26.65 % of forest area.

4.37.5 Forest Cover:

The forest cover in the Division based on the interpretation of IRS P6 LISS III 2010 data (Oct2010-Mar2011) is **540.95 Km^2** which is 23.15% of geographical area. In terms of forest canopy density classes the Division has 1.91 Km^2

of Very Dense Forests, 140.21 Km^2 of Moderately Dense Forests and 398.83 Km^2 of Open Forests. The area of the Scrub is 234.67 Km^2, Non-Forest 235.79 Km^2 and Water Bodies 0.11 Km^2. The distribution of the forest cover of the Division is shown in Fig 4.37.1.

Fig 4.37.1.



4.37.6 Change in Forest Cover:

The Satellite images of 2009 and 2010 seasons are shown in Figs. 4.37.2 and 4.37.3 respectively and the changes between this period are shown on the image of 2010.

Comparison of the current forest cover with that of previous assessment year shows a **negative change in forest cover of 1.62 Ha** and **positive change of 14.80 Ha**. The forest cover change matrix given in Table 4.37.2 reveals that there is a decrease of 1.62 Ha of open forest and 10.32 Ha of scrub.

The positive change 14.80 Ha is on account of growth in raised plantations. The total negative change 26.74 Ha is on account of encroachments, hence the same has been taken as loss of forest cover.

There are 20 Beats in the Division. Changes in forest cover are noticed in 5 Beats. Negative changes in forest cover are noticed in 3 Beats and poistive change in 1 Beat and both positive and negative change in 1 Beat. There are no changes in remaining 15 Beats.

Details of forest cover changes in these 5 Beats are shown in Table 4.37.3.

Fig 4.37.2

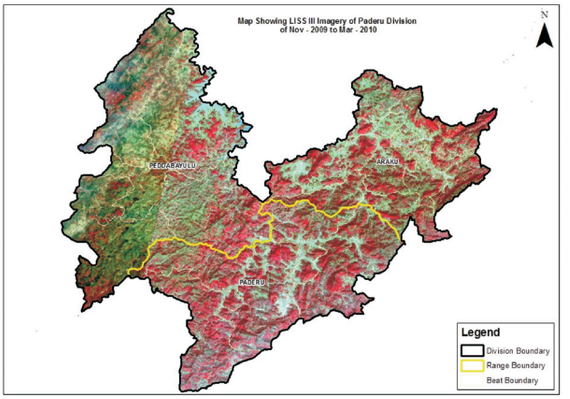


Fig 4.37.3

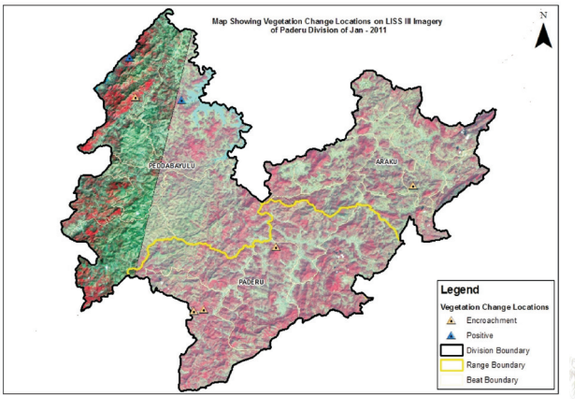


Table 4.37.2: Forest Cover change matrix (Area in Km^2)

2009	2010						Total of 2009
	VDF	MDF	OF	Scrub	NF	WB	
Very Dense Forest	1.91	0.00	0.00	0.00	0.00	0.00	**1.91**
Moderately Dense Forest	0.00	140.21	0.00	0.00	0.00	0.00	**140.21**
Open Forest	0.00	0.00	398.83	0.00	0.02	0.00	**398.85**
Scrub	0.00	0.00	0.00	234.52	0.25	0.00	**234.77**
Non-Forest	0.00	0.00	0.00	0.15	235.52	0.00	**235.67**
Water	0.00	0.00	0.00	0.00	0.00	0.11	**0.11**
Total of 2010	**1.91**	**140.21**	**398.83**	**234.67**	**235.79**	**0.11**	**1011.52**
Net Change	0.00	0.00	-0.02	-0.10	0.12	0.00	

Table 4.37.3: List of Beats with negative change in Forest Cover (Area in Ha)

Beat	VDF	MDF	OF	Scrub	NF	WB	Total	Net Change	Encroachments
ARAKU RANGE									
Araku	0.00	164.46	1149.11	1201.23	1190.86	0.00	3705.66	-10.36	10.36
Total	**6.02**	**2004.53**	**8712.84**	**7368.2**	**6614.16**	**0.00**	**24705.8**	**-10.36**	**10.36**
PADERU RANGE									
G.Madugula	24.47	1742.56	4467.58	1537.9	741.09	0.00	8513.6	-6.69	6.69
Paderu	32.36	1458.35	4035.42	1564.67	581.55	0.00	7672.35	-1.62	1.62
Total	**99.14**	**5431.14**	**17233.7**	**8274.48**	**5552.03**	**0.00**	**36590.4**	**-8.31**	**8.31**
PEDABAYULU RANGE									
Machipuram	45.4	2426.1	4075.07	1509.73	1670.99	11.23	9738.52	3.77	8.07
Sujanakota	0.00	783.58	1795.66	1020.42	917.14	0.00	4516.8	2.96	0.00
Total	**85.73**	**6585.22**	**13936.4**	**7823.79**	**11413.6**	**11.23**	**39856**	**6.73**	**0.00**
Grand Total	**190.89**	**14020.9**	**39882.9**	**23466.5**	**23579.8**	**11.23**	**101152**	**-11.94**	**26.74**

4.38 SRIKAKULAM DIVISION

4.38.1 Introduction:

Srikakulam Forest Division which is co-terminus with the district lies in the north-eastern part of Andhra Pradesh between latitudes 17^0 45'' and 19^0 30'' N and longitudes 82^0 38' and 84^0 45' E. Geographical area of the Division is 5953.52Km^2. 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 4.38.1.

The climate of this Division is generally dry with temperatures ranging from 17^0 C to 37^0 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- granite, 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^2.

Table 4.38.1: Land use Pattern

Land use	Area in SqKm	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
Water Bodies	235.14	3.95
Total	**5953.50**	

4.38.2 Recorded Forest Area:

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

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

4.38.3 Protected Area:

There is no Protected Area in this Division.

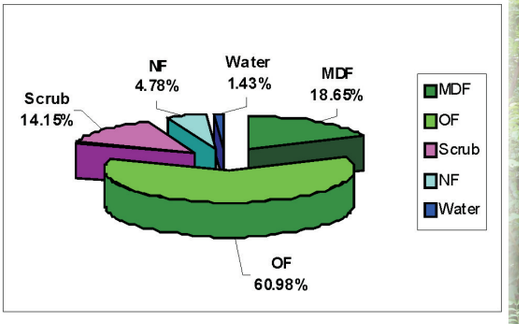
4.38.4 Community Forest Management:

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

4.38.5 Forest Cover:

The forest cover in the Division based on the interpretation of IRS P6 LISS III 2010 data (Nov 10-Jan 11) is **574.76 km^2** which is 10.36% of the geographical area. In terms of the forest canopy density classes the Division has 134.62 Km^2 of Moderately Dense

Fig 4.38.1



Forests and 440.14 Km^2 of Open Forests. The area of the Scrub is 102.11 Km^2, Non-Forest 34.50 Km^2 and Water Bodies 10.35 Km^2. The distribution of the forest cover of the Division is shown in Fig 4.38.1.

4.38.6 Change in Forest Cover:

The Satellite images of 2009 and 2010 seasons are shown in Figs. 4.38.2 and 4.38.3 respectively and the changes between this period are shown on the image of 2010.

Comparison of the current forest cover with that of previous assessment year shows a **negative change in forest cover of 16.37 Ha**. The forest cover change matrix given in Table 4.38.2 reveals that there is a decrease of 16.37 Ha of open forest.

The total negative change 16.37 Ha is on account of encroachments. Therefore the **net loss of forest cover is 16.37 Ha.**

Fig 4.38.2

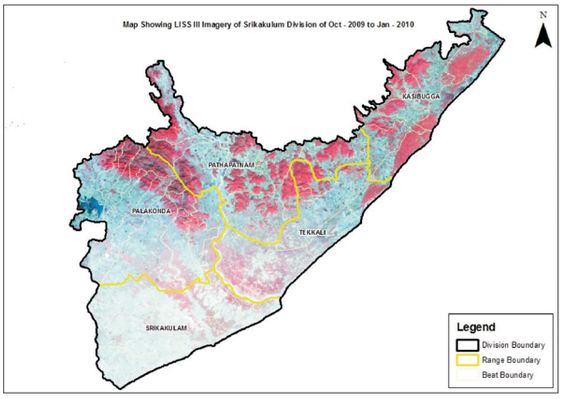
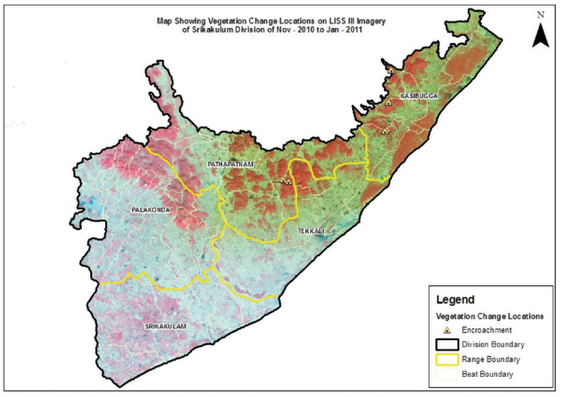


Fig 4.38.3



There are 43 Beats in the Division. Negative changes in forest cover are noticed in 6 Beats. There are no changes in the remaining 37 Beats.

Details of forest cover changes in the 6 Beats mentioned above are shown in Table 4.38.3.

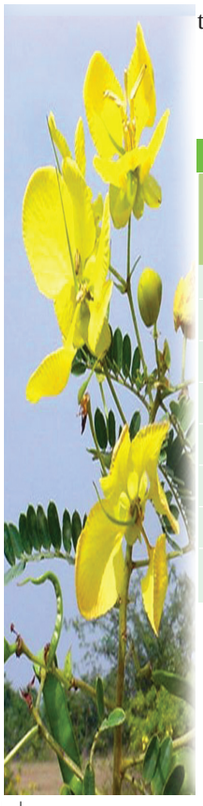


Table 4.38.2: Forest Cover change matrix (Area in Km^2)

2009	2010						Total of 2009
	VDF	MDF	OF	Scrub	NF	WB	
Very Dense Forest	0.00	0.00	0.00	0.00	0.00	0.00	**0.00**
Moderately Dense Forest	0.00	134.62	0.00	0.00	0.00	0.00	**134.62**
Open Forest	0.00	0.00	440.14	0.10	0.07	0.00	**440.31**
Scrub	0.00	0.00	0.00	102.01	0.00	0.00	**102.01**
Non-Forest	0.00	0.00	0.00	0.00	34.43	0.00	**34.43**
Water	0.00	0.00	0.00	0.00	0.00	10.35	**10.35**
Total of 2010	**0.00**	**134.62**	**440.14**	**102.11**	**34.50**	**10.35**	**721.72**
Net Change	0.00	0.00	-0.17	0.10	0.07	0.00	

Table 4.38.3: List of Beats with negative change in Forest Cover (Area in Ha)

Beat	VDF	MDF	OF	Scrub	NF	WB	Total	Net Change	Encroachments
KASIBUGGA RANGE									
Bogabanda	0.00	48.63	646.76	99.21	0.59	0.00	795.19	-1.36	1.36
Budarsingi	0.00	40.72	888.86	290.92	27.26	0.00	1247.76	-2.82	2.82
Makarajola	0.00	149.88	1058.22	550.58	76.38	0.00	1835.06	-3.92	3.92
Mandasa	0.00	19.6	1427.05	309.32	17.74	0.00	1773.71	-3.60	3.60
Total	**0.00**	**258.83**	**4020.89**	**1250.03**	**121.97**	**0.00**	**5651.72**	**-11.7**	**11.7**
PATHAPATNAM RANGE									
Antharaba	0.00	251.84	1724.37	246.94	18.79	0.00	2241.94	-2.20	2.20
Temburu	0.00	199.11	1981.08	333.22	27.1	0.00	2540.51	-2.47	2.47
Total	**0.00**	**450.95**	**3705.45**	**580.16**	**45.89**	**0.00**	4782.45	**-4.67**	**4.67**
Grand Total	**0.00**	**709.78**	**7726.34**	**1830.19**	**167.86**	**0.00**	**10434.2**	**-16.37**	**16.37**

Vishakapatnam Circle

4.39 VIZIANAGARAM DIVISION

4.39.1 Introduction:

Vizianagaram Forest Division which is co-terminus with district lies in the north-eastern part of Andhra Pradesh between latitudes 17^0 51' and 19^0 9'' N and longitude 82^0 58" and 83^0 49 E. Geographical Area of the Division is 6261 Km^2.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 4.39.1.

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 17.1^0 C to 39.6^0 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 of both the south-west and north-east monsoon.

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^2.

Table 4.39.1: Land use Pattern

Land use	Area in SqKm	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
Water Bodies	132.12	2.11
Total	**6261.64**	

4.39.2 Recorded Forest Area:

The area of notified forests of the Division is **1219.28 Km^2** which is 18.24% of the geographical area. Reserved, Protected and Un-classed forests constitute 716.27 Km^2 (60%), 420.10 Km^2 (35.2%) and 56.66 Km^2 (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.

4.39.3 Protected Area:

There is no Protected Area in this Division.

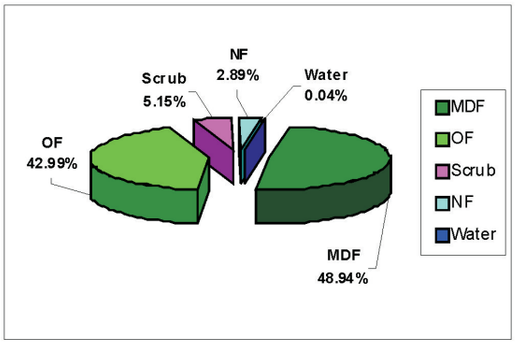
4.39.4 Community Forest Management:

There are 265 VSSs in the Division. An area of 305.59 Km^2 of forest area, which is 25% of the forest area is under the management of communities.

4.39.5 Forest Cover:

The forest cover in the Division based on the interpretation of IRS P6 LISS III 2010 data (Nov 10–Jan 11) is **1120.67 Km^2** which is 17.92% of the geographical area. In terms of the forest canopy density classes the Division has 595.98 Km^2 of Moderately Dense

Fig 4.39.1



Forests and 524.69 Km^2 of Open Forests. The area of the Scrub is 62.85 Km^2, Non-Forest 35.29 Km^2 and Water Bodies 0.44 Km^2. The distribution of the forest cover of the Division is shown in Fig 4.39.1.

4.39.6 Change in Forest Cover:

The Satellite images of 2009 and 2010 seasons are shown in Figs. 4.39.2 and 4.39.3 respectively and the changes between this period are shown on the image of 2010.

Comparison of the current forest cover with that of previous assessment year shows a **negative change in forest cover of 85.24 Ha**. The forest cover change matrix given in Table 4.39.2 reveals that there is a decrease of 78.49 Ha of moderately dense forest and 6.75 Ha of open forest.

The total negative change of 85.24 Ha is on account of encroachments. Therefore the **net loss of forest cover in the Division is 85.24 Ha**.

Fig.4.39.2

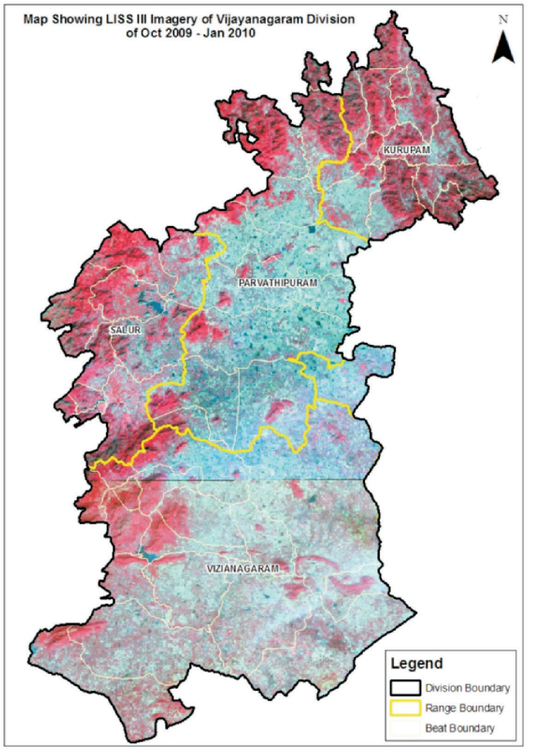
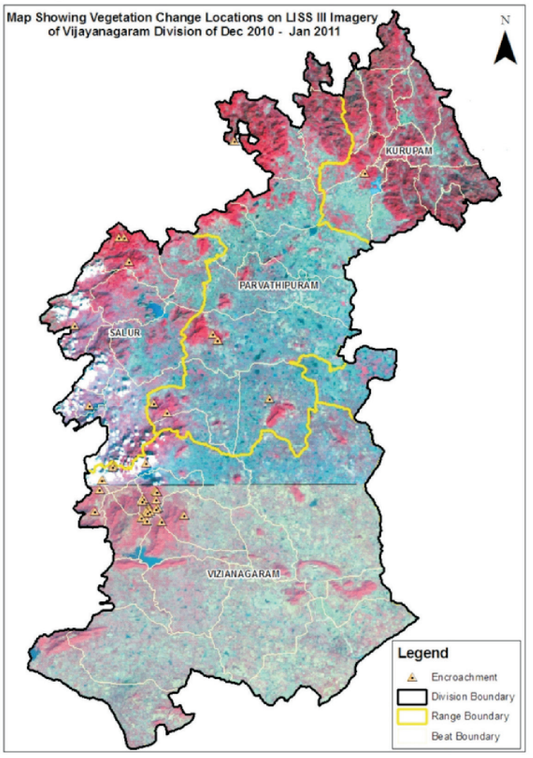


Fig.4.39.3



There are 49 Beats in the Division. Negative changes in forest cover are noticed in 15 Beats. There are no changes in remaining 34 Beats.

Details of forest cover change in these 15 Beats is shown in Tabel no. 4.39.3.

Table 4.39.2: Forest Cover change matrix (Area in Km^2)

2009	2010						Total of 2009
	VDF	MDF	OF	Scrub	NF	WB	
Very Dense Forest	0.00	0.00	0.00	0.00	0.00	0.00	**0.00**
Moderately Dense Forest	0.00	595.98	0.00	0.00	0.78	0.00	**596.76**
Open Forest	0.00	0.00	524.69	0.00	0.07	0.00	**524.76**
Scrub	0.00	0.00	0.00	62.85	0.00	0.00	**62.85**
Non-Forest	0.00	0.00	0.00	0.00	34.44	0.00	**34.44**
Water	0.00	0.00	0.00	0.00	0.00	0.44	**0.44**
Total of 2010	**0.00**	**595.98**	**524.69**	**62.85**	**35.29**	**0.44**	**1219.25**
Net Change	0.00	-0.78	-0.07	0.00	0.85	0.00	

Table 4.39.3: List of Beats with negative change in Forest Cover (Area in Ha)

Beat	VDF	MDF	OF	Scrub	NF	WB	Total	Net Change	Encroachments
KURUPAM RANGE									
Bori	0.00	292.25	477.62	85.09	59.14	4.84	918.94	-1.70	1.70
Total	**0.00**	**292.25**	**477.62**	**85.09**	**59.14**	**4.84**	**918.94**	**-1.70**	**1.70**
PARVATHIPURAM RANGE									
Bobbili	0.00	1534.35	751.16	149.93	101.14	0.00	2536.58	-2.00	2.00
Masimanda	0.64	6383.6	2693.5	157.74	50.86	0.36	9286.70	-2.36	2.36
Saluru (E)	0.00	1053.92	837.74	52.19	23.84	0.00	1967.69	-3.83	3.83
Shikarganj	0.00	561.87	743.21	167.34	324.28	0.00	1796.70	-3.90	3.90
Total	**0.64**	**9533.74**	**5025.61**	**527.2**	**500.12**	**0.36**	**15587.67**	**-12.09**	**12.09**
SALUR RANGE									
Duggeru	2.46	4531.9	1854.41	367.16	60.35	0.05	6816.33	-11.41	11.41
Kurukutti	0.00	1586.23	1274.81	90.05	32.31	0.2	2983.60	-0.96	0.96
Pachipenta	0.00	278.17	219.16	19.19	20.44	0.00	536.96	-1.01	1.01
Total	**2.46**	**6396.3**	**3348.38**	**476.4**	**113.1**	**0.25**	**10336.89**	**-13.38**	**13.38**
VIZIANAGARAM RANGE									
Andra	0.00	1052.7	472.17	49.05	11.23	0.00	1585.15	-1.29	1.29
Bhimaram	0.00	1967.06	762.45	62.36	97.73	0.1	2889.70	-31.15	31.15
Kothapalem	0.00	2058.85	904.93	113.81	22.53	7.33	3107.45	-1.29	1.29
Pedakonela	0.00	2992.52	2099.55	132.47	57.34	0.26	5282.14	-10.17	10.17
Rabha	0.00	1606.8	747.65	42.28	18.17	1.05	2415.95	-1.40	1.40
Rompilli	0.00	1101.93	367.27	32.69	37.87	0.29	1540.05	-7.35	7.35
Sariapalli	0.00	1674.76	984.96	56.14	27.4	0.07	2743.33	-5.42	5.42
Total	**0.00**	**12454.6**	**6338.98**	**488.8**	**272.27**	**9.1**	**19563.77**	**-58.07**	**58.07**
Grand Total	**3.10**	**28676.9**	**15190.6**	**1577.49**	**944.63**	**14.55**	**46407.27**	**-85.24**	**85.24**

4.40 VISHAKHAPATNAM DIVISION

4.40.1 Introduction:

Vishakhapatnam Forest Division lies in the southern part of Vishakhapatnam district between latitudes 17^0 15' 00'' and 18^0 26' 25'' N and longitudes 82^0 31' 04'' and 83^0 27' 40'' E. Geographical area of the Division is 5069 Km^2 which is 45 % of the geographical area of district. The Division has two physiographic zones, the plains and the hills. The major rivers falling in the Division are Thadava, Varaha and Sharada.

Land use pattern of the division is given in Table 4.40.1.

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 18^0C to 45^0C and the annual rainfall is about 1202mm, received mainly from south-west and 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^2.

Table 4.40.1: Land use Pattern

Land use	Area in SqKm	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
Total	**5069.80**	

4.40.2 Recorded Forest Area:

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

4.40.3 Protected Area:

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

4.40.4 Community Forest Management:

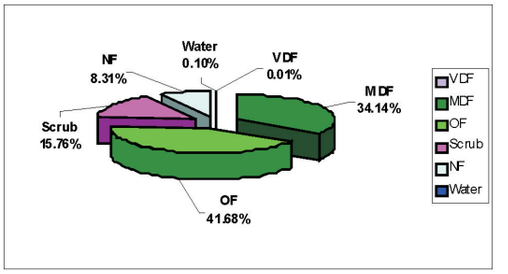
There are 321 Vana Samrakshana Samities (VSSs) in the Division. An area of 271.93 Km^2 of notified forests, which is 21 % of forest area, is under the management of VSSs.

4.40.5 Forest Cover:

The forest cover in the Division based on the interpretation of IRS P6 LISS III 2010 (Data of Jan 11) is **960.13 Km^2** which is 18.93% of the geographical area. In terms of the forest canopy density classes the Division has 0.15 Km^2 of Very Dense Forests, 432.24 Km^2 of Moderately Dense Forests and 527.74 Km^2 of Open Forests. The area of the scrub is 199.54

Km^2 , Non-Forest 105.16 Km^2 and Water Bodies 1.23 Km^2. The distribution of the forest cover of the Division is shown in Fig 4.40.1.

Fig 4.40.1



4.40.6 Change in Forest Cover:

The satellite image of 2009 and 2010 seasons are shown in Figs. 4.40.2 and 4.40.3 respectively and the changes between this period are shown on the image of 2010.

Comparison of the current forest cover with that of previous assessment year shows a **negative change in forest cover of 26.74 Ha**. The change matrix given in Table 4.40.2 reveals that there is a decrease of 10.57 Ha of moderately dense forest and 16.17 Ha of open forest.

A negative change of 24.27 Ha is on account of encroachments and 2.47 Ha on account of diversion of forestland for non-forestry purposes. Only the negative change due to encroachment is taken as loss of forest cover, therefore the **net loss of forest cover is 24.27 Ha**.

Fig 4.40.2

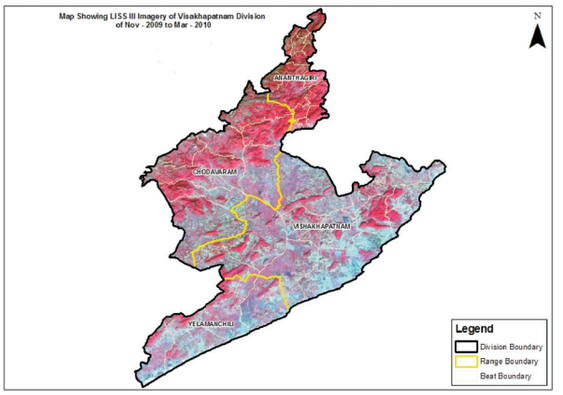
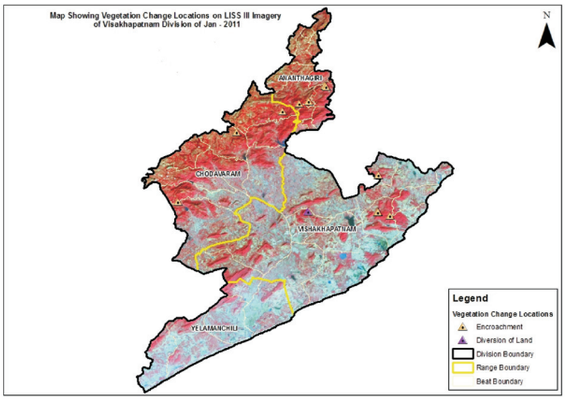
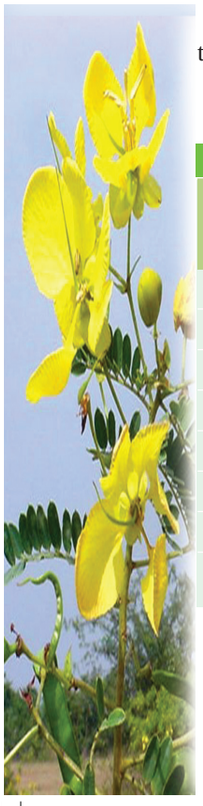


Fig 4.40.3





There are 40 Beats in the Division. Negative changes in forest cover are seen in 8 Beats and there are no changes in the remaining 32 Beats.

Details of forest cover changes in the 8 Beats are shown in Table 4.40.3.

Table 4.40.2: Forest Cover change matrix (Area in Km^2)

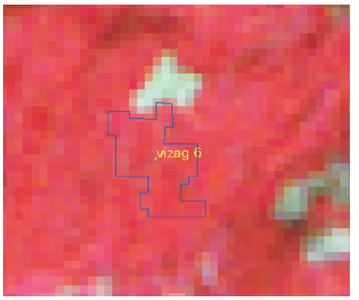
2009	2010						Total of 2009
	VDF	MDF	OF	Scrub	NF	WB	
Very Dense Forest	0.15	0.00	0.00	0.00	0.00	0.00	**0.15**
Moderately Dense Forest	0.00	432.24	0.00	0.00	0.11	0.00	**432.35**
Open Forest	0.00	0.00	527.74	0.00	0.16	0.00	**527.90**
Scrub	0.00	0.00	0.00	199.54	0.00	0.00	**199.54**
Non-Forest	0.00	0.00	0.00	0.00	104.89	0.00	**104.89**
Water	0.00	0.00	0.00	0.00	0.00	1.23	**1.23**
Total of 2010	**0.15**	**432.24**	**527.74**	**199.54**	**105.16**	**1.23**	**1266.06**
Net Change	0.00	-0.11	-0.16	0.00	0.27	0.00	

Table 4.40.3: List of Beats with negative change in Forest Cover (Area in Ha)

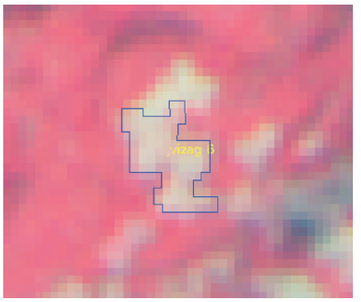
Beat	VDF	MDF	OF	Scrub	NF	WB	Total	Net Change	Encroachments
ANANTHAGIRI RANGE									
Kuridi	0.00	1328.41	1670.85	271.89	162.42	0.00	3433.57	-8.06	8.06
Medaparthy	0.00	1793.08	3276.62	1093.16	521.85	0.00	6684.71	-6.78	6.78
Total	**0.00**	**3121.49**	**4947.47**	**1365.05**	**684.27**	**0.00**	**10118.3**	**-14.84**	**14.84**
CHODAVARAM RANGE									
Kinthali	0.52	3276.89	2105.82	381.74	175.29	1.95	5942.21	-0.76	0.76
Konam	1.79	1696.39	3710.32	1250.41	439.01	0.00	7097.92	-1.29	1.29
Tattapudi	4.75	3114.83	3351.83	1948.12	1127.3	0.00	9546.83	-0.83	0.83
Total	**7.06**	**8088.11**	**9167.97**	**3580.27**	**1741.6**	**1.95**	**22587**	**-2.88**	**2.88**
VISHAKHAPATNAM RANGE									
Advanipalem	0.00	93.97	727.35	548.99	353.95	0.00	1724.26	-2.06	2.06
Mudasarlova	0.00	1527.83	1791.95	569.55	254.42	0.00	4143.75	-4.49	4.49
Pothukonda	0.00	203.05	889.48	409.85	336.7	0.00	1839.08	-2.47	0.00
Total	**0.00**	**1824.85**	**3408.78**	**1528.39**	**945.07**	**0.00**	**7707.09**	**-9.02**	**6.55**
Grand total	**7.06**	**13034.5**	**17524.2**	**6473.71**	**3370.94**	**1.95**	**40412.3**	**-26.74**	**24.27**

Satellite Images

2009



2010



Longitude	83.05219^0 E
Latitude	18.14975^0 N
Area in Ha	50.40
Change	MDF to Scrub
Compt No	511
Beat	Medaparthy
Range	Ananthagiri
Division	Visakhapatnam

Ensure that the use of orbital and outer space supports environmental protection and space.
-Earth charter & Gandhi page 61

Warangal Circle

4.41 KARIM NAGAR EAST DIVISION

4.41.1 Introduction:

Karim Nagar East Forest Division lies in the eastern part of Karim Nagar district between latitudes 18^0 20' 53'' and 18^0 52' 14'' N and longitudes 79^0 10' 48'' and 80^0 20' 44'' E. Geographical area of the Division is 3,814 Km^2 which is 32.25% of the geographical area of district. This Division lies on deccan plateau. The River Godavari forms the northern- and eastern boundaries of the Division as wells as the district. Godavari and Maneru are main rivers of Karimnagar East Division.

Land use pattern of the Division is given in Table 4.41.1.

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

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

Population of the Division is 1.12 million (2011 Census), per capita forest area is 0.12 Ha and the population density is 542 persons per Km^2.

Table 4.41.1: Land use Pattern

Land use	Area in SqKm	Percentage
Forest including Scrub	**1333.62**	34.97
Agriculture	1292.93	33.90
Land with Scrub	314.00	8.23
Fallow Lands	217.32	5.70
Settlements	32.87	0.86
Vegetation outside Forest	548.56	14.38
Water Bodies	74.65	1.96
Total	**3814.00**	

4.41.2 Recorded Forest Area:

The notified forest area of the Division is **1432.1 Km^2** which is 37.55% of the geographical area. Reserved, Protected and un-classed forests constitute 1382.13 Km^2 (96.51%), 27.43 Km^2 (1.913%) and 22.54 Km^2 (1.573%) of the forest area respectively.

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

4.41.3 Protected Area:

A portion of the Shivaram Wildlife Sanctuary is included in this Division. An area of 19.15 $Km^2$is included in the WLS.

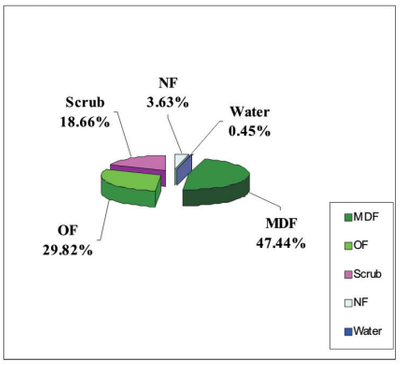
4.41.4 Community Forest Management:

There are 127 Vana Samrakshana Samities (VSSs) in the Division spread over an area of 314.05 Km^2 of forest area, which is 21.93 % of the forest area.

4.41.5 Forest Cover:

The forest cover in the Division based the interpretation of IRS P6 LISS III 2010 data (Oct 2010-Dec 2010) is **1071.52 Km^2** which is 28.09% of the geographical area. In terms of the forest canopy density classes the Division has 657.93 Km^2 of Moderately Dense Forests and 413.59 Km^2 of Open Forests. The area of the Scrub is 258.72 Km^2; Non-Forest 50.31 Km^2 and Water Bodies 6.26 Km^2.The distribution of the forest cover of the Division is shown in Fig 4.41.1.

Fig 4.41.1



4.41.6 Change in Forest Cover:

The Satellite images of 2009 and 2010 seasons are shown in Figs 4.41.2 and Fig 4.41.3 respectively and the changes between this period are shown on the image of 2010.

Comparison of the current forest cover with that of previous assessment year shows a **positive change 10.48 Ha** and **negative change of 4.71 Ha**. The forest cover change matrix given in Table 4.41.2 reveals that there is a decrease of 4.11 Ha of moderately dense forest, 66.65 Ha of scrub and increase of 9.88 Ha in Open Forest.

The positive change 10.48 Ha is on account of growth in raised plantations. The negative change (including scrub) of 4.11 Ha is on account of clearance of jungle growth for raising of plantations, 0.60Ha on account of encroachments and 66.65 Ha on account of diversion of forestlands for non-forestry purpose. As raising of plantation is a Forest management intervention and hence not considered as loss of forest cover. Thus only the negative change due to encroachment is taken as loss of forest cover. Therefore the **net loss of forest cover is 0.60 Ha** only.

Fig.4.41.2

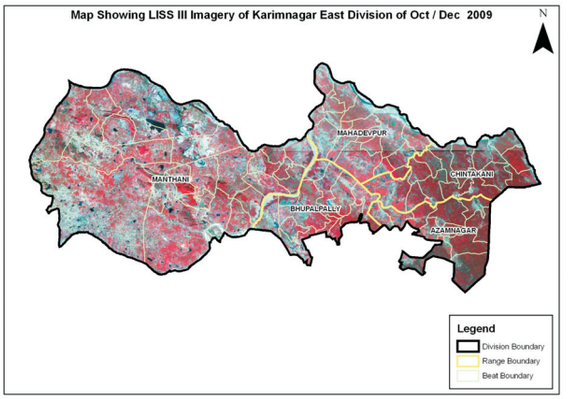
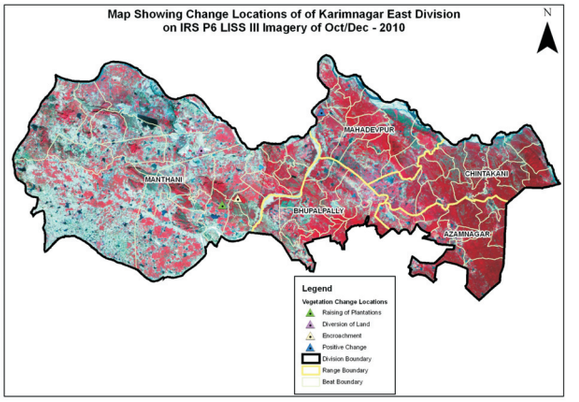


Fig.4.41.3



There are 78 Beats in the Division. Negative changes in forest cover are noticed in 3 Beats only and positive change in 1 Beat. There are no changes in the remaining 74 Beats.

Details of forest cover changes in 4 Beats mentioned above are shown in Table 4.41.3.

Table 4.41.2: Forest Cover change matrix (Area in Km^2)

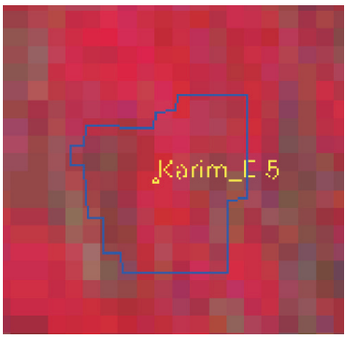
2009	2010						Total of 2009
	VDF	MDF	OF	Scrub	NF	WB	
Very Dense Forest	0.00	0.00	0.00	0.00	0.00	0.00	**0.00**
Moderately Dense Forest	0.00	657.93	0.00	0.00	0.04	0.00	**657.97**
Open Forest	0.00	0.00	413.49	0.00	0.01	0.00	**413.50**
Scrub	0.00	0.00	0.00	258.72	0.67	0.00	**259.39**
Non-Forest	0.00	0.00	0.10	0.00	49.59	0.00	**49.69**
Water	0.00	0.00	0.00	0.00	0.00	6.26	**6.26**
Total of 2010	**0.00**	**657.93**	**413.59**	**258.72**	**50.31**	**6.26**	**1386.81**
Net Change	0.00	-0.04	0.09	-0.67	0.62	0.00	

Table 4.41.3: List of Beats with negative change in Forest Cover (Area in Ha)

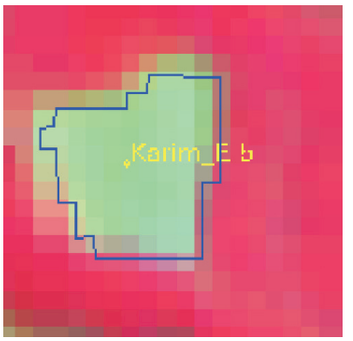
Beat	VDF	MDF	OF	Scrub	NF	WB	Total	Net Change	Encroachments
MAHADEVPUR RANGE									
Annaram	0.00	620.48	480.35	480.12	35.03	1.26	1617.24	10.48	0.00
Total	**0.00**	**620.48**	**480.35**	**480.12**	**35.03**	**1.26**	**1617.24**	**10.48**	**0.00**
MANTHANI RANGE									
Gunjapadugu	0.00	0.00	1.62	116.52	322.81	112.21	553.16	-66.65	0.00
Khammampally	0.00	366.60	784.44	465.95	28.36	0.00	1645.35	-0.60	0.60
Maidambanda	0.00	677.03	272.84	88.42	14.13	11.69	1064.11	-4.11	0.00
Total	**0.00**	**1043.63**	**1058.90**	**670.89**	**365.30**	**123.90**	**3262.62**	**-71.36**	**0.60**
Grand Total	**0.00**	**1664.11**	**1539.25**	**1151.01**	**400.33**	**125.16**	**4879.86**	**-60.88**	**0.60**

Satellite Images

2009



2010



Longitude	79.62652^0 E
Latitude	18.5512^0 N
Area in Ha	4.11
Change	MDF to NF
Compt No	461
Beat	Maidambanda
Range	Begampet
Division	Karimnagar East

Mange the extraction and use of non- renewable resources such as minerals and fossil fuels in ways that minimize depletion and cause no serious environmental damage. *- Earth charter & Gandhi page 21*

Warangal Circle

4.42 KARIM NAGAR WEST DIVISION

4.42.1 Introduction:

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

Land use pattern of the Division is given in Table 4.42.1.

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

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

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

Table 4.42.1: Land use Pattern

Land use	Area in SqKm	Percentage
Forest including Scrub	959.19	11.98
Agriculture	5315.40	66.37
Land with Scrub	705.84	8.81
Fallow Lands	246.07	3.07
Settlements	123.64	1.54
Vegetation outside Forest	426.79	5.33
Water Bodies	232.06	2.90
Total	**8009.00**	

4.42.2 Recorded Forest Area:

The notified forest area of the Division is **1044.71 Km^2** which is 13.04% of the geographical area. Reserved, Protected and Un-classed forests constitute 864.29 Km^2 (82.73%), 168.72 Km^2 (16.15%) and 11.70 Km^2 (1.12%) of the forest area respectively.

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

4.42.3 Protected Area:

There are no Protected Areas in the Division.

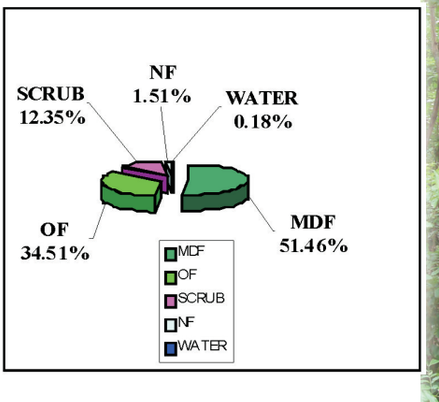
4.42.4 Community Forest Management:

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

4.42.5 Forest Cover:

The forest cover in the Division based on the interpretation of IRS P6 LISS III 2010 data (Oct/Dec 2010) is **839.00 Km^2** which is 10.48% of the geographical area. In terms of the forest canopy density classes, the Division has 501.42 Km^2 of Moderately Dense Forests and 336.27 Km^2 of Open Forests.

Fig 4. 42.1



The area of the Scrub is 120.31 Km^2, Non-Forest 14.69 Km^2 and Water Bodies 1.78 Km^2. The distribution of the forest cover of the Division is shown in Fig 4.42.1

Fig 4. 42.2

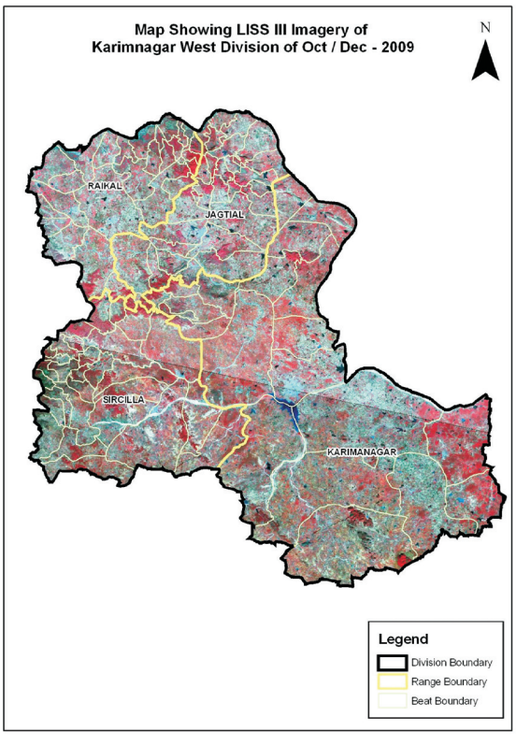
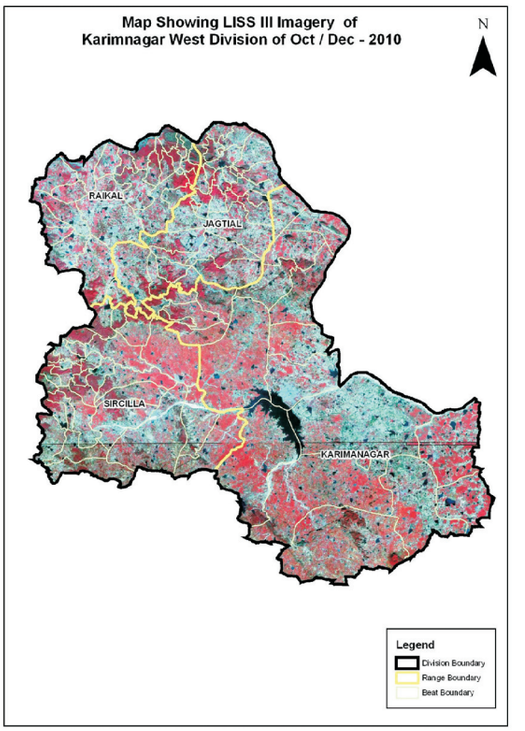


Fig 4. 42.3



4.42.6 Change in Forest Cover:

The Satellite images of 2009 and 2010 seasons are shown in Figs 4.42.2 and 4.42.3 respectively. There are no changes in the forest cover during this period this Division. Therefore the **net loss of forest cover is Nil**.

The forest cover change matrix is given in Table 4.42.2.

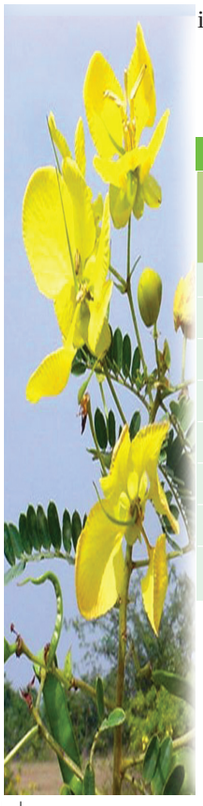


Table 4.42.2: Forest Cover change matrix (Area in Km^2)

2009	2010						Total of 2009
	VDF	MDF	OF	Scrub	NF	WB	
Very Dense Forest	0.00	0.00	0.00	0.00	0.00	0.00	**0.00**
Moderately Dense Forest	0.00	501.42	0.00	0.00	0.00	0.00	**501.42**
Open Forest	0.00	0.00	336.27	0.00	0.00	0.00	**336.27**
Scrub	0.00	0.00	0.00	120.31	0.00	0.00	**120.31**
Non-Forest	0.00	0.00	0.00	0.00	14.69	0.00	**14.69**
Water	0.00	0.00	0.00	0.00	0.00	1.78	**1.78**
Total of 2010	**0.00**	**501.42**	**336.27**	**120.31**	**14.69**	**1.78**	**974.47**
Net Change	0.00	0.00	0.00	0.00	0.00	0.00	

4.43 WARANGAL NORTH DIVISION

4.43.1 Introduction:

Warangal North Forest Division lies in the north-western part of Warangal district between latitudes 17^0 29' 16'' and 18^0 36' 20'' N and longitudes 78^0 49' 49'' and 80^0 40' 13'' E. Geographical area of the Division is 8687.81 Km^2 which is 75.96% of the geographical area of the district. The elevation of the terrain ranges from 266 to 518 M above Mean Sea Level (MSL). The general slope of the land is towards south-east, the surplus water draining into Godavari River. Dayyam vagu is one of the important rivulets flowing in the Division and passes mostly through forest area.

Land use pattern of the Division is given in Table 4.43.1

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

Table 4.43.1: Land use Pattern

Land use	Area in SqKm	Percentage
Forest including Scrub	2062.96	23.75
Agriculture	5402.94	62.19
Land with Scrub	370.82	4.27
Fallow Lands	308.13	3.55
Grasslands	0.00	0.00
Settlements	103.8	1.19
Vegetation outside Forest	171.84	1.98
Water Bodies	267.32	3.07
Total	**8687.81**	

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

Population of the Division is 2.57 million (2011 Census), per capita forest area is 0.09 Ha and the population density is 286 persons per Km^2.

4.43.2 Recorded Forest Area:

The notified forest area of the Division is **2310.25 Km^2** which is 26.59% of the geographical area. Reserved, Protected and Un-classed forests constitute 1579.06 Km^2 (68.35%), 709.02 Km^2 (30.69%) and 22.18 Km^2 (0.95%) of the forest area respectively.

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

4.43.3 Protected Area:

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

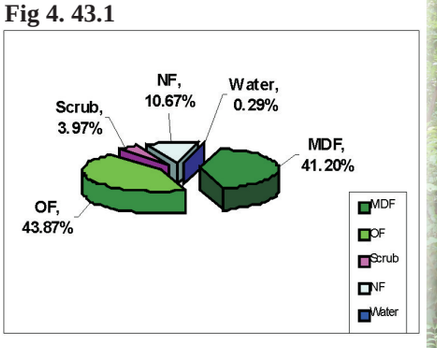
4.43.4 Community Forest Management:

There are 127 Vana Samrakshana Samities (VSSs) in the Division. 332.38 Km^2 of forest area, which is 8.95 % of the notified forests, is under the management of VSSs.

4.43.5 Forest Cover:

The forest cover in the Division based on the interpretation of IRS P6 LISS III 2010 data (Oct/Dec 2010) is **1965.16 Km^2** which is 22.61% of the geographical area. In terms of the forest canopy density classes the Division has 951.75 Km^2 of Moderately Dense Forests and 1013.41 Km^2 Open Forests. The area of the Scrub is 91.80 Km^2, Non-Forests 246.56 Km^2 and Water Bodies 6.73 Km^2. The distribution of the forest cover of the Division is shown in Fig 4.43.1

Fig 4. 43.1



4.43.6 Change in Forest Cover:

The Satellite images of 2009 and 2010 seasons are shown in Figs. 4.43.2 and 4.43.3 respectively and the changes between this period are shown on the image of 2010.

Comparison of the current forest cover with that of previous assessment year shows a **negative change** in forest cover of **320.92 Ha** and **positive change** of **53.04 Ha**. The forest cover change matrix given in Table 4.43.2 reveals that there is a decrease of 134.88 Ha of moderately dense forest and 133.00 Ha of open forest.

The positive change 53.04 Ha is on account of growth in raised plantations. The negative change (including scrub) of 83.53 Ha is on account of clearance of jungle growth for raising of plantations and 272.55 Ha 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 encroachment is taken as loss of forest cover. Hence the **net loss of forest cover** in the Division is **272.55 Ha**.

Fig 4.43.2

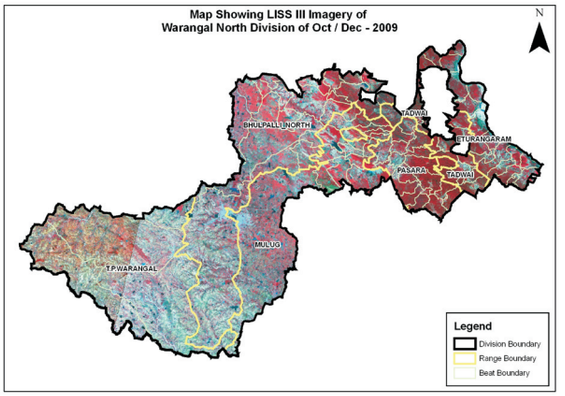
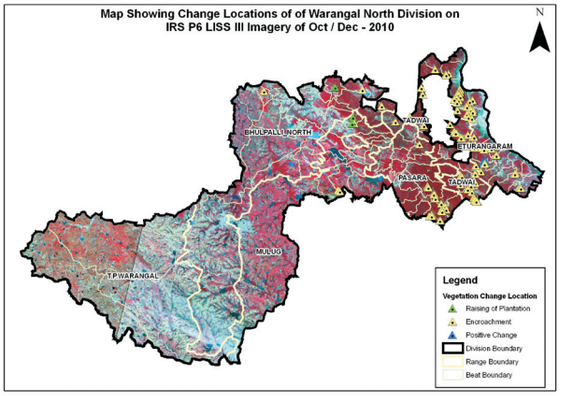


Fig 4.43.3



There are 84 Beats in the Division. Negative changes in forest cover are noticed in 30 Beats and positive change in 1 Beat. There are no changes in the remaining 53 Beats.

Details of forest cover changes in the 31 Beats mentioned above are shown in Table 4.43.3.

Table 4.43.2: Forest Cover change matrix (Area in Km²)

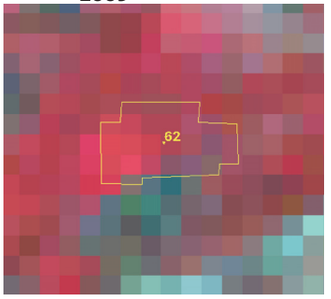
2009	2010						Total of 2009
	VDF	MDF	OF	Scrub	NF	WB	
Very Dense Forest	0.00	0.00	0.00	0.00	0.00	0.00	**0.00**
Moderately Dense Forest	0.00	951.75	0.23	0.28	0.84	0.00	**953.10**
Open Forest	0.00	0.00	1012.65	0.44	1.65	0.00	**1014.74**
Scrub	0.00	0.00	0.17	91.08	0.12	0.00	**91.37**
Non-Forest	0.00	0.00	0.36	0.00	243.95	0.00	**244.31**
Water	0.00	0.00	0.00	0.00	0.00	6.73	**6.73**
Total of 2010	**0.00**	**951.75**	**1013.41**	**91.80**	**246.56**	**6.73**	**2310.25**
Net Change	0.00	-1.35	-1.33	0.43	2.25	0.00	

Table 4.43.3: List of Beats with negative change in Forest Cover (Area in Ha)

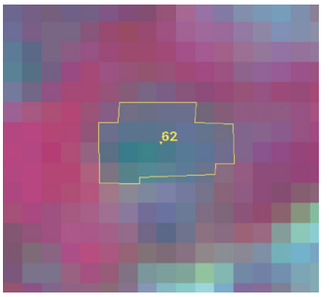
Beat	VDF	MDF	OF	Scrub	NF	WB	Total	Net Change	Encroachments
BHUPALAPALLI NORTH RANGE									
Andukthanda	0.00	235.40	460.60	82.24	180.61	0.00	958.85	-6.39	6.39
Dudekulapalli	0.00	1356.79	1164.69	26.01	68.85	0.01	2616.35	-2.04	2.04
Kamalapur	0.00	1017.76	2186.94	142.31	374.21	7.26	3728.48	-45.46	0.00
Rampur N	0.00	468.99	1321.58	77.13	172.18	0.00	2039.88	-1.33	1.33
Total	**0.00**	**3078.94**	**5133.81**	**327.69**	**795.85**	**7.27**	**9343.56**	**-55.22**	**9.76**
ETURANAGARAM RANGE									
Bhupathipur	0.00	1553.78	1217.16	35.74	89.39	1.22	2897.29	-1.11	1.11
Domeda	0.00	526.35	1929.43	151.34	302.28	0.00	2909.40	-2.63	2.63
Eturnagaram	0.00	782.44	876.21	99.90	293.20	0.00	2051.75	-1.84	1.84
Gurvella	0.00	1419.84	904.67	50.28	386.78	23.47	2785.04	-4.04	4.04
Komatpalli	0.00	439.44	1307.19	181.25	817.14	4.18	2749.20	46.45	6.59
Mangapet	0.00	224.24	1225.18	156.86	352.65	0.00	1958.93	-47.26	47.26
Puredpalli	0.00	1263.36	1721.78	219.09	452.26	0.01	3656.50	-4.44	4.44
Rampur Mulakatta	0.00	640.75	1390.47	71.20	326.97	14.74	2444.13	-1.70	1.70
Roheer	0.00	1597.63	1488.80	120.60	605.28	94.02	3906.33	-29.09	29.09
Salpak	0.00	1710.88	1899.00	97.29	291.49	18.13	4016.79	-23.13	23.13
Thimmampet	0.00	930.55	2055.97	201.14	1116.96	10.44	4315.06	-1.44	1.44
Tondyal laxmipur	0.00	1208.48	1605.51	80.56	116.22	0.01	3010.78	-3.39	3.39
Total	**0.00**	**12297.74**	**17621.37**	**1465.25**	**5150.62**	**166.22**	**36701.20**	**-73.62**	**126.66**
MULUGU RANGE									
Mulugu	0.00	172.54	395.06	136.52	203.80	0.01	907.93	-3.60	3.60
Narayanpur	0.00	803.14	988.78	89.81	348.09	5.02	2234.84	-41.04	2.97
Total	**0.00**	**975.68**	**1383.84**	**226.33**	**551.89**	**5.03**	**3142.77**	**-44.64**	**6.57**
PASARA RANGE									
Alliguda N	0.00	2202.63	527.86	33.53	114.54	0.00	2878.56	-1.80	1.80
Alliguda S	0.00	2574.20	623.04	14.95	60.87	3.45	3276.51	-3.54	3.54
Bandal	0.00	5076.76	1122.29	40.57	88.41	0.00	6328.02	-19.81	19.81
Lingal	0.00	2462.40	1737.36	121.49	471.03	2.15	4794.43	-22.52	22.52
Motlaguda	0.00	2322.30	2008.45	71.44	143.92	0.00	4546.11	-0.93	0.93
Total	**0.00**	**14638.29**	**6019.00**	**281.98**	**878.77**	**5.60**	**21823.63**	**-48.60**	**48.60**
TADWAI RANGE									
Beerelli	0.00	1993.67	2024.01	301.70	564.29	18.98	4902.65	-21.40	21.40
Chinnaboinapally	0.00	1396.86	968.78	97.74	384.51	0.00	2847.89	-10.03	10.03
Damervai	0.00	996.34	1159.18	68.05	133.20	0.00	2356.76	-0.73	0.73
Katapur	0.00	1147.73	773.55	64.76	81.80	2.31	2070.15	-5.19	5.19
Oorattam	0.00	4603.03	3700.77	210.32	387.18	25.20	8926.50	-9.42	9.42
Rampur New	0.00	1179.94	877.18	75.47	64.34	0.00	2196.92	-19.46	19.46
Shahpalli	0.00	2093.22	1478.43	87.80	265.78	21.91	3947.14	-13.57	13.57
Souledu	0.00	2260.94	931.55	4.48	4.76	0.00	3201.73	-1.16	1.16
Total	**0.00**	**15671.73**	**11913.45**	**910.32**	**1885.86**	**68.40**	**30449.74**	**-80.96**	**80.96**
Grand Total	**0.00**	**46662.38**	**42071.47**	**3211.57**	**9262.99**	**252.52**	**101460.90**	**-303.04**	**272.55**

Satellite Images

2009



2010



Longitude	80.45881^0 E
Latitude	18.25158^0 N
Area in Ha	1.27
Change	OF to NF
Compt No	250
Beat	Tondyal Laxmipur
Range	Eturagaram
Division	Warangal North

Warangal Circle

4.44 WARANGAL SOUTH DIVISION

4.44.1 Introduction:

Warangal South Forest Division lies in the south-eastern part of Warangal district between latitudes 17^0 19' 05'' and 18^0 07' 04'' N and longitudes 79^0 35' 32'' and 80^0 18' 32'' E. Geographical area of the Division is 3,618 Km^2 which is 29.3% of the geographical area of the district. The Division is having an altitude of 420 to 658 M and the plains having an altitude of 302 M above MSL.

Land use pattern of the Division is given in Table 4.44.1

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

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

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

Table 4.44.1: Land use Pattern

Land use	Area in SqKm	Percentage
Forest including Scrub	**815.16**	22.53
Agriculture	2296.34	63.47
Land with Scrub	174.21	4.81
Fallow Lands	77.86	2.15
Grasslands	0.00	0.00
Settlements	13.11	0.36
Vegetation outside Forest	94.3	2.61
Water Bodies	147.15	4.07
Total	**3618.13**	

4.44.2 Recorded Forest Area:

The notified forest area of the Division is **1174 Km^2** which is 32.4% of the geographical area. Reserved, Protected and Un-classed forests constitute 572.8 Km^2 (48.79%), 598 Km^2 (51.03%) and 2.11 Km^2 (0.18%) of the forest area respectively.

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

4.44.3 Protected Area:

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

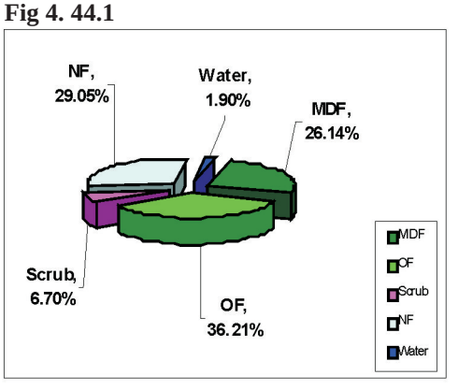
4.44.4 Community Forest Management:

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

4.44.5 Forest Cover:

The forest cover in the Division based on the interpretation of IRS P6 LISS III 2010 data (Oct/Dec 2010) is **732.42 Km^2** which is 20.24% of the geographical area. In terms of the forest canopy density classes the Division has 307.03 Km^2 of Moderately Dense Forests and 425.39 Km^2 of Open Forests. The area of the Scrub is 78.76 Km^2, Non-Forest 341.18 Km^2 and Water Bodies 22.29 Km^2. The distribution of the forest cover of the Division is shown in Fig 4.44.1

Fig 4. 44.1



4.44.6 Change in Forest Cover:

The Satellite images of 2009 and 2010 seasons are shown in Figs. 4.44.2 and 4.44.3 respectively and the changes between this period are shown on the image of 2010.

Comparison of the current forest cover with that of previous assessment year shows a **negative change in forest cover of 271.73 Ha**. The forest cover change matrix given in Table 4.44.2 reveals that there is a decrease of 118.85 Ha of moderately dense forest and 152.88 Ha of open forest.

The entire negative change (including scrub) of 289.97 Ha is on account of encroachments. Therefore the **net loss of forest cover** is **289.97 Ha**.

Fig 4. 44.2

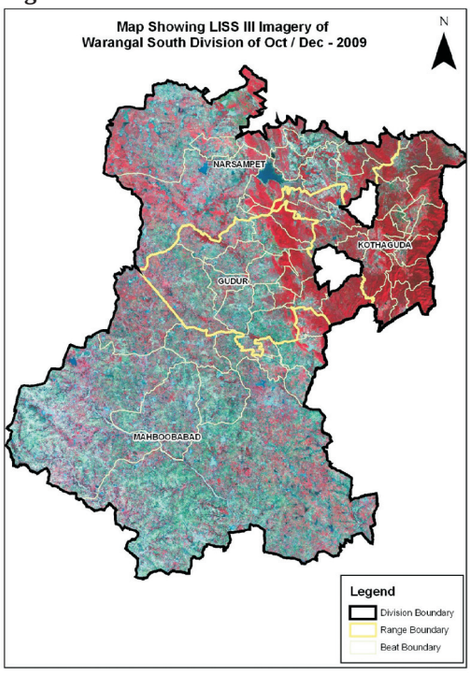
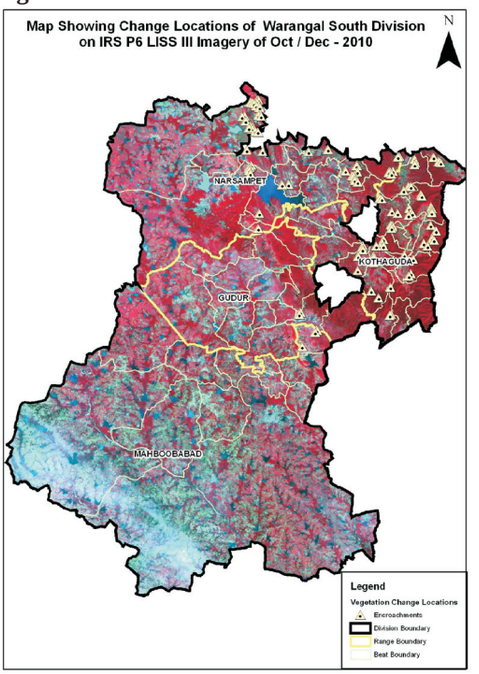


Fig 4. 44.3



There are 56 Beats in the Division. Negative changes in forest cover are noticed in 24 Beats. There are no changes in the remaining 32 Beats.

Details of forest cover changes in the 24 Beats mentioned above are shown in Table 4.44.3

Table 4.44.2: Forest Cover change matrix (Area in Km²)

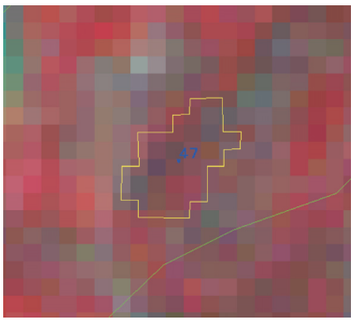
2009	2010						Total of 2009
	VDF	MDF	OF	Scrub	NF	WB	
Very Dense Forest	0.00	0.00	0.00	0.00	0.00	0.00	**0.00**
Moderately Dense Forest	0.00	307.03	0.15	0.62	0.42	0.00	**308.22**
Open Forest	0.00	0.00	425.24	0.38	1.30	0.00	**426.92**
Scrub	0.00	0.00	0.00	77.76	0.03	0.00	**77.79**
Non-Forest	0.00	0.00	0.00	0.00	339.43	0.00	**339.43**
Water	0.00	0.00	0.00	0.00	0.00	22.29	**22.29**
Total of 2010	**0.00**	**307.03**	**425.39**	**78.76**	**341.18**	**22.29**	**1174.65**
Net Change	0.00	-1.19	-1.53	0.97	1.75	0.00	

Table 4.44.3: List of Beats with negative change in Forest Cover (Area in Ha)

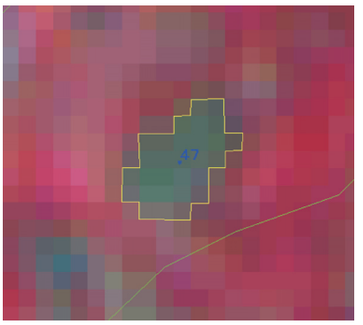
Beat	VDF	MDF	OF	Scrub	NF	WB	Total	Net Change	Encroachments
GUDUR RANGE									
Matwada	0.00	487.45	1240.71	124.28	383.14	2.31	2237.89	-6.80	6.80
Otla	0.00	1244.49	1198.41	163.19	371.35	4.91	2982.35	-2.27	2.27
Total	**0.00**	**1731.94**	**2439.12**	**287.47**	**754.49**	**7.22**	**5220.24**	**-9.07**	**9.07**
KOTHAGUDA RANGE									
Bavargonda	0.00	639.93	646.58	82.84	435.41	7.91	1812.67	-1.31	1.31
Buthulapally	0.00	177.48	1651.00	301.11	965.32	9.24	3104.15	-5.37	5.37
Gudipaddu	0.00	1705.11	362.85	41.92	365.29	4.36	2479.53	-11.67	11.67
Gurjalemote	0.00	1203.35	689.53	32.40	142.88	3.39	2071.55	-3.53	3.53
Jangalapally	0.00	1826.97	1242.98	141.84	304.16	1.29	3517.24	-12.35	12.35
Kamaram	0.00	925.21	2322.66	95.29	517.43	16.99	3877.58	-9.14	9.14
Komatlaguda	0.00	1443.75	841.58	98.44	460.07	7.35	2851.19	-19.31	19.31
Madaguda	0.00	1049.03	1234.85	167.89	639.17	6.38	3097.32	-4.50	4.50
Mamidiguda	0.00	975.47	1092.79	68.47	464.19	2.37	2603.29	-8.97	8.97
Marriguda	0.00	777.81	1511.90	170.46	404.80	5.02	2869.99	-17.20	17.20
Putlabhupathi	0.00	912.49	760.94	118.13	265.17	6.82	2063.55	-13.22	13.22
Thirmalgandi	0.00	87.18	1187.11	140.62	414.70	6.63	1836.24	-1.98	1.98
Total	**0.00**	**11723.78**	**13544.77**	**1459.41**	**5378.59**	**77.75**	**32184.30**	**-108.55**	**108.55**
MAHBOOBABAD RANGE									
Kongarigidda	0.00	446.18	1151.97	234.81	687.17	7.94	2528.07	-12.28	12.28
Total	**0.00**	**446.18**	**1151.97**	**234.81**	**687.17**	**7.94**	**2528.07**	**-12.28**	**12.28**
NARSAMPET RANGE									
Ashoknagar	0.00	46.36	699.54	126.14	913.43	59.78	1845.25	-17.96	17.96
Budharaopet	0.00	27.79	38.71	10.04	33.85	0.00	110.39	-1.76	1.76
Dabeerpet	0.00	488.24	1464.42	262.37	744.31	4.72	2964.06	-3.76	3.76
Govindapur	0.00	1130.97	1000.65	344.05	1464.98	131.55	4072.20	-101.99	101.99
Inchaguda(N)	0.00	93.44	656.82	88.49	879.30	1.48	1719.53	-2.99	2.99
Inchaguda(S)	0.00	16.26	521.01	208.61	1686.64	108.75	2541.27	-2.95	2.95
Musmi-1	0.00	515.97	1006.17	119.51	616.77	13.31	2271.73	-17.12	17.12
Pakhal	0.00	544.75	1145.17	324.63	1179.62	1500.23	4694.40	-4.90	4.90
Ponugondla	0.00	922.22	1170.30	42.15	67.18	0.01	2201.86	-6.64	6.64
Total	**0.00**	**3786.00**	**7702.79**	**1525.99**	**7586.08**	**1819.83**	**22420.69**	**-160.07**	**160.07**
Grand Total	**0.00**	**17687.90**	**24838.65**	**3507.68**	**14406.33**	**1912.74**	**62353.30**	**-289.97**	**289.97**

Satellite Images

2009



2010



Longitude	80.13857^0 E
Latitude	17.98144^0 N
Area in Ha	1.607
Change	OF to NF
Compt No	763
Beat	Musmi-1
Range	Narsampet
Division	Warangal South

4.45 WARANGAL WLM DIVISION

4.45.1 INTRODUCTION:

Warangal WLM Forest Division lies in the north-western and south-eastern parts of Warangal district between latitudes 17^0 29' 16'' and 18^0 36' 20'' N and longitudes 78^0 49' 49'' and 80^0 40' 13'' E. Geographical Area of the Division is 540 Km^2.

Land use pattern of the Division is given in Table 4.45.1.

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

Population of the Division is 0.039 million (2011 Census), per capita forest area is 1.38 Ha and the population density is 72 persons per Km^2.

Table 4.45.1: Land use Pattern

Land use	Area in SqKm	Percentage
Forest including Scrub	511.55	94.72
Agriculture	6.86	1.27
Land with Scrub	5.41	1.00
Fallow Lands	0.19	0.04
Grasslands	0.00	0.00
Settlements	0.00	0.00
Vegetation outside Forest	14.99	2.78
Water Bodies	1.04	0.19
Total	**540.04**	

4.45.2 RECORDED FOREST AREA:

The notified forest area of the Division is **538.55 Km^2**.

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

4.45.3 PROTECTED AREA:

The Division consists of two Protected Areas - Eturnagaram and Pakhal wildlife Sanctuaries.

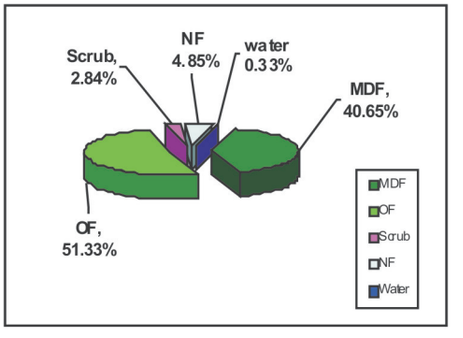
4.45.4 COMMUNITY FOREST MANAGEMENT:

There are 43 Vana Samrakshana Samities (VSSs) in the Division. An area of 100.67 Km^2 forest area which is 18.69% of the notified forests is under the management of the VSSs.

4.45.5 FOREST COVER:

The forest cover in the Division based on the interpretation of IRS P6 LISS III 2010 data (Oct 2010) is **495.35 Km^2** which is 91.72% of the geographical area. In terms of the forest canopy density classes the Division has 218.91 Km^2 of Moderately Dense Forests and 276.44 Km^2 of Open Forests. The area of the Scrub is 15.30 Km^2, Non-Forests 26.13 Km^2 and Water Bodies 1.77 Km^2. The distribution of the forest cover of the Division is shown in Fig 4.45.1

Fig 4.45.1



4.45.6 CHANGE IN FOREST COVER:

The Satellite images of 2009 and 2010 seasons are shown in Figs. 4.45.2 and 4.45.3 respectively and the changes between this period are shown on the image of 2010.

Comparison of the current forest cover with that of previous assessment year shows a **negative change** in forest cover of **94.63 Ha**. The forest cover change matrix given in Table 4.45.2 reveals that there is a decrease of 16.73 Ha of moderately dense forest and 77.90 Ha of open forest.

The entire negative change (including scrub) of 103.05 Ha is on account of encroachments which is a loss of forest cover. Therefore, the **net loss of forest cover** in this Division is **103.05 Ha**.

Fig 4. 45.2

Fig 4. 45.3

There are 30 Beats in the Division. Negative changes in forest cover are noticed in 11 Beats.There are no changes in the remaining 19 Beats.

Details of forest cover changes in these 11 Beats are shown in Table 4.45.3.

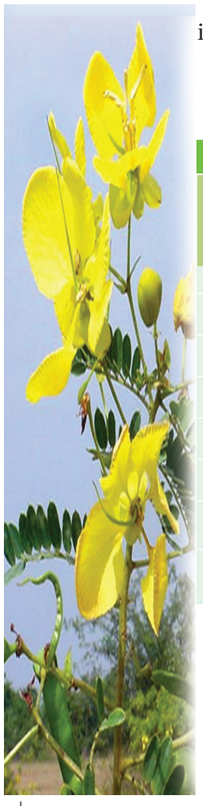


Table 4.45.2: Forest Cover change matrix (Area in Km^2)

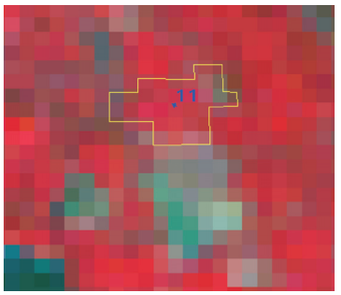
2009	2010						Total of 2009
	VDF	MDF	OF	Scrub	NF	WB	
Very Dense Forest	0.00	0.00	0.00	0.00	0.00	0.00	**0.00**
Moderately Dense Forest	0.00	218.91	0.03	0.03	0.10	0.00	**219.07**
Open Forest	0.00	0.00	276.41	0.06	0.75	0.00	**277.22**
Scrub	0.00	0.00	0.00	15.21	0.05	0.00	**15.26**
Non-Forest	0.00	0.00	0.00	0.00	25.23	0.00	**25.23**
Water	0.00	0.00	0.00	0.00	0.00	1.77	**1.77**
Total of 2010	**0.00**	**218.91**	**276.44**	**15.30**	**26.13**	**1.77**	**538.55**
Net Change	0.00	-0.16	-0.78	0.04	0.90	0.00	

Table 4.45.3: List of Beats with negative change in Forest Cover (Area in Ha)

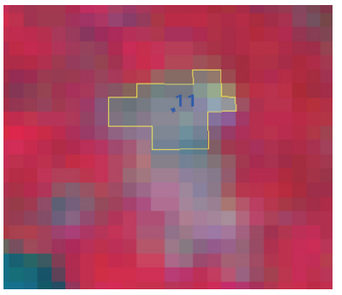
Beat	VDF	MDF	OF	Scrub	NF	WB	Total	Net Change	Encroachments
ETURUNAGARAM RANGE									
Kondai(s)	0.00	794.01	499.46	10.49	9.05	17.23	1330.24	-1.50	1.50
Mallial(s)	0.00	1241.94	754.72	78.22	328.10	17.94	2420.92	-1.70	1.70
Total	**0.00**	**2035.95**	**1254.18**	**88.71**	**337.15**	**35.17**	**3751.16**	**-3.20**	**3.20**
KOTHAGUDA-I RANGE									
Ankannaguda	0.00	468.80	694.17	11.17	20.92	2.50	1197.56	-1.70	1.70
Kondapur	0.00	161.56	307.19	13.67	15.50	0.00	497.92	-6.99	6.99
Medapally	0.00	580.42	930.12	166.02	435.01	5.02	2116.59	-63.95	63.95
Ootai	0.00	455.66	2013.51	136.55	87.12	0.00	2692.84	-6.75	6.75
Total	**0.00**	**1666.44**	**3944.99**	**327.41**	**558.55**	**7.52**	**6504.91**	**-79.39**	**79.39**
KOTHAGUDA-II RANGE									
Doravarivempally	0.00	584.63	1771.17	56.58	88.86	0.00	2501.24	-7.71	7.71
Karlai	0.00	420.03	1483.68	95.02	518.43	13.79	2530.95	-3.79	3.79
Ootla	0.00	491.20	730.19	21.91	30.82	3.75	1277.87	-0.77	0.77
Total	**0.00**	**1495.86**	**3985.04**	**173.51**	**638.11**	**17.54**	**6310.06**	**-12.27**	**12.27**
TADWAI RANGE									
Dodla	0.00	1521.15	795.60	43.76	20.02	16.43	2396.96	-2.36	2.36
Heerapur	0.00	608.38	616.47	45.78	17.08	0.00	1287.71	-5.83	5.83
Total	**0.00**	**2129.53**	**1412.07**	**89.54**	**37.10**	**16.43**	**3684.67**	**-8.19**	**8.19**
Grand Total	**0.00**	**7327.78**	**10596.28**	**679.17**	**1570.91**	**76.66**	**20250.80**	**-103.05**	**103.05**

Satellite Images

2009



2010



Longitude	80.1043^0 E
Latitude	18.12239^0 N
Area in Ha	1.702
Change	OF to NF
Compt No	0
Beat	Ankannaguda
Range	Kothaguda-I
Division	Warangal WLM

Prevent cruelty to animal kept in human societies and protect them from suffering.
~ Earth charter & Gandhi page 59

Tirupathi Circle

4.46 CHITTOOR EAST WL DIVISION

4.46.1 Introduction:

Chittoor East WL Forest Division lies in the south of Andhra Pradesh and eastern part of Chittoor District between latitudes 13^0 1' 7.32" and 13^0 55'28.56" N and longitudes 78^0 46' 50.88"and 80^0 03' 10.44" E. The Geographical Area of the Division is 6,769.18 Km^2 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, Tumbur kona, Kalangi, Arani and Ponnai.

Land use pattern of the Division is given in Table 4.46.1

The climate of this Division is healthy and pleasant. The temperatures ranging from 16^0C to 46^0C 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), 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 $Km^{2.}$

Table 4.46.1: Land use Pattern

Land use	Area in SqKm	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
Total	**6769.18**	

4.46.2 Recorded Forest Area:

The notified forest area of the Division is **2452.08 Km^2** which is 36.22% of the geographical area. Reserved and Protected Forests constitute 1976.68 Km^2 (80.61%) and 475.4 Km^2 (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.

4.46.3 Protected Area:

There is no Protected Area in the Division.

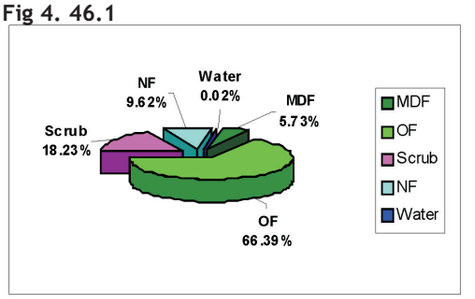
4.46.4 Community Forest Management:

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

4.46.5 Forest Cover:

The forest cover in the Division based on the interpretation of IRS P6 LISS III 2010 data (Jan 2011) is **1443.45 Km^2** which is 21.32% of the Geographical area. In terms of the forest canopy density classes the Division has 0.02 Km^2 of Very Dense Forest, 114.71 Km^2 of Moderately Dense Forest and 1328.72 Km^2 of Open Forest. The area of the Scrub is 364.81 Km^2, Non-Forest 192.60 Km^2 and Water Bodies 0.45 Km^2. The Distribution of the forest cover of the Division is shown in fig 4.46.1.

Fig 4. 46.1



4.46.6 Change in Forest Cover:

The satellite images of 2009 and 2010 are shown in Figs 4.46.2 & 4.46.3 respectively and the changes between this period are shown on the image of 2010.

Comparison of the current forest cover with that of previous assessment year shows **no negative change**. The forest cover change matrix given in Table 4.46.2 reveals that there is a decrease in forest cover of 1.66 Ha in scrub.

The negative change in scrub of 1.66 Ha is on account of encroachment. Therefore the **net loss of forest cover is 1.66 Ha**.

Fig 4. 46.2

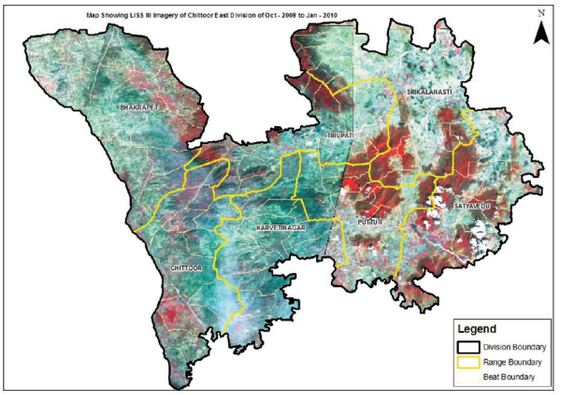
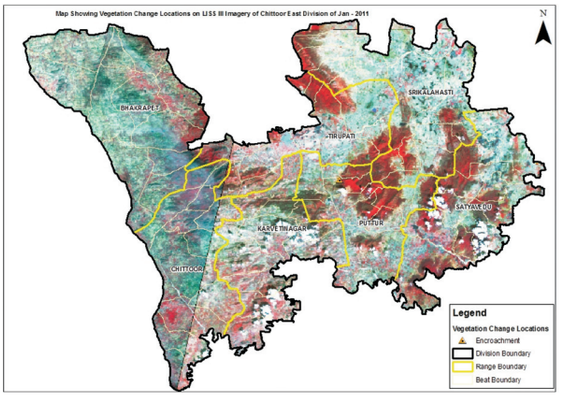


Fig 4. 46.3



There are 78 Beats in the Division. Negative change in forest cover is noticed in 1 Beat only, i.e., Vadmalpet. There is change in the remaining 77 Beats.

Details of forest cover changes in the 1 Beat mentioned above, is shown in Table 4.46.3.

Table 4.46.2: Forest Cover change matrix (Area in Km^2)

2009	2010						Total of 2009
	VDF	MDF	OF	Scrub	NF	WB	
Very Dense Forest	0.02	0.00	0.00	0.00	0.00	0.00	**0.02**
Moderately Dense Forest	0.00	114.71	0.00	0.00	0.00	0.00	**114.71**
Open Forest	0.00	0.00	1328.72	0.00	0.00	0.00	**1328.72**
Scrub	0.00	0.00	0.00	364.81	0.02	0.00	**364.83**
Non-Forest	0.00	0.00	0.00	0.00	192.58	0.00	**192.58**
Water	0.00	0.00	0.00	0.00	0.00	0.45	**0.45**
Total of 2010	**0.02**	**114.71**	**1328.72**	**364.81**	**192.6**	**0.45**	**2001.31**
Net Change	0.00	0.00	0.00	-0.02	0.02	0.00	

Table 4.46.3: List of Beats with negative change in Forest Cover (Area in Ha)

Beat	VDF	MDF	OF	Scrub	NF	WB	Total	Net Change	Encroachments
Puttur RANGE									
Vadamalpet	0.00	459.45	2495.00	196.76	119.53	0.00	3270.74	-1.66	1.66
Total	**0.00**	**459.45**	**2495.00**	**196.76**	**119.53**	**0.00**	**3270.74**	**-1.66**	**1.66**

Tirupathi Circle

4.47 TIRUPATI WLM DIVISION

4.47.1 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 13^0 36' 18'' and 13^0 56' 55.68'' N and longitudes 79^0 07' 51.96'' and 79^0 30' 18.36" E. Geographical area of the Division is 755.17 Km^2.

Land use pattern of the Division is given in Table 4.47.1

The climate of this Division is generally dry with temperatures ranging from 19^0C to 40^0C 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^2.

Table 4.47.1: Land use Pattern

Land use	Area in SqKm	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
Total	**755.17**	

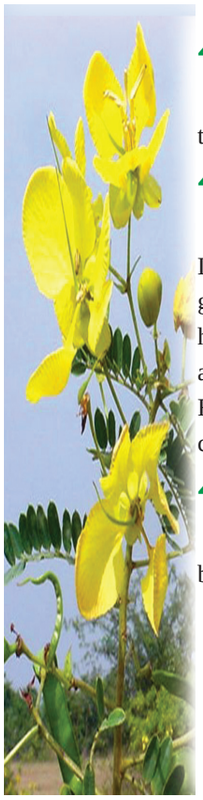
4.47.2 Recorded Forest Area:

The notified forest area of the Division is **714.33 Km^2** 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.

4.47.3 Protected Area:

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



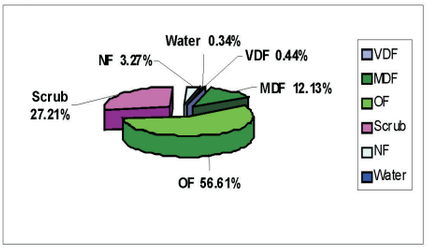
4.47.4 Community Forest Management:

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

4.47.5 Forest Cover:

The forest cover in the Division based on the interpretation of IRS P6 LISS III 2010 data (Feb 2011) is **494.21 Km^2** which is 65.44 % of the geographical area. In terms of the forest canopy density classes the Division has 3.16 Km^2 of Very Dense Forests, 86.64 Km^2 of Moderately Dense Forests and 404.41 Km^2 of Open Forest. The area of the Scrub is 194.35 Km^2, Non-Forests 23.35 Km^2 and water Bodies 2.41 Km^2. The distribution of the forest cover of the Division is shown in Fig 4.47.1.

Fig 4. 47.1



4.47.6 Change in Forest Cover:

The satellite images of 2009 and 2010 seasons are shown in Figs 4.47.2 & 4.47.3 respectively and the changes between this period are shown on the image of 2010.

Comparison of the current forest cover with that of previous assessment year shows a **negative change** in forest cover of **2.99 Ha**. The forest cover change matrix given in Table 4.47.2 reveals that there is a decrease of 2.99 Ha of open forest.

The total negative change of 2.99 Ha is on account of diversion of forestland to AP Tourism Department which will be compensated. Therefore the **net loss of forest cover is Nil**.

Fig 4.47.2

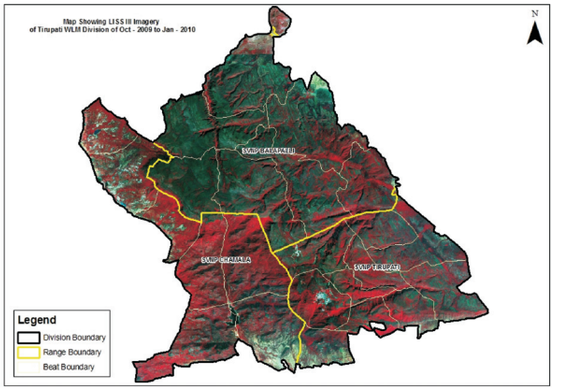
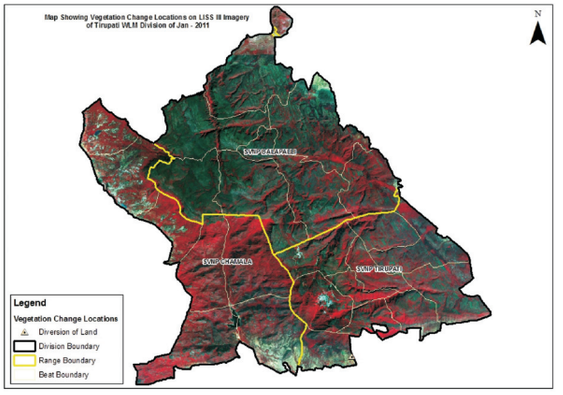


Fig 4.47.3



There are 25 Beats in the Division. Negative changes in forest cover is seen in only 1 Beat and there are no changes in the remaining 24 Beats.

Details of forest cover changes in 1 Beat mentioned above is shown in Table 4.47.3.

Table 4.47.2: Forest Cover change matrix (Area in Km^2)

2009	2010						Total of 2009
	VDF	MDF	OF	Scrub	NF	WB	
Very Dense Forest	3.16	0.00	0.00	0.00	0.00	0.00	**3.16**
Moderately Dense Forest	0.00	86.64	0.00	0.00	0.00	0.00	**86.64**
Open Forest	0.00	0.00	404.41	0.03	0.00	0.00	**404.44**
Scrub	0.00	0.00	0.00	194.32	0.00	0.00	**194.32**
Non-Forest	0.00	0.00	0.00	0.00	23.35	0.00	**23.35**
Water	0.00	0.00	0.00	0.00	0.00	2.41	**2.41**
Total of 2010	**3.16**	**86.64**	**404.41**	**194.35**	**23.35**	**2.41**	**714.32**
Net Change	0.00	0.00	-0.03	0.03	0.00	0.00	

Table 4.47.3: List of Beats with negative change in Forest Cover (Area in Ha)

Beat	VDF	MDF	OF	Scrub	NF	WB	Total	Net Change	Encroachments
Tirupati Range									
Perumallapalli	20.93	423.89	876.31	439.43	67.79	0.00	1828.35	-2.99	0.00
Total	**20.93**	**423.89**	**876.31**	**439.43**	**67.79**	**0.00**	**1828.35**	**-2.99**	**0.00**

Tirupathi Circle

4.48 RAJAMPET WL DIVISION

4.48.1 Introduction:

Rajampet WL Forest Division lies in the south-eastern part of Kadapa district between latitudes 13^0 46' 45'' and 14^0 23' 35'' N and longitudes 78^0 44' 44'' and 79^0 28' 22'' E. Geographical area of the Division is 3,027 Km^2 which is 19.71% of the geographical area of the district. The Division is having an altitude of 378.7 M. The rivers Penna, Chitravathi, Kundu, Papaghni, Sagileru, Mandvya, Gunjaneru and Cheyyeru fall in this Division.

Land use pattern of the Division is given in Table 4.48.1

The climate of this Division is generally dry with temperatures ranging from 25^0 C to 40^0 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 ferrugenous 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 Division area and are under cultivation. These soils have a low nutrient status. The minerals like Barytes, 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^2.

Table 4.48.1: Land use Pattern

Land use	Area in SqKm	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
Total	**3027.00**	

4.48.2 Recorded Forest Area:

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

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

4.48.3 Protected Area:

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

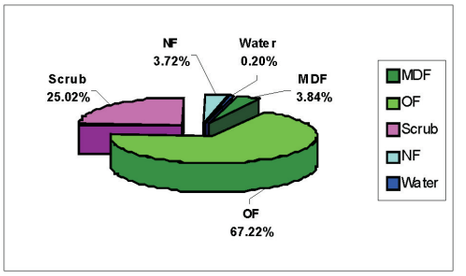
4.48.4 Community Forest Management:

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

4.48.5 Forest Cover:

The forest cover in the Division is based on the interpretation of IRS P6 LISS III 2010 data (Jan 2011) is 1031.74 Km^2 which is 34.11% of the geographical area. In terms of the forest canopy density classes the Division has 55.71 Km^2 of Moderately Dense Forest and 976.03 Km^2 of Open Forest. The area of the Scrub is 363.21 Km^2, Non-Forest 54.08 Km^2 and Water Bodies 2.91 Km^2.The distribution of the forest cover of the Division is shown in Fig 4.48.1.

Fig 4. 48.1



4.48.6 Change in Forest Cover:

The satellite images of 2009 and 2010 seasons are shown in Figs 4.48.2 & 4.48.3 respectively and the changes between this period are shown on the image of 2010.

Comparison of the current forest cover with that of previous assessment year **does not show any change in the forest cover**. The Forest cover change matrix given in Table 4.48.2 reveals that there has been an **increase of 1.32 Ha of scrub**.

The positive change of 11.68 Ha is on account of raising of plantations. The negative change including scrub loss is 10.36 Ha on account of clearance of jungle growth for raising of plantations. As raising of plantations is a forest management intervention the same is not considered as loss of forest cover. Therefore there is **no net loss of forest cover** in the Division.

Fig 4. 48.2

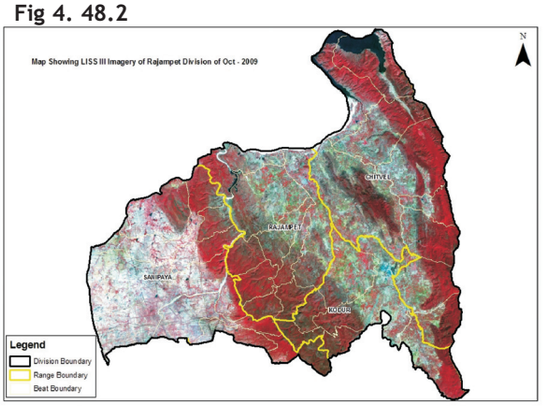
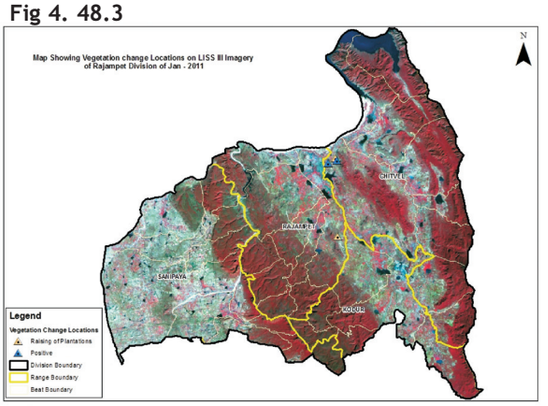


Fig 4. 48.3



There are 32 Beats in the Division. Both positive and negative changes in forest cover are noticed in 1 Beat only and only positive change is noticed in 1 Beat. There are no changes in the remaining 29 Beats.

Details of forest cover changes in the 2 Beats mentioned above are shown in Table 4.48.3.

Table 4.48.2: Forest Cover change matrix (Area in Km²)

2009	2010						Total of 2009
	VDF	MDF	OF	Scrub	NF	WB	
Very Dense Forest	0.00	0.00	0.00	0.00	0.00	0.00	**0.00**
Moderately Dense Forest	0.00	55.71	0.00	0.00	0.00	0.00	**55.71**
Open Forest	0.00	0.00	976.03	0.00	0.00	0.00	**976.03**
Scrub	0.00	0.00	0.00	363.09	0.10	0.00	**363.19**
Non-Forest	0.00	0.00	0.00	0.12	53.98	0.00	**54.10**
Water	0.00	0.00	0.00	0.00	0.00	2.91	**2.91**
Total of 2010	**0.00**	**55.71**	**976.03**	**363.21**	**54.08**	**2.91**	**1451.94**
Net Change	0.00	0.00	0.00	0.02	-0.02	0.00	

Table 4.48.3: List of Beats with negative change in Forest Cover (Area in Ha)

Beat	VDF	MDF	OF	Scrub	NF	WB	Total	Net Change	Encroa-chments
CHITVEL RANGE									
Chitvel	0.00	792.13	5795.53	1785.32	152.00	0.00	8524.98	8.96	0.00
Total	**0.00**	**792.13**	**5795.53**	**1785.32**	**152**	**0.00**	**8524.98**	**8.96**	**0.00**
RAJAMPET RANGE									
Annasamudram	0.00	44.7	2650.31	1053.13	114.32	0.62	3863.08	-7.64	0.00
Total	**0.00**	**44.7**	**2650.31**	**1053.13**	**114.32**	**0.62**	**3863.08**	**-7.64**	**0.00**
Grand Total	**0.00**	**836.83**	**8445.84**	**2838.45**	**266.32**	**0.62**	**12388.06**	**1.32**	**0.00**

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 1000 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 Nallamalais 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 Flamingos and Grey Pelicans, the estuaries of river Godavari and Krishna support rich mangrove forests with Fishing Cat and Otters as key-stone 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 tumbuggia, 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 27 Protected Areas – 20 Wildlife Sanctuaries, 6 National Parks and 2 Tiger Reserves i.e. Nagarjuna Sagar – Srisailam Tiger Reserve (NSTR), the biggest Tiger Reserve of India and Kawal Tiger Reserve in Adilabad District – the latest to be notified as Tiger Reserve in A.P. Out of 63814 Km^2 of notified forest area, 15280.92 Km^2 is included in the PA network, covering an area of about 23.9% of the notified forests and 5.53% 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 2010 data is 10043.63 Km^2, i.e. 3.7% of the Geographical area. In terms of the forest canopy density classes the PA Network has 208.37 Km^2 of Very Dense Forest, 3927.50 Km^2 of Moderately Dense Forest and 5907.76 Km^2 of Open Forests. The area of the Scrub included is 2919.79 Km^2, Non-Forest 1371.99 Km^2 and Water Bodies 945.47 Km^2.

Comparison of the forest cover of 2010 with that of 2009 shows a net loss of 4.31 Km^2 of forest cover. Maximum habitat loss of 1.56 Km^2 has occurred in Kinnerasani Wildlife Sanctuary and the least loss of 0.03 Km^2 in Sri Venkateswara National Park. There is no loss of habitat (forest cover) in the remaining 18 WLSs.

Protected Area wise forest cover in different forest canopy density classes along with the changes compared to 2009 assessment is given in **Table 5.1.**

Table 5.1 Protected Area-wise Forest Cover 2010 (Area in Km^2)

S.No.	Sanctuary	VDF	MDF	OF	Net Change	Scrub	NF	W B	Total
1	ETURNAGARAM	0.00	417.09	349.71	-0.86	23.80	75.95	4.11	870.66
2	GBM WLS	23.38	760.07	295.30	0.00	52.59	17.93	0.95	1150.22
3	KAMBALAKONDA WLS	0.00	26.19	37.97	-0.04	11.78	3.95	0.12	80.01
4	KAWAL WLS	48.26	332.03	300.58	-0.29	93.15	115.18	3.80	893.00
5	KBR NP	0.00	0.04	0.03	0.00	1.11	0.25	0.00	1.43
6	KINNERASANI WLS	1.54	227.90	287.65	-1.56	182.44	110.93	15.28	825.74
7	KOLLERU LAKE WLS	0.00	12.32	103.92	0.00	82.21	100.34	78.67	377.46
8	KORINGA WLS	12.87	89.26	13.99	0.00	1.91	6.23	125.56	249.82
9	RAYALA ELEPHANT RESERVE (INCLUDING KOUNDINYA WLS)	0.01	112.88	453.32	0.00	190.51	57.79	0.99	815.50
10	KRISHNA WLS	0.00	0.00	80.14	0.00	66.80	49.64	121.82	318.40
11	LANKAMALLESWARA	0.11	157.59	233.40	0.00	102.97	11.43	0.10	505.60
12	MAHAVIR HARINA VANASTHALI NP	0.00	0.18	0.49	-0.06	11.95	2.45	0.00	15.07
13	MANJEERA	0.00	2.40	5.52	0.00	5.35	2.89	10.72	26.88
14	CHILKUR MRUGAVANI NP	0.00	0.00	0.04	0.00	0.00	4.48	0.45	4.97
15	NELAPATTU WLS	0.00	0.03	5.05	0.00	1.20	3.22	0.07	9.57
16	NSTR	1.08	731.70	1970.38	0.00	1371.83	350.98	96.36	4522.33
17	PAKHAL WLS	0.00	145.35	402.34	-1.22	66.05	190.99	23.21	827.94
18	PAPIKONDA WLS	79.97	636.40	110.43	0.00	20.64	5.92	3.23	856.59
19	PENISULA WLS	0.00	84.35	798.92	-0.25	321.66	29.05	37.55	1271.53
20	POCHRAM WLS	38.19	82.89	13.38	0.00	7.63	0.13	0.16	142.38
21	PRANAHITA WLS	0.00	22.48	17.45	0.00	23.27	4.94	0.24	68.38
22	PULICAT LAKE	0.09	2.33	41.54	0.00	87.66	205.39	420.33	757.34
23	RAJIVGANDHI NP	0.00	0.00	0.30	0.00	1.81	1.71	0.00	3.82
24	ROLLAPADU WLS	0.00	0.00	0.01	0.00	0.04	5.16	0.00	5.21
25	SHIVARAM WLS	0.00	4.00	19.17	0.00	16.12	0.76	0.04	40.09
26	SRI VENKATESWARA WLS (Including SVNP)	2.87	80.02	366.73	-0.03	175.31	14.30	1.71	640.94
	Total	**208.37**	**3927.50**	**5907.76**	**-4.31**	**2919.79**	**1371.99**	**945.47**	**15280.88**

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

* Net Change in Forest Cover Only i.e., VDF, MDF and OF to Scrub and Non-Forest between 2009 and 2010.

Earth provides to enough to satisfy every man's need but not every man's greed.
- (Quotation Popularised by Gandhi)

Chapter - VI
FOREST COVER STATISTICS IN JOINT FOREST MANAGEMENT AREA

6.1 Introduction

Andhra Pradesh is one of the pioneering Forest Departments in India in implementing 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 proved effective in restoring forest cover in degraded forest lands and improved access to the forest resources by communities living in forest fringe areas. Considering the potential of the forests to contribute towards poverty alleviation the Government of Andhra Pradesh adopted a proactive stance by transforming JFM into CFM during 2002.

The difference between JFM and CFM is that while JFM uses participation of communities mainly for forest protection by giving them the rights to non-timber forest products (NTFP) and modest benefit-sharing in timber with limited involvement in forest management. Whereas CFM aims to improve forests both in coverage and productivity by empowering VSSs to take more autonomous decisions regarding the management and use the forest resources in livelihood development. This means a greater devolution of power and responsibilities to VSSs in planning, management and decision making on the forest areas marked for the VSSs, at the same time redefining roles of 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, as per the key strategy to address the use of forest resources for poverty alleviation.

6.2 Joint Forest Protection Committees (JFPCs)

There are 7,718 Vana Samrakshana Samities (VSSs) or JFPCs in the State. 15,200 Km^2 forest area, which constitutes 23.8 % of forest area, is under CFM. 15.39 lakh members are involved in CFM which includes 4.65 lakh members belonging to Scheduled Tribes and 3.23 lakh members belonging to Scheduled castes.

6.3 Forest Cover in VSS Areas

The forest cover in the VSS areas based on the interpretation of IRS P6 LISS III 2010 data is 9265.13 Km^2, which is 3.36% of the Geographical area. In terms of the forest canopy density classes the VSSs managed forests in the State consists of 76.78 Km^2 of Very Dense Forest, 3774.55 Km^2 of Moderately Dense Forest and 5402.92 Km^2 of Open Forest. The area of the Scrub is 3797.88 Km^2, Non-Forest is 2099.42 Km^2 and Water Bodies is 48.47 Km^2.

Comparison of the forest cover of 2010 with that of 2009 shows a net loss of 10.84 Km^2 of forest cover. It is seen that contribution of encroachments in the loss of forest cover in VSS areas is 9.57 Km^2.

Division wise forest cover in VSSs in different forest canopy density classes along with the changes compared to 2009 assessment is given in **Table 6.1.**

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

Chedwai (Kagaznagar), Abbugudem(Kothagudem), Manthur(Medak), Marlagudem(Eluru), Bandamcherla(Eluru), Kandrikagudem(Eluru), Narayanapur(Warangal North),Kammarigudem(Paloncha), Ragisettigudem(Paloncha), Rampuram(Kothagudem), Gajularamaram(Hyderabad), Potlavarigudem(Badrachalam South), Z.Veerabdraram(Badrachalam North), Singaram (Badrachalam North).

The 9 VSSs, where the forest cover was gained (VDF, MDF, OF, Scrub) are:

Vykuntapuram(Guntur), Pathangulagudem(Eluru), A.Durgapuram.S.T.colony(Kadapa), Komatipalli(Warangal North), Paluguthanda(Nagarjunasagar), Malonibavithanda(Nagarjunasagar) and Thippannapalli(Kothagudem).

Table 6.1.: Divisionwise Forest Cover in VSS areas 2010

(Area in Km^2)

S.No.	Division	VDF	MDF	OF	Net Change	Scrub	NF	WB	Total
ADILABAD CIRCLE									
1	Adilabad	1.1	112.21	157.53	-0.04	39.76	48.29	0.45	359.34
2	Bellampally	2.33	100.35	71.58	-0.18	13.17	19.08	0.41	206.92
3	JannaramWLM	1.67	56.81	55.91	0	3.95	2.41	1.28	122.03
4	Kagaznagar	3.95	62.46	51.33	-0.56	15.25	14.58	0.84	148.41
5	Mancherial	0.56	47.88	55.42	0	21.06	12.25	0.51	137.68
6	Nirmal	0.29	107.34	123.08	-0.14	29.37	21.74	0.68	282.5
	Total	9.9	487.05	514.85	-0.92	122.56	118.35	4.17	1256.88
ANANTHAPUR CIRCLE									
7	Anathapur	0	0.35	78.84	0	241.9	307.16	0.11	628.36
8	ChittoorWest	0	34.6	202.28	0	151.25	73.67	0.71	462.51
	Total	0	34.95	281.12	0	393.15	380.83	0.82	1090.87
GUNTUR CIRCLE									
9	Giddalur	0.15	10.11	35.54	0	114.67	123.49	3.12	287.08
10	Guntur	0	0	24.72	0	199.43	34.67	1.99	260.81
11	Nellore	0	6.6	123.48	-0.04	289.83	224.63	1.4	645.94
	Total	0.15	16.71	183.74	-0.04	603.93	382.79	6.51	1193.83
HYDERABAD CIRCLE									
12	Hyderabad	0	65.18	113.69	-0.67	161.76	11.83	1.03	353.49
13	Mahabubnagar	0	13.74	246.34	0	223.61	1.64	0.09	485.42
14	Nalgonda	0	0.21	23.31	0	134.05	55.86	0.32	213.75
	Total	0	79.13	383.34	-0.67	519.42	69.33	1.44	1052.66
KHAMMAM CIRCLE									
15	BhadrachalamNorth	0.01	30.49	43.49	-0.83	28.53	15.97	0.33	118.82
16	BhadrachalamSouth	0.9	35.13	36.43	-0.89	12.6	1.72	0.09	86.87
17	Khammam	0.1	47.72	95.75	-0.4	69.37	25.05	0.76	238.75
18	Kothagudem	0	26	103.26	-0.76	71.86	37.34	0.17	238.63
19	Paloncha	0.34	51.92	145.14	-2.73	64.72	21.98	0.16	284.25
20	PalonchaWLM	0.44	60.15	76.06	-0.63	41.4	19.16	2.13	199.33
	Total	1.79	251.41	500.13	-6.24	288.48	121.22	3.64	1166.65
KURNOOL CIRCLE									
21	Kadapa	0	11.21	180.7	-0.17	169.28	32.69	0.21	394.08
22	Kurnool	0	0.02	111	0	138.82	142.52	0.27	392.63
23	Nandyal	1.29	62.43	53.47	0	20.11	28.58	0.96	166.84
24	Proddatur	0	46.02	148.15	0	153.71	106.72	1.77	456.37
	Total	1.29	119.68	493.32	-0.17	481.92	310.51	3.21	1409.92
NIZAMABAD CIRCLE									
25	Kamareddy	0	83.48	177.43	0	34.65	28.81	1.28	325.65
26	Medak	0	69.29	361.11	-0.09	180.55	15.86	1.02	627.83
27	MedakWLM	0	20.57	22.62	0	4.03	2.96	0.03	50.21
28	Nizamabad	0	131.07	183.4	-0.2	46.62	41.76	2.54	405.39
	Total	0	304.41	744.56	-0.29	265.85	89.39	4.87	1409.08
RAJAMUNDRY CIRCLE									
29	Eluru	0.03	260.37	98.63	-1.01	27.64	27.82	0.06	414.55
30	Kakinada	61.19	905.32	88.96	-0.11	54.39	27.84	10.35	1148.05
31	Vijayawada	0	0.04	27.45	0	44.78	8.22	0.88	81.37
	Total	61.22	1165.73	215.04	-1.12	126.81	63.88	11.29	1643.97
FDPT SRISAILAM CIRCLE									
32	Achampet	0.01	42.35	102.64	0	83.94	4.42	3.6	236.96
33	Atmakur	0.02	8.3	30.13	0	19.34	76.4	1.12	135.31
34	MarkapurWLM	0.28	39.87	119.06	-0.02	135.23	52.5	0.21	347.15
35	Nagarjunasagar	0	2.88	44.66	0	106.66	21.87	0.15	176.22
	Total	0.31	93.4	296.49	-0.02	345.17	155.19	5.08	895.64
TIRUPATHI WLM CIRCLE									
36	ChittoorEast	0.02	17.2	321.75	0	142.07	86.49	0.17	567.7
37	Rajampet	0	4.29	131	0	117.2	36.36	0.08	288.93
38	TirupathiWLM	0.94	16.18	57.88	0	24.17	8.07	0.21	107.45
	Total	0.96	37.67	510.63	0	283.44	130.92	0.46	964.08
VIZAG CIRCLE									
39	Narsipatnam	0.87	99.31	95.69	0	20.28	14.98	0	231.13
40	Paderu	0.29	40.21	133.12	-0.02	59.73	46.46	0	279.81
41	Srikakulam	0	41.4	188.95	-0.06	41.61	15.72	2.54	290.22
42	Visakhapatnam	0	102.27	114.14	-0.04	35.3	20.02	0.22	271.95
43	Vizianagaram	0	172.44	114.93	-0.15	15.34	12.2	0.02	314.93
	Total	1.16	455.63	646.83	-0.27	172.26	109.38	2.78	1388.04
WARANGAL CIRCLE									
44	KarimnagarEast	0	382.61	171.36	-0.04	60.37	7.43	0.45	622.22
45	KarimnagarWest	0	120.28	118.21	0	83.8	10.13	1.3	333.72
46	WarangalNorth.	0	107.07	150.12	0.03	18.89	55.62	0.67	332.37
47	WarangalSouth	0	85.09	136.4	-0.82	28.7	88.1	1.19	339.47
48	WarangalWLM	0	33.74	56.85	-0.25	3.13	6.34	0.59	100.66
	Total	0	728.79	632.94	-1.08	194.89	167.62	4.2	1728.44
	Grand Total	**76.78**	**3774.55**	**5402.96**	**-10.84**	**3797.88**	**2099.42**	**48.47**	**15200.06**

** Net Change in Forest Cover Only, i.e. VDF, MDF and OF to Scrub and Non-Forest between year 2009 and 2010.*

CHAPTER - VII
FOREST FIRE IN ANDHRA PRADESH

7.1 INTRODUCTION

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 63,814 Km^2 of forest land under the control of Forest Department. Out of the above, excluding an area of about 350 Km^2 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. The ground fire or surface fire occurs between November and May in the state as seen from MODIS satellite images. March is the most susceptible month for the forest fires. The ground fire causes 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 24 percent of the compartments (of the total number about 18,000) are prone to fire damage to various degrees in the state leaving balance 76 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 occurrence in Andhra Pradesh is given in **Table 7.2**. The Division wise details of fire occurrence in various years in Andhra Pradesh are given in **Table 7.3**.

In all 13,835 fire incidents were reported in this period of 9 years. Thus on an average 1537 fire incidents take place annually in AP. A map of Andhra Pradesh showing forest fire occurrence between 2004 and 2011 is shown in **Fig 7.1.**

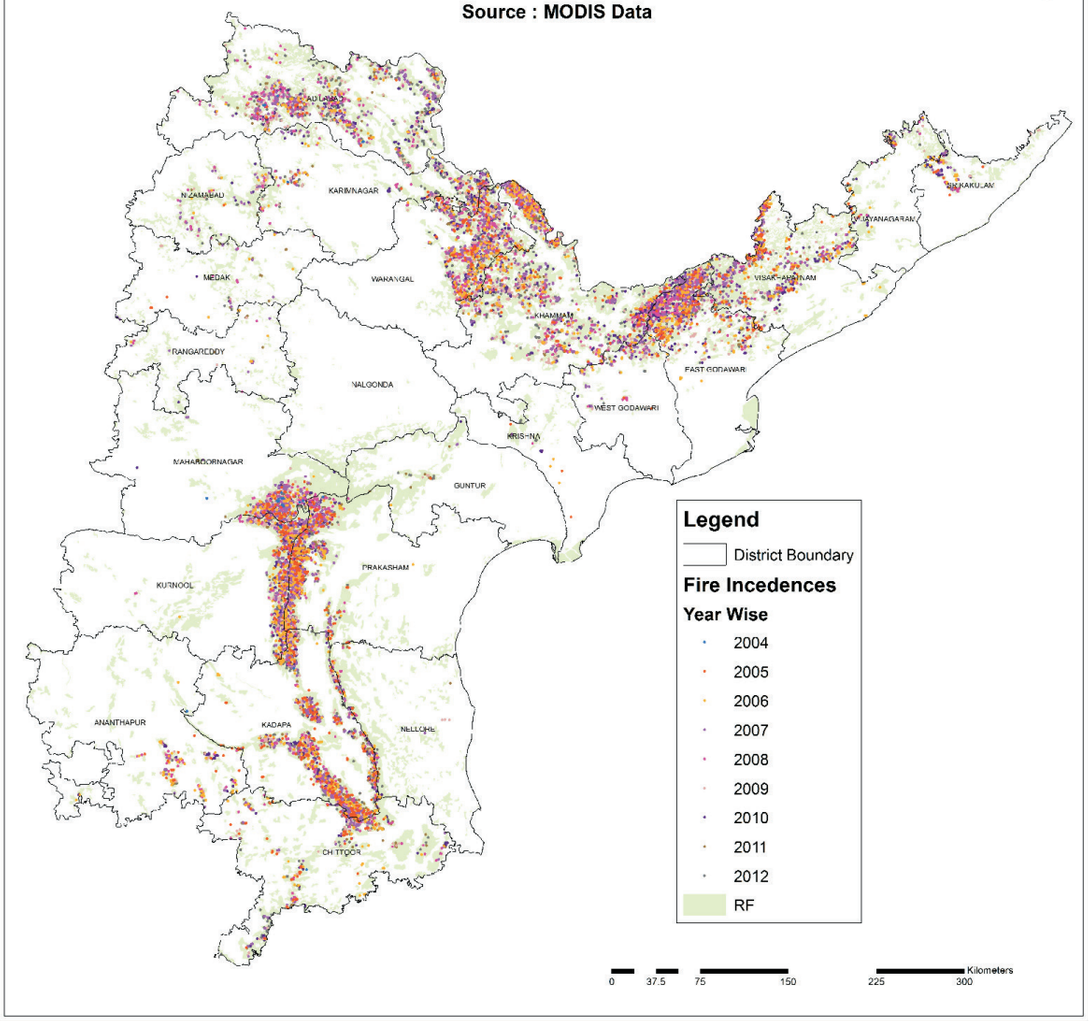
Table 7.1 :
Table showing the Number of Fire incidents observed through MODIS Data.

S.No	Year	Forest Fires
1.	2004	33
2.	2005	1084
3.	2006	1581
4.	2007	1929
5.	2008	1444
6.	2009	2454
7.	2010	1840
8.	2011	1113
9.	2012	2357
	Total	**13835**

(See Table. 7.4 for Month wise Distribution)

Fig No. 7.1 **MAP SHOWING LOCATIONS OF FIRE OCCURANCES IN ANDHRA PRADESH (2004-2012)**

Source : MODIS Data



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 fire affected areas in the State are Khammam, Visakhapatnam, Warangal and Rajmundry circles and parts of Srisailam Project Tiger area. The Boda grass (***Cymbopogon coloratus***) is the main cause of forest fires in NSTR and Rayalaseema region and the production of Tendu leaves (***Diospyros melanoxylon***) is major cause of forest fires in Telangana region. 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 by burning which may spread to adjoining forests.

7.3 FOREST FIRE PATTERN IN ANDHRA PRADESH

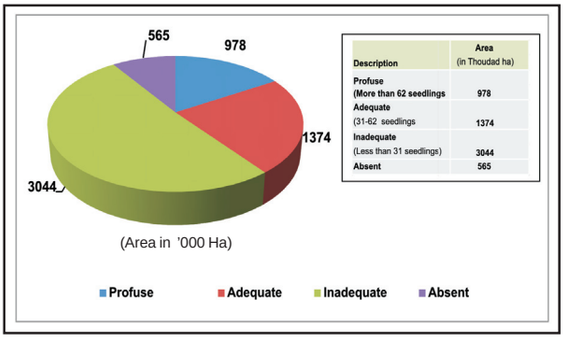
Andhra Pradesh has mostly dry deciduous forests and trees start drying up from January - February onwards. Rainy season is mostly by South-West monsoon from June to September except for little area in South East Andhra Pradesh covering Chittoor, Nellore and parts of Prakasham and Kadapa districts where North East monsoon comes between October and December. Because of this character, forest fire occurs in Post monsoon period when ground contain certain materials for burning. As analysed from MODIS data, maximum forest fire occurs in March followed by February and April. The distribution is shown in **Table 7.4** and corresponding graph is shown in **Fig 7.6**.

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; these 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 is exacerbated by a lack of fire protection planning knowledge and incentive.

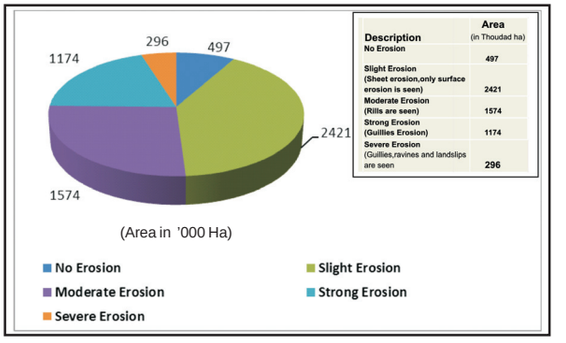
The following pie charts (**Fig 7.2, Fig 7.3**) show the effect of forest fire and grazing on status of regeneration and soil erosion in AP (Source: AP Forest Inventory report -2010).

Fig 7.2 : Status of Regeneration



Description	Area (in Thoudad ha)
Profuse (More than 62 seedlings	978
Adequate (31-62 seedlings	1374
Inadequate (Less than 31 seedlings)	3044
Absent	565

Fig 7.3 : Status of Soil Erosion



Description	Area (in Thoudad ha)
No Erosion	497
Slight Erosion (Sheet erosion,only surface erosion is seen)	2421
Moderate Erosion (Rills are seen)	1574
Strong Erosion (Guillies Erosion)	1174
Severe Erosion (Guillies,ravines and landslips are seen	296

Table 7.2 : Circlewise Fire Occurances in Andhra Pradesh

S.No	Circle	2004	2005	2006	2007	2008	2009	2010	2011	2012	Total
1	KHAMMAM	1	96	220	240	227	490	286	115	319	1994
2	FDPT SRISAILAM	15	175	182	298	211	307	202	173	313	1876
3	WARANGAL	2	119	197	198	224	359	253	86	352	1790
4	RAJAHMUNDRY	1	96	197	221	218	248	254	149	306	1690
5	KURNOOL	1	163	175	191	107	227	213	124	204	1405
6	VISAKAPATNAM	3	114	182	204	85	172	224	43	191	1218
7	TIRUPATI	0	145	141	185	91	178	113	205	159	1217
8	ADILABAD	5	27	70	156	142	270	142	71	309	1192
9	GUNTUR	0	93	137	151	76	130	106	99	130	922
10	ANANTHAPUR	3	51	59	47	37	45	35	31	53	361
11	NIZAMABAD	0	4	16	28	22	26	9	13	21	139
12	HYDERABAD	2	1	5	10	4	2	3	4	0	31
		33	**1084**	**1581**	**1929**	**1444**	**2454**	**1840**	**1113**	**2357**	**13835**

Table 7.3 : Divisionwise Fire Occurances in Andhra Pradesh

S.No	Circle	2004	2005	2006	2007	2008	2009	2010	2011	2012	Total
1	KAKINADA	1	85	178	189	199	214	228	141	279	1514
2	GIDDALUR	0	83	122	132	63	109	94	72	104	779
3	WARANGAL NORTH	0	60	92	91	91	155	107	47	131	774
4	ACHAMPET	12	52	59	124	89	128	49	52	141	706
5	RAJAMPET	0	83	71	92	62	93	64	105	102	672
6	BADRACHALAM NORTH	0	29	89	83	77	142	90	39	87	636
7	MARKAPUR	1	58	69	89	68	80	74	75	76	590
8	ATMAKUR	2	65	54	85	53	99	79	46	96	579
9	NARSIPATNAM	1	59	54	98	27	80	84	22	91	516
10	KADAPA	0	89	45	50	40	74	79	39	60	476
11	NANDYAL	0	24	73	75	35	80	81	35	68	471
12	PRODDUTUR	1	50	56	66	30	73	53	50	76	455
13	WLM TIRUPATI	0	52	55	80	19	73	33	82	42	436
14	KOTHAGUDEM	1	23	41	26	32	136	38	15	77	389
15	BADRACHALAM SOUTH	0	20	23	45	46	59	82	27	46	348
16	KARIMNAGAR EAST	1	15	13	22	27	60	66	6	108	318
17	WARANGAL SOUTH	0	22	44	30	41	73	27	12	55	304
18	NIRMAL	3	8	12	48	42	87	32	27	44	303
19	WLM WARANGAL	0	18	35	43	49	52	42	15	42	296
20	PADERU	1	27	49	45	20	30	49	10	44	275
21	PALONCHA	0	13	24	44	31	53	44	11	49	269
22	BELLAMPALLY	0	1	22	20	30	50	40	15	73	251
23	KHAMMAM	0	7	20	28	32	58	16	16	31	208

24	ANANTHAPUR	2	24	41	13	27	24	24	17	16	188
25	VISAKHAPATNAM	0	14	38	28	21	21	24	5	28	179
26	KAGAZNAGAR	0	6	8	40	7	35	16	6	59	177
27	MANCHERIAL	2	2	10	14	14	32	25	9	65	173
28	CHITTOOR WEST	1	27	18	34	10	21	11	14	37	173
29	JANNARAM	0	9	13	21	12	44	24	6	39	168
30	ELURU	0	7	16	31	18	34	23	8	23	160
31	WLM PALONCHA	0	4	23	14	9	42	16	7	29	144
32	VIZIANAGARAM	0	6	21	19	7	27	37	4	18	139
33	ADILABAD	0	1	5	13	37	22	5	8	29	120
34	NELLORE	0	9	13	18	13	16	10	21	19	119
35	SRIKAKULAM	1	8	20	14	10	14	30	2	10	109
36	CHITTOOR EAST	0	10	15	13	10	12	16	18	15	109
37	KARIMNAGAR WEST	1	4	13	12	16	19	11	6	16	98
38	KAMAREDDY	0	1	3	10	8	8	4	1	11	46
39	NIZAMABAD	0	0	6	11	8	14	2	3	1	45
40	MEDAK	0	3	7	5	5	4	3	8	8	43
41	GUNTUR	0	1	2	1	0	5	2	6	7	24
42	HYDERABAD	0	0	5	7	3	2	2	3	0	22
43	VIJAYAWADA	0	4	3	1	1	0	3	0	4	16
44	MAHABOOBNAGAR	2	1	0	3	1	0	1	1	0	9
45	WLM MEDAK	0	0	0	2	1	0	0	1	1	5
46	KURNOOL	0	0	1	0	2	0	0	0	0	3
47	WLM NSAGAR	0	0	0	0	1	0	0	0	0	1
48	NALGONDA	0	0	0	0	0	0	0	0	0	0
	Total	**33**	**1084**	**1581**	**1929**	**1444**	**2454**	**1840**	**1113**	**2357**	**13835**

During the year 2004 a Forest Fire Risk Zonation was carried out using satellite data taking into account certain parameters like Forest density, distance of habitation, Road, Slope, Aspect etc and maps were generated upto 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 Fire Risk Zonation map prepared and communicated based on MODIS data between 2004 and 2012, for the use of field officers, is shown in **Fig 7.4,** The Fire Risk Zonation map prepared based on MODIS data between 2004 and 2012 for Kakinada Division is shown in **Fig 7.5**.

Forest fire in Andhra Pradesh

Fig 7.4

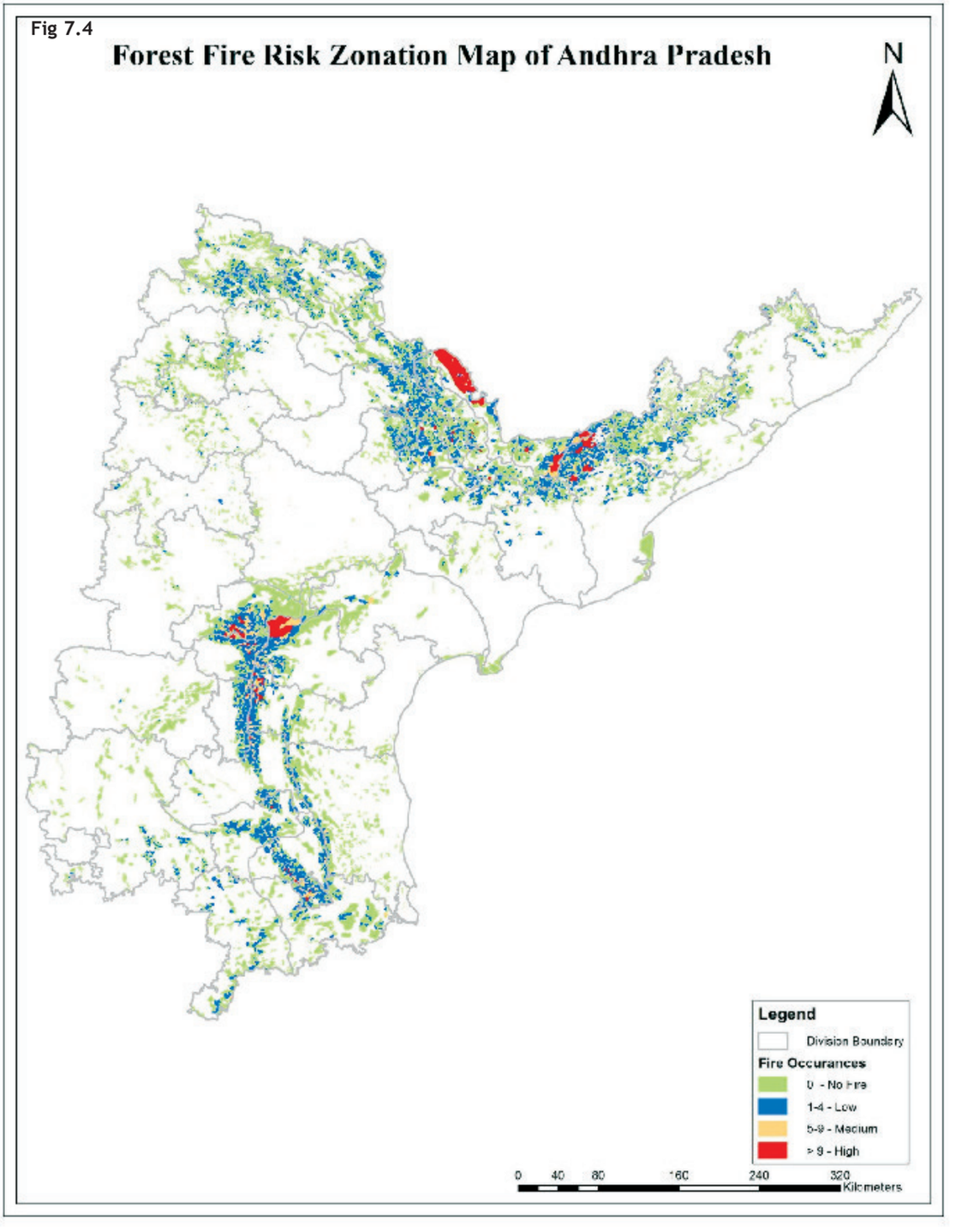


Fig 7.5

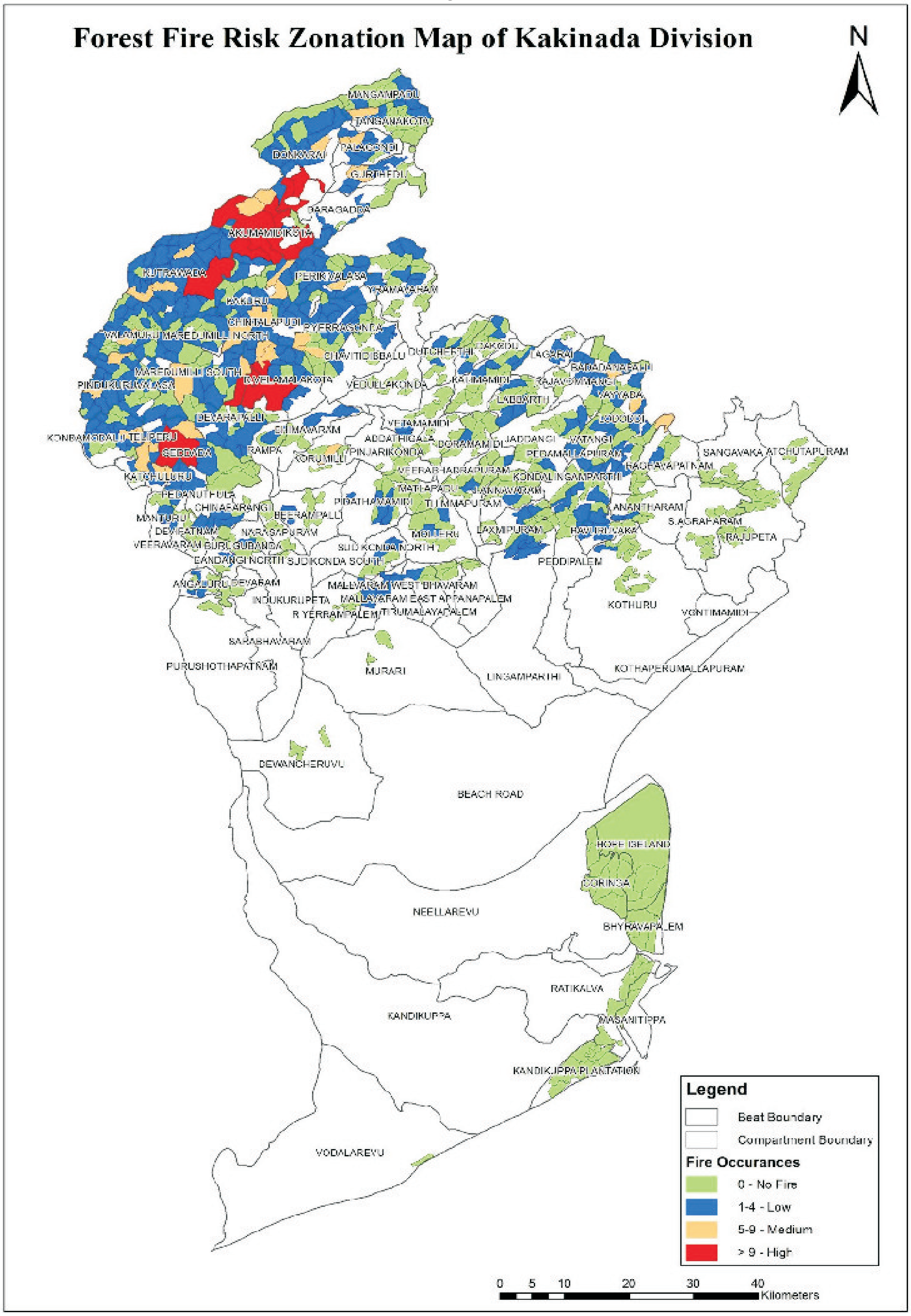
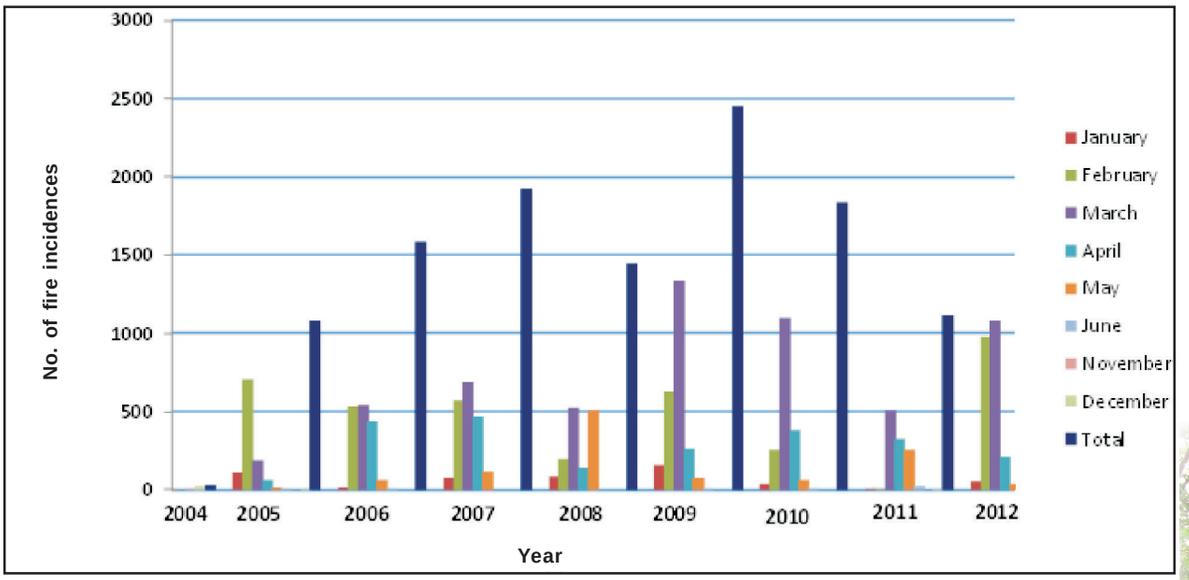

Forest Fire Risk Zonation Map of Kakinada Division
N
Legend
Beat Boundary
Compartment Boundary
Fire Occurances
0 - No Fire
1-4 - Low
5-9 - Medium
> 9 - High
0 5 10 20 30 40
Kilometers

Table 7.4. Month wise Distribution of fire occurances for the years 2004-2012

Month / Year	2004	2005	2006	2007	2008	2009	2010	2011	2012	Total
January	1	107	14	76	82	156	37	4	54	531
February	1	707	528	572	194	625	255	2	976	3860
March	0	192	540	695	521	1335	1100	508	1079	5970
April	2	61	435	466	141	263	378	326	212	2284
May	2	11	61	120	506	74	62	252	36	1124
June	0	5	3	0	0	1	8	19	0	36
November	3	0	0	0	0	0	0	0	0	3
December	24	1	0	0	0	0	0	2	0	27
Total	33	1084	1581	1929	1444	2454	1840	1113	2357	13835

Fig. 7.6 Month wise Distribution of fire occurances for the years 2004-2012



Protect wild animals from methods of hunting, trapping and fishing that cause extreme, prolonged, and avoidable suffering.
- Earth charter & Gandhi page 59

Glossary of Technical Terms

Allowable Error: A systemic error that is 'acceptable', both statistically and analytically. The amount of error that can be tolerated without invalidating the usefulness of the analytic result.

AWiFS: Advanced Wide Field Sensor

Band: A wavelength interval in the electromagnetic spectrum. For example, in IRS images the bands designate specific wavelength intervals at which images are acquired.

Calibration: Process of comparing an instrument's measurements with a standard.

Classification: Process of assigning individual pixels of an image to categories, generally on the basis of spectral reflectance characteristics.

Classification accuracy: The extent to which a manual or automatic processing system correctly identifies selected classes.

Color Composite Image: Color image prepared by projecting individual black-and-white multi-spectral images, each through a different color filter. When the projected images are superposed, a color composite image results.

Confidence Interval: A confidence interval (CI) is a particular kind of interval estimate of a population parameter. Confidence intervals are used to indicate the reliability of an estimate. How likely the interval is to contain the parameter is determined by the confidence level or confidence coefficient. Increasing the desired confidence level will widen the confidence interval, however the estimated value will be away from the absolute value.

Consumer's accuracy: It is a measure of the reliability of an output map generated from a classification scheme. It is a statistic that can tell the user of the map what percentage of a class corresponds to the ground-truthed class.

Contrast: The ratio between the energy emitted or reflected by an object and its immediate surroundings.

Contrast enhancement: Image-processing procedure that improves the contrast ratio of images. The original narrow range of digital values is expanded to utilize the full range of available digital values.

Contrast ratio: On an image, the ratio of reflectance's between the brightest and darkest parts of an image.

Contrast stretching: Expanding a measured range of digital numbers in an image to a larger range, to improve the contrast of the image and its component parts.

Density slicing: Process of converting the continuous gray tones of an image into a series of density intervals, or slices, each corresponding to a specific digital range. The density slices are then displayed either as uniform gray tones or as colors.

Digital Image Processing: Computer manipulation of the digital-number values of an image.

Digital Number (DN): Value assigned to a pixel in a digital image

Error Matrix: A matrix or table that displays statistics for assessing image classification accuracy by showing the degree of misclassification among classes.

Errors of Commission: Pixels incorrectly assigned to a particular class that actually belong in other classes.

Errors of Omission: Pixels incorrectly excluded from a particular class.

False color image: An image produced by displaying multiple spectral bands as colors different from the spectral range they were taken in. A color image where parts of the non-visible EM spectrum are expressed as one or more of the red, green, and blue components, so that the colors produced by the Earth's surface do not correspond to normal visual experience. Also called a false color composite (FCC). The most commonly seen false-color images display the very-near infrared as red, the red as green, and the green as blue.

Forest: Land with tree crown cover (or Equivalent stocking level) of more than 10 % and area of more than 0.5 ha. The trees should be able to reach a minimum height of 5 m at maturity in situ. May consist of either closed forest formations where trees of various storeys and undergrowth cover a high proportion of the ground, or open forest formations with a continuous vegetation cover, in which tree crown cover exceeds 10 %. Young natural stands and all plantations established for forestry purposes which have yet to reach above criteria are included under forest, as are areas normally forming part of the forest area which are temporarily un stocked as a result of human intervention or natural causes but which are expected to revert to forest.

Forest Canopy Density: Forest Canopy Density (FCD) refers to the proportion of an area in the field/ground that is covered by the crown of trees and is expressed in percentage of the total area.

Forest Type: Forest type is defined as a unit of vegetation which possess broad characteristics in physiognomy and structure sufficiently pronounced to permit its differentiation from other such units (Champion & Seth 1968)

Geographic Information System (GIS): A computer based system for capturing, storing, manipulating, analyzing and displaying data, which are spatially referenced to the earth.

Global Positioning System (GPS): The Global Positioning System (GPS) is a space-based global navigation satellite system. It provides reliable positioning, navigation, and timing services to worldwide users on a continuous basis in all weather, day and night, anywhere on or near the Earth which has an unobstructed view of four or more GPS satellites.

Good Forest and Degraded Forest: Good Forest includes VDF, MDF and OF; degraded forest includes Scrub and Non-Forest.

Green and Barren: Green includes VDF, MDF, OF and Scrub; Barren includes Non-Forest.

Ground control point (GCP): A geographic feature of known location that is recognizable on images and can be used to determine geometric corrections.

Ground truth: Information acquired by field study for the purpose of calibration and/or verification of remotely sensed data.

Geometric correction: Image-processing procedure that corrects spatial distortions in an image. The geographic correction of image data to conform to a map projection.

Histogram: A means of expressing the frequency of occurrence of values in a data set within a series of equal ranges/bins, the height of each bin representing the frequency at which values in the data set fall within the chosen range. A cumulative histogram expresses the frequency of all values falling within a bin and lower in the range. A smooth curve derived mathematically from a histogram is termed as probability density function (PDF).

Image: A pictorial representation acquired in any wavelength of the electromagnetic spectrum. Although image is a general term, it is commonly restricted to representations acquired by non-photographic methods.

Imagery: The products of image forming instruments.

Interpretation: The process in which a person extracts information from an image.

Interpretation key: Characteristic or combination of characteristics that enable an interpreter to identify an object on an image.

Kappa coefficient: A statistical measure of the agreement, beyond chance, between two maps (e.g. output map of classification and ground-truthed map). It is represented by the symbol kappa hat or Khat.

Mangroves : Salt tolerant ever green forest ecosystem found mainly in tropical and sub – tropical coastal and / or inter tidal regions.

Medium Dense Forest: All lands with forest cover having a canopy density between 70-40% Multi-spectral classification: Identification of terrain categories by digital processing of data acquired by multi-spectral scanners.

Multi-spectral scanner: Scanner system that simultaneously acquires images of the same scene at different wavelengths.

Mid-infrared (MIR): The range of EM wavelengths from 8 to 14 micrometers dominated by emission of thermally generated radiation from materials; also known as thermal infrared.

NDVI: The Normalized Difference Vegetation Index (NDVI) is defined as the ratio of the difference in the NIR & Red radiance values to the sum of the NIR & Red radiance values.

NDWI: The Normalized Difference Water Index (NDVI) is defined as the ratio of the difference in the SWIR and NIR radiance values to the sum of the SWIR and NIR radiance values.

Near infrared (NIR): The shorter wavelength range of the infrared region of the EM spectrum, from 0.7 to 2.5 m. It is often divided into very-near infrared (VNIR) covering the range accessible to photographic emulsions (0.7 to 1.0m), and the short wavelength infrared (SWIR) covering the remainder of the NIR atmospheric window from 1.0 to 2.5m.

Noise: Random or repetitive events that obscure or interfere with the desired information.

Open Forest: Lands with forest cover having a canopy density between 40 to 10%.

Overall accuracy: The percentage of correctly classified pixels. It is a good measure of the accuracy of a classification scheme as it is not biased towards the smaller classes.

Path and Row: Path is an approximate specific orbital track of a Satellite which may vary due to drift and other factors. Row refers to the latitudinal center line of a frame of imagery.

Pixel: Contraction of picture element

Producer's accuracy: A measure of the accuracy of a particular classification scheme. It shows what percentage of a particular ground class was correctly classified.

Protected Forest (PF): An area notified under the provisions of the Indian Forest Act or other State Forest Acts, having limited degree of protection. In protected forest all activities are permitted unless prohibited.

Radiometric correction: Calibration of recorded radiance values reflected from (or emitted by) the ground scene.

Radiometric Resolution: The expected spread of variation in each estimate of scene reflectivity as observed in an image. Smaller radiometric resolution is "better". Radiometric resolution for a given image may be improved by averaging, but at the cost of spatial resolution.

Raster format: A means of representing spatial data in the from of a grid of DN, each line of which can be used to modulate the lines of a video raster.

Ratio image: An image prepared by processing digital multi-spectral data as follows: for each pixel, the value for one band is divided by that of another. The resulting digital values are displayed as an image.

Remote sensing: Collection and interpretation of information about an object with an instrument without being in physical contact with the object.

Reserved Forests (RF): An area so constituted under the provisions of the Indian Forest Act or other State Forest Acts, having full degree of protection. In Reserved forests all activities are prohibited unless permitted.

SAVI: Soil-Adjusted Vegetation Index. A vegetation index that accounts for, and minimizes, the effect of soil background conditions.

Scene: As the satellite moves along its path, the observatory instruments are continuously scanning the terrain below. The instrument signals are transmitted to Earth and correlated with telemetry ephemeris data to form individual framed images. During this process, the continuous data are segmented into individual frames of data known as scenes

Scrub: Degraded forest lands having canopy density less than 10% and areas with dwarf and stunted growth.

Spatial resolution: Ability to separate closely spaced objects on an image or photograph. A measure of the smallest angular or linear separation between two objects usually expressed in radians or meters.

Spectral resolution: The ability of a sensing system to resolve or differentiate electromagnetic radiations of different frequencies.

Standard Deviation and Variance: In probability theory and statistics, the variance of a random variable or distribution is the expected, or mean, value of the square of the deviation of that variable from its expected value or mean. Thus the variance is a measure of the amount of variation within the values of that variable, taking account of all possible values and their probabilities or weightings (not just the extremes which give the range). The standard deviation of a statistical population, a data set, or a probability distribution is the square root of its variance. Standard deviation is a widely used measure of the variability or dispersion.

Statistic: A statistic is a single measure of some attribute of a sample (e.g. its arithmetic mean value). It is calculated by applying a function (Statistical algorithm) to the values of the items comprising the sample which are know together as a set of data. A Statistic as a function of a sample where the function itself is independent of the sample's distribution; that is, the function can be stated before realization of the data. The term statistic is used both for the function and for the value of the function on a given sample.

Stereo pair: Two overlapping images or photographs that may be viewed stereoscopically.

Supervised classification: Digital-information extraction technique in which the operator provides training-site information that the computer uses to assign pixels to categories

Tone: Each distinguishable shade of gray from white to black on an image

Training area: A sample of the Earth's surface with known properties; the statistics of the imaged data within the area are used to determine decision boundaries in classification.

Training site: Area of terrain with known properties or characteristics that is used in supervised classification.

Tree: A woody perennial with a single main stem, or in the case of coppice with several stems, having a more or less definite crown, having diameter 10 cm or more at breast height (1.37m). If there are stems below 1.37 m height then individual branch/stem which has attained 10 cm DBH will be considered as individual tree. It also includes bamboo, palms, coconut, neem, peepal, fruit trees etc.

Unsupervised classification: Digital information extraction technique in which the computer assigns pixels to categories with no instructions from the operator.

Vegetation Canopy: The layers of vegetation above the level of the ground, formed by the leaves of the plants.

Very Dense Forest: All lands with forest cover having a canopy density more than 70%

Visible radiation: Energy at wavelengths from 0.4 to 0.7mm that is detectable by the human eye.

SEATTLE CHIEF'S LETTER TO ALL

(Written in 1852 to US President)

"The President in Washington sends word that he wishes to buy our land. But how can you buy or sell the sky? the land? The idea is strange to us. If we do not own the freshness of the air and the sparkle of the water, how can you buy them?

Every part of the earth is sacred to my people. Every shining pine needle, every sandy shore, every mist in the dark woods, every meadow, every humming insect; all are holy in the memory and experience of my people.

We know the sap which courses through the trees as we know the blood that courses through our veins. We are part of the earth and it is part of us. The perfumed flowers are our sisters. The bear, the deer, the great eagle, these are our brothers. The rocky crests, the dew in the meadow, the body heat of the pony, and man all belong to the same family.

The shining water that moves in the streams and rivers is not just water, but the blood of our ancestors. If we sell you our land, you must remember that it is sacred. Each glossy reflection in the clear waters of the lakes tells of events and memories in the life of my people. The water's murmur is the voice of my father's father.

The rivers are our brothers. They quench our thirst. They carry our canoes and feed our children. So you must give the rivers the kindness that you would give any brother.

If we sell you our land, remember that the air is precious to us, that the air shares its spirit with all the life that it supports. The wind that gave our grandfather his first breath also received his last sigh. The wind also gives our children the spirit of life. So if we sell our land, you must keep it apart and sacred, as a place where man can go to taste the wind that is sweetened by the meadow flowers.

Will you teach your children what we have taught our children? That the earth is our mother? What befalls the earth befalls all the sons of the earth.

This we know: the earth does not belong to man, man belongs to the earth. All things are connected like the blood that unites us all. Man did not weave the web of life, he is merely a strand in it. Whatever he does to the web, he does to himself.

One thing we know: our God is also your God. The earth is precious to him and to harm the earth is to heap contempt on its creator.

Your destiny is a mystery to us. What will happen when the buffalo are all slaughtered? The wild horses tamed? What will happen when the secret corners of the forest are heavy with the scent of many men and the view of the ripe hills is blotted with talking wires? Where will the thicket be? Gone! Where will the eagle be? Gone! And what is to say goodbye to the swift pony and then hunt? The end of living and the beginning of survival.

When the last red man has vanished with this wilderness and his memory is only the shadow of a cloud moving across the prairie, will these shores and forests still be here? Will there be any of the spirit of my people left?

We love this earth as a new born loves its mother's heartbeat. So, if we sell you our land, love it as we have loved it. Care for it, as we have cared for it. Hold in your mind the memory of the land as it is when you receive it. Preserve the land for all children, and love it, as God loves us.

As we are part of the land, you too are part of the land. This earth is precious to us. It is also precious to you.

One thing we know - there is only one God. No man, be he Red man or White man, can be apart. We ARE all brothers after all."